INTRODUCTION

- Previous studies have demonstrated that use of a dedicated radiofrequency (RF) transseptal puncture (TSP) device (NRG® Transseptal Needle, Baylis Medical) is associated with reductions in transseptal complications, failures to cross the septum and transseptal access time, as compared to use of a mechanical transseptal needle (BRK, Abbott).

- While the upfront cost of the RF TSP device is more than the mechanical needle, the cost-effectiveness of the two options has not previously been evaluated.

METHODS

- A decision tree was prepared to evaluate the cost-effectiveness of the RF TSP device and the mechanical needle, as used during pulmonary vein isolation (PVI) procedures, in three different clinical scenarios: single TSP with one device (base case); double TSP with one device; and, double TSP with two devices.

- Probability and clinical cost inputs were located in peer-reviewed literature and healthcare databases, while costs of TSP materials were obtained from the University of California, San Francisco EP lab.

- The total cost at 30 days was the sum of PVI procedure costs and costs of TSP-related complications.

- Effectiveness was defined as probability of survival at day 30 following TSP success.

RESULTS

- The cost-effectiveness rankings of the four scenarios are shown in Table 1.

- In all scenarios the RF TSP device was found to be dominant, as compared to the mechanical needle.

- The probabilistic sensitivity analysis and CEAC found that the RF TSP device was more cost-effective at any willingness-to-pay threshold.

DISCUSSION & CONCLUSIONS

- When all costs are accounted for, the RF TSP device is less costly and more effective than the mechanical needle, despite a greater upfront equipment cost.

- The modified base case analysis suggested that the shorter time-to-transseptal with the RF TSP device may further increase cost savings, which may enable faster lab turnover and more efficient use of personnel and space.

- It is noted that variations in procedural and equipment costs between centers could influence the level of dominance or cost-effectiveness reported.

Table 1. Cost-Effectiveness of RF TSP device compared to mechanical needle

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Incremental Total Cost at 30 Days for RF TSP device ($)</th>
<th>Incremental Effectiveness at 30 Days for RF TSP Device (%)</th>
<th>ICER**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single TSP with 1 device (base case)</td>
<td>-41</td>
<td>+0.9</td>
<td>Dominant</td>
</tr>
<tr>
<td>Double TSP with 1 device</td>
<td>-338</td>
<td>+1.1</td>
<td>Dominant</td>
</tr>
<tr>
<td>Double TSP with 2 devices</td>
<td>-158</td>
<td>+1.1</td>
<td>Dominant</td>
</tr>
<tr>
<td>Single TSP with 1 device (modified base case, with PVI costs adjusted for transseptal time savings)</td>
<td>-774</td>
<td>+0.9</td>
<td>Dominant</td>
</tr>
</tbody>
</table>

*As compared to mechanical transseptal needle
**The term “Dominant” indicates a device was associated with higher effectiveness and lower cost