CRD summary
The authors concluded that photoselective vaporisation was as effective and safe as transurethral resection of the prostate, for patients with benign prostatic hyperplasia, particularly if their prostate was smaller than 70mL. Overall, the review was well conducted and the results for the primary outcomes are probably reliable, but the reliability of those for the secondary outcomes is uncertain.

Authors' objectives
To evaluate the efficacy and safety of photoselective vaporisation versus transurethral resection of the prostate, for patients with benign prostatic hyperplasia.

Searching
PubMed, EMBASE, The Cochrane Library, Science Citation Index, and CBM were searched for studies in any language, from database inception to 2011; search terms were provided. References of included studies were searched to identify additional relevant studies.

Study selection
Randomised controlled trials (RCTs) and non-randomised controlled trials that compared photoselective vaporisation and transurethral resection, in patients with benign prostatic hyperplasia, were eligible for inclusion. The primary outcomes of interest were the maximum urinary flow rate, International Prostate Symptom Score (IPSS), post-void residual urine, and quality of life. Secondary outcomes were operative time, hospital time, catheter removal time, and complications, including but not limited to transfusion and capsular perforation.

In all, but two, of the included trials, the patients had prostates smaller than 70mL. Their mean age ranged from 61.7 to 84.3 years, across treatment groups and trials. Two trials used a low-powered 60W laser, six used a medium-powered 80W laser, and two used a high-powered 120W laser.

Two reviewers independently selected the trials for inclusion.

Assessment of study quality
The quality of the RCTs was evaluated using the Cochrane Collaboration tool. This covered sequence generation, allocation concealment, blinding, incomplete outcome data, selective reporting of outcomes, and other possible sources of bias. The quality of the non-randomised trials was assessed using a modified Newcastle-Ottawa Scale, where scores between 5 and 9 were defined as high, and scores below 5 were defined as low.

Quality was assessed by two independent reviewers, with any disagreements resolved by consultation with a third reviewer.

Data extraction
Data were extracted from each study to calculate a mean difference (for continuous data) or a relative risk (for dichotomous data), with 95% confidence interval. Trial authors were contacted where data were missing.

Two reviewers independently extracted the data.

Methods of synthesis
The data were pooled in a random-effects meta-analysis. Relative risks were pooled using the Mantel-Haenszel method, and mean differences were pooled using inverse variance. Heterogeneity was assessed using $X^2$ and $I^2$. Subgroup analyses were conducted by study design (RCTs versus non-randomised trials), and by the size of the patient's prostate.

Results of the review
Eleven trials were included in the review, with 1,398 patients. Six were RCTs (over 500 patients) and five were non-
randomised trials (about 900 patients). It appears that five RCTs were at a low risk of bias, and one was at a high risk of bias. All five non-randomised trials were considered to be of high quality.

There were no statistically significant differences, between photoselective vaporisation and transurethral resection of the prostate, for maximum urinary flow rate (six trials), IPSS (five trials), or quality of life (three trials) at any time period, for patients with a prostate smaller than 70mL, or larger than 70mL. The only difference between groups was post-void residual urine at three months, in patients with a prostate smaller than 70mL (MD -4.71, 95% CI -7.30 to -2.12; three trials; \( I^2=0 \)).

Photoselective vaporisation had a statistically significant, longer operation time, than transurethral resection (seven trials; 1,084 patients), but hospital time was shorter (seven trials; 1,069 patients), and catheter removal time was shorter (eight trials; 1,088 patients). The results were presented separately for patients with a prostate smaller or larger than 70mL, and the results were similar.

Ten trials reported complications. In patients with a prostate smaller than 70mL, the pooled meta-analyses showed that there were fewer transfusions (RR 0.10, 95% CI 0.03 to 0.28), capsular perforations (RR 0.08, 95% CI 0.02 to 0.29),, and clot retentions (RR 0.13, 95% CI 0.05 to 0.31), following photoselective vaporisation, than after transurethral resection. There were no differences in urinary retention, urinary tract infection, re-intervention, retrograde ejaculation, urethral stricture, urinary incontinence, bladder neck contracture, and dysuria. For prostates larger than 70mL, the pooled meta-analyses showed no differences.

Authors' conclusions
Photoselective vaporisation was as effective and safe as transurethral resection of the prostate, for benign prostatic hyperplasia, at the mid-term patient follow-up, particularly if the prostate was smaller than 70mL.

CRD commentary
The review question and inclusion criteria were clear. The authors searched a number of databases for publications in any language. It was not clear if unpublished data were sought, so some relevant trials may have been missed. Two independent reviewers were involved in all aspects of the review process, limiting reviewer error and bias. A formal quality assessment was made, using a valid tool, and most trials appeared to be of good quality. This review combined randomised trial data with non-randomised evidence, which could lead to biased results. This is of concern for the secondary outcomes, and analyses of prostates larger than 70mL, where the results were statistically significant, but there was considerable heterogeneity. The reliability of these results is uncertain.

The results for the primary outcomes, where there were no differences between treatments and no statistical variation, are probably reliable.

Implications of the review for practice and research
Practice: The authors stated that photoselective vaporisation was an option for benign prostatic hyperplasia, at the mid-term patient follow-up, especially for patients with prostates smaller than 70mL.

Research: The authors stated that photoselective vaporisation and transurethral resection of the prostate had the same efficiency, but long-term follow-up after 24 months was required. They also stated that more high-quality, large-sample, long-term RCTs were needed to compare high wattage, with lower wattage laser treatment.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.