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### **Cost-effectiveness of anti-retropulsion devices for ureteroscopic pneumatic lithotripsy.**

*E Olweny, B Eisner, M Stoller*

**Background:** The use of anti-retropulsion devices during ureteroscopic lithotripsy decreases stone migration and secondary procedures. These devices include the Stone Cone (Boston Scientific, Natick, MA), the Accordion Stone Management Device (PercSys, Palo Alto, CA), and the NTrap (Cook Urological, Bloomington, IN). We examined the cost-effectiveness of the use of these devices during ureteroscopic pneumatic lithotripsy.

**Methods:** A decision analytic model was created to simulate treatment. Outcome probabilities were derived from peer-reviewed literature (*Journal of Urology, Journal of Endourology, Urologia Internationalis*). Direct procedural costs were derived from institutional billing records. Decision analysis models were based on ureteroscopic pneumatic lithotripsy as primary treatment of ureteral stone and shock wave lithotripsy (ESWL) as salvage secondary procedure for retropulsed clinically significant residual stone fragments.

**Results:** Procedural and office costs for ureteroscopy with lithotripsy and ESWL were \$5580 and \$5191, respectively. Device costs averaged \$262 (range \$235 - \$295). Stone retropulsion requiring a second procedure was 15.6% for pneumatic lithotripsy without anti-retropulsion devices and 0.9% for pneumatic lithotripsy with anti-retropulsion devices. Decision analysis revealed that anti-retropulsion devices are cost-effective for use during pneumatic lithotripsy at a retropulsion rate of 14% or greater.

**Conclusion:** Anti-retropulsion devices are cost-effective at retropulsion rates of 14% or greater. Many reports of pneumatic lithotripsy report retropulsion rates far greater than this. Therefore, due to the high risk of retropulsion (and subsequent procedures) during pneumatic lithotripsy, use of anti-retropulsion devices can potentially reduce costs and secondary procedures, leading to improvements in patient care.

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