



Comparative Cost-Effectiveness of Percutaneous Nephrolithotomy, Ureteroscopy, and Extracorporeal Shock Wave Lithotripsy for the Management of 1-2cm Renal Stones

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Background

- Guidelines for treatment of renal stones 1-2 cm in size include URS, PCNL, and ESWL
- Recent meta-analysis found highest stone free rate with PCNL; however complication rates also highest with PCNL
- No cost-effectiveness analysis yet comparing modalities

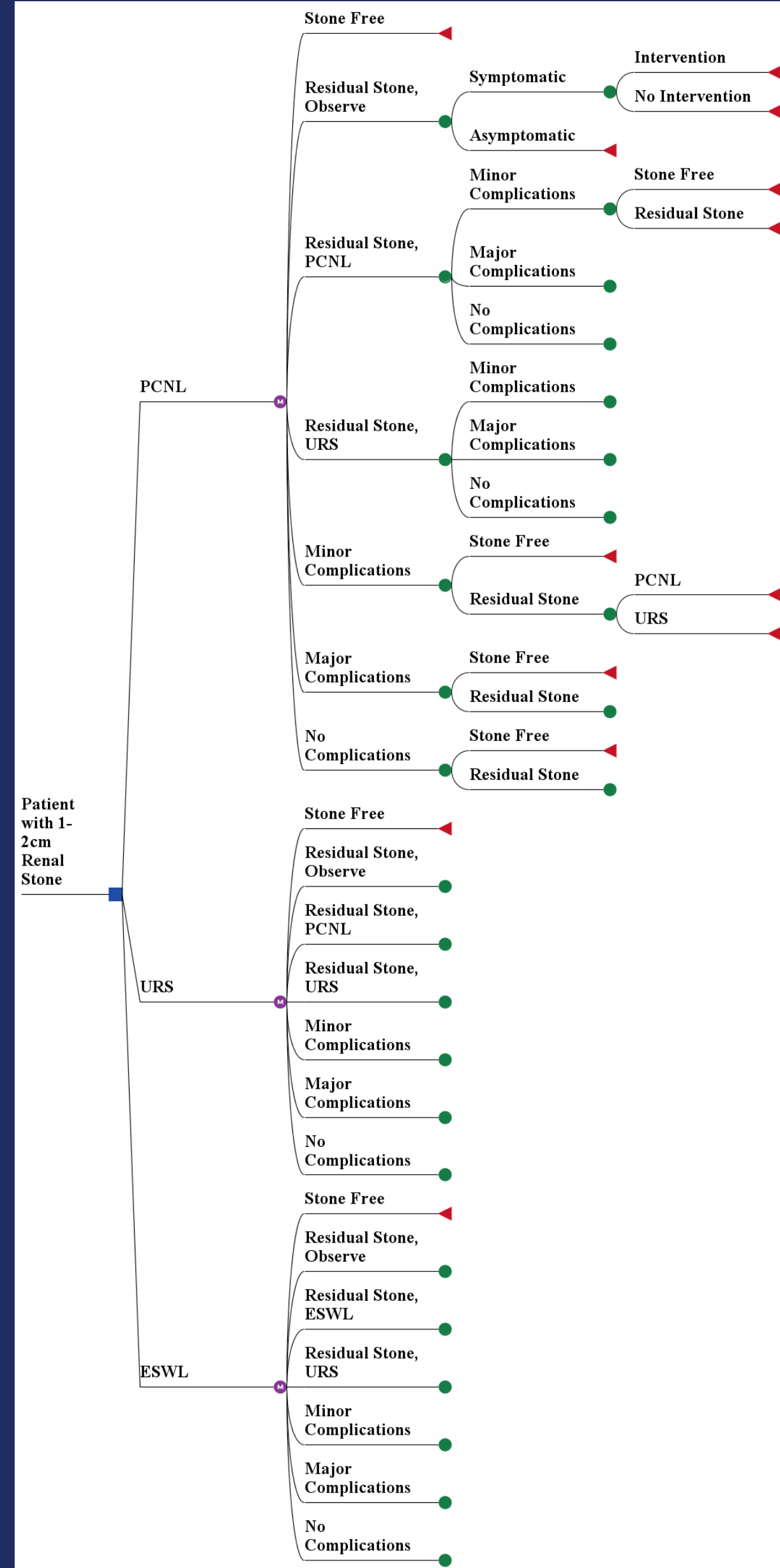
Objective

- To compare the cost-effectiveness of PCNL, URS, and ESWL for 1-2 cm renal stones

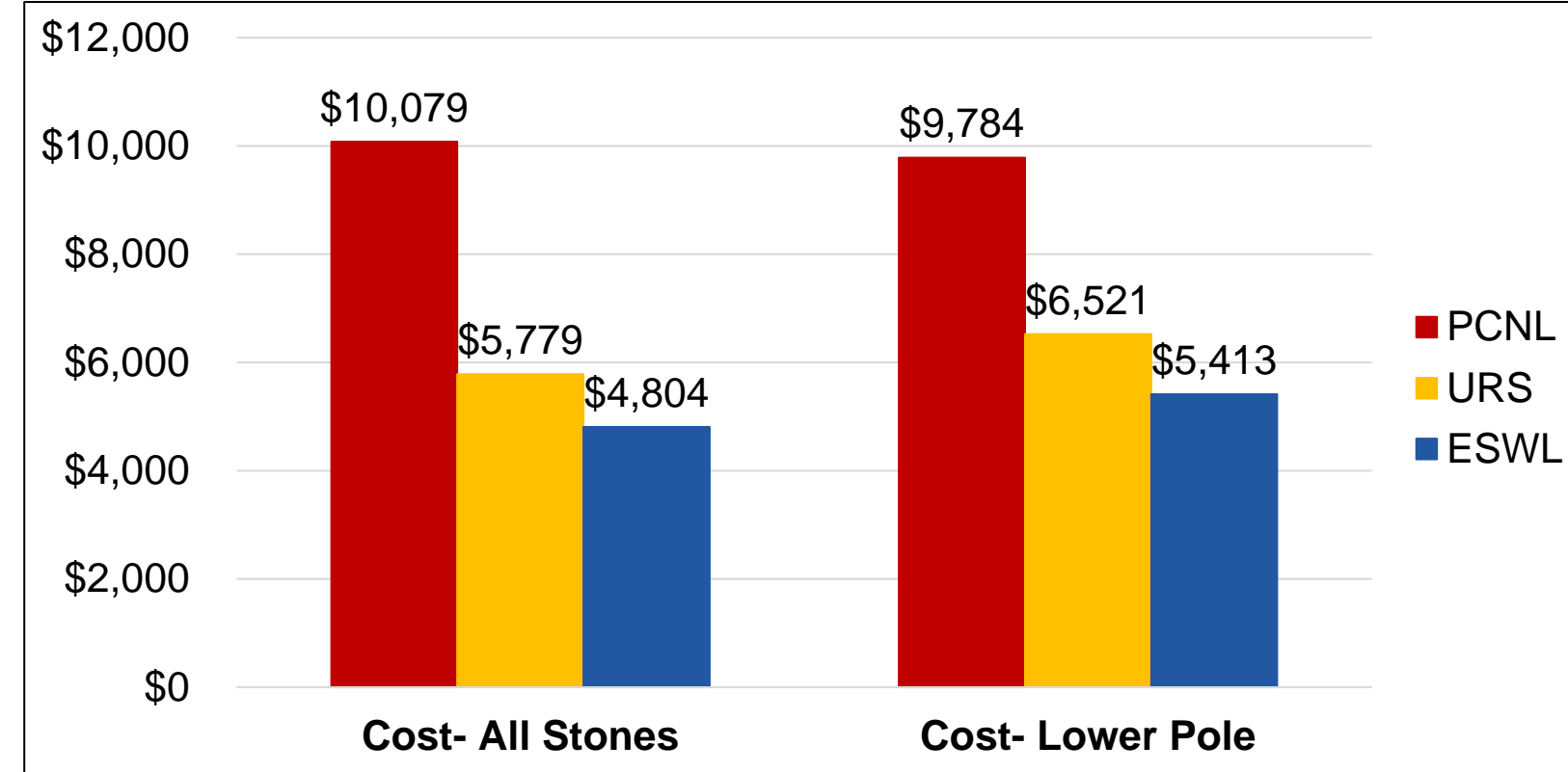
Methods

- Probabilities from meta-analysis:
 - Stone free rate
 - Minor and major complications
- Costs from US Medicare reimbursement
- Utility values from literature
- Markov model
- Cycled every 3 months x 3 years
- Univariable and multivariable sensitivity analyses

Model



Results



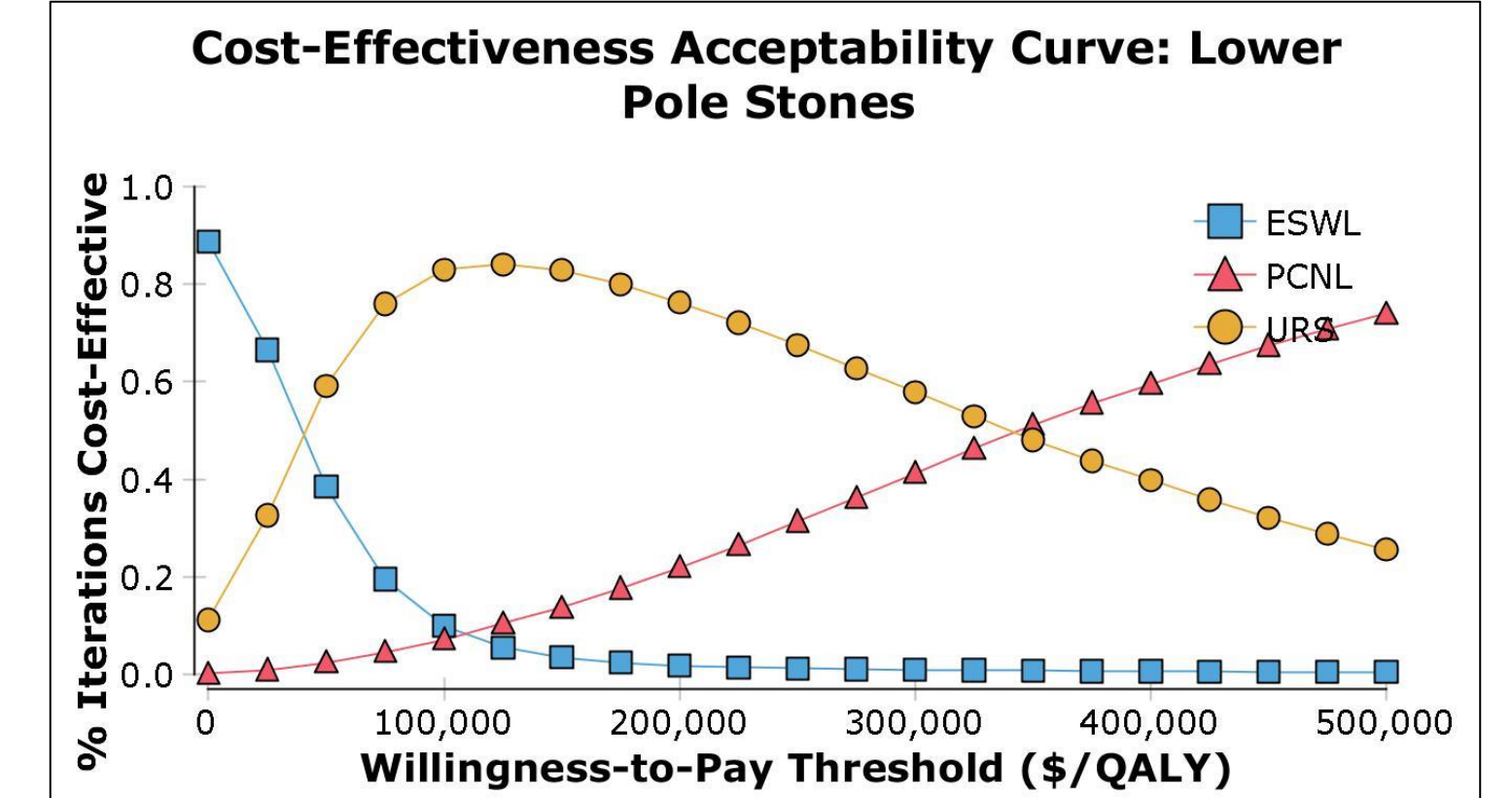
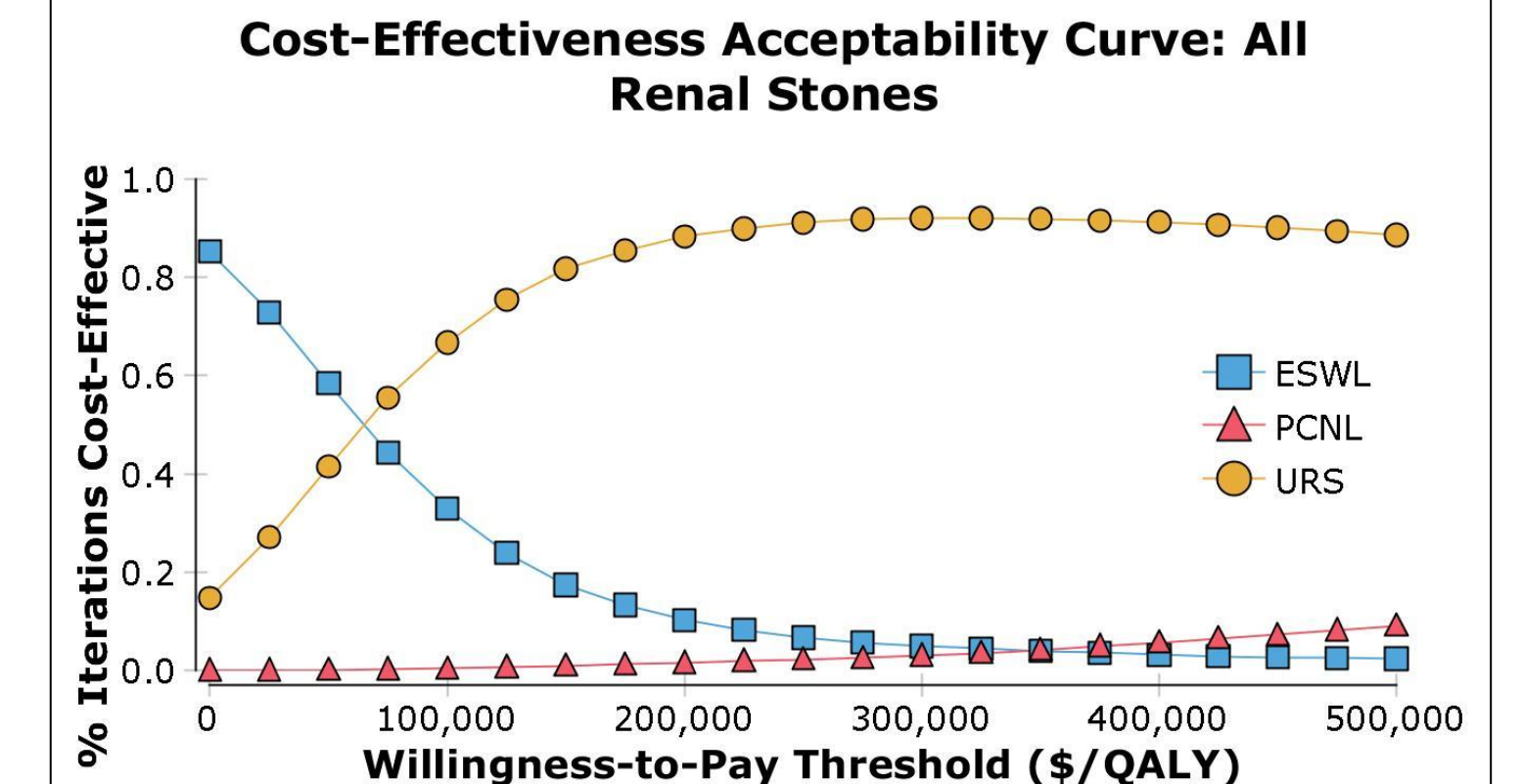
Management Option	QALYs All Stones	QALYs Lower Pole
ESWL	REFERENCE	REFERENCE
URS	+ 0.014	+ 0.028
PCNL	+ 0.017	+ 0.038

Management Option	ICER All Stones	ICER Lower Pole
ESWL	REFERENCE	REFERENCE
URS	\$67,257 / QALY	\$39,909 / QALY
PCNL	\$302,751 / QALY	\$115,650 / QALY

Univariable Sensitivity Analysis

Variable	Cut Point	Most CE
Baseline	---	URS
Cost of URS	≥\$5,080	ESWL
Cost of PCNL	≤\$5,205	PCNL
Probability URS Stone Free	≤0.82	ESWL
	≤0.62	PCNL
Utility value of Stone	≥0.925	ESWL

Multivariable Sensitivity Analysis



Conclusions

- For 1-2cm stones, URS most cost-effective on population level due to intermediate costs and stone free rates
- PCNL is most costly but also most effective and becomes increasingly cost-effective for lower pole stones at higher WTP thresholds
- Most CE modality dependent upon stone free rates and cost