



Title **Surgical Procedures and Non-Surgical Devices for the Management of Non-Apnoeic Snoring: A Systematic Review of Clinical Effects and Associated Treatment Costs**

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Aim

To review the evidence on the clinical effects and associated treatment costs of surgical procedures and nonsurgical devices in managing nonapneic snoring.

Conclusions and results

This study highlighted the paucity and poor quality of the evidence available on the effects of both surgical procedures and nonsurgical devices in managing primary snoring. Hence, any conclusions to be drawn from the results are tentative. No procedure was clearly the least-cost option. The systematic review included 27 studies (3 randomized controlled trials, 2 controlled clinical trials, and 22 pre-post studies) reported in 30 publications assessing uvulopalatopharyngoplasty (UP₃) versus laser-assisted uvulopalatoplasty (LAUP), UP₃ alone, LAUP alone, palatal stiffening techniques (Pillar implants and injection snoreplasty), radiofrequency ablation (RFA) of the soft palate or tongue base, continuous positive airway pressure (CPAP) devices, and mandibular advancement splints (MAS). Studies were generally of low methodological quality with small sample sizes. In total, 1191 patients were included. Both UP₃ and LAUP reduced the number of snores per hour and produced a modest reduction in snoring loudness. UP₃ was effective in reducing several subjectively reported snoring indices, but results on objective measures were equivocal. Limited evidence indicates that subjectively assessed snoring is improved after LAUP; no objective measures were assessed. RFA was associated with a reduction in partner-assessed snoring intensity; evidence for an objective reduction in snoring sound levels was mixed. Pillar implants were moderately effective at reducing partner-rated snoring intensity, but had no effect on objective snoring indices. Use of CPAP reduced the number of snores per hour; no subjective measures were evaluated. Use of MAS improved objective snoring outcomes, including the maximal snoring sound volume, the mean snoring sound volume, and the percentage of time spent in loud snoring; no subjective measures were evaluated. The cost for UP₃ ranges from approximately 1230 pounds

sterling (GBP) to approximately GBP 1550. For LAUP the cost varies from GBP 790 to GBP 2070 depending on the number of stages of the procedure. Treatment costs associated with the use of Pillar implants range from GBP 1110 to GBP 1160. The approximate annual treatment costs associated with using a CPAP machine and MAS are GBP 220 and GBP 130 respectively.

Recommendations

No consistent significant differences appear in effects between UP₃ compared with LAUP on snoring levels. UP₃, LAUP, RFA of the soft palate, and Pillar implants are associated with a significant reduction in patient- or bed partner-reported snoring levels. However, the rate of relapse on subjectively assessed outcomes is variable and ranges from approximately 6% to 24%, depending on the procedure and the length of postoperative follow-up. There is no strong evidence that subjectively assessed snoring outcomes are associated with objective reductions in snoring sound levels. Very limited evidence on CPAP and MAS shows that both devices are associated with a significant reduction in objective snoring sound parameters, which if realized may translate into a significant reduction in bed partner-assessed snoring intensity. In terms of UP₃, LAUP, and Pillar implants, no procedure is clearly the least-cost option based on the crude and limited analysis conducted. For use of CPAP or MAS, use of MAS appears cheaper than use of a CPAP machine.

Methods

See Executive Summary link at www.hta.ac.uk/project/1671.asp.

Further research/reviews required

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