# **Budget Impact of a Minimally Invasive Surgical Treatment for Benign Prostatic Hyperplasia in Australian Public Hospitals**



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### Background

- Benign prostatic hyperplasia (BPH) is a progressive, non-malignant prostate enlargement that affects 20% of Australian men aged ≥40 years.
- BPH is associated with lower urinary tract symptoms and erectile dysfunction significantly affecting quality of life.<sup>2</sup>
- · Men with BPH are more likely to experience depression and suicidal ideation due to the psychological, emotional and sexual effects of BPH symptoms, which lead to reduced productivity.34
- Effective and efficient BPH treatment is imperative for sustainable employment, especially as retirement age rises.<sup>5,6</sup>
- Transurethral resection of the prostate (TURP) is considered the gold standard for BPH in Australia accounting for 61% of BPH surgeries.7 The temporary implanted nitinol device (iTind), is a minimally invasive surgical treatment administered under local anaesthesia by a urologist
- in an outpatient clinic, office or hospital to treat BPH effectively and efficiently.8
- The iTind procedure uses a temporary nitinol device to reshape the prostatic urethra without tissue removal (surgical or thermal).<sup>8</sup> Patients can be discharged on the same day after the 10-minute procedure.8
- The patient returns for complete removal of the iTind after five to seven days of home recuperation.8 • It is ideal for men who fit the criteria for treatment with iTind and want an alternative to prescription medicines and invasive surgery.9-11
- Given the ageing population, high prevalence of chronic disease, healthcare workforce shortages, and extended waiting lists for elective surgery, offering iTind in an outpatient setting in public hospitals, to the right patient at the right time, may help address the long waitlist for TURP and the associated prolonged hospitals stays due to catheterisation, and catheter-associated infections. <sup>12-16</sup>

### Figure 1. Budget impact model structure



AE: adverse event; BPH: benign prostatic hyperplasia; HCP: healthcare professional; LUTS: lower urinary tract symptoms; TURP: transurethral resection of the prostate

# Figure 2. Disaggregated cost per procedure



# Objective

· To estimate the cost and resource impact of iTind as a minimally invasive treatment alternative to TURP for the treatment of BPH in Australian public hospitals

# Methods

#### Model Structure

- An Excel-based budget impact model was developed to estimate the economic impact of introducing iTind in the Australian public hospital outpatient setting. • The model compared two scenarios; a reference case where all patients received either bipolar or monopolar TURP, and a scenario where a proportion
- of patients received iTind rather than TURP (Figure 1). · Reference case data were based on an estimated cohort of 3643 BPH patients with BPH who had a TURP in Australian public hospitals.

### **Patient population**

- In the TURP scenario, all patients received either bipolar (4%) or monopolar (96%) TURP.<sup>17</sup>
- In the TURP and iTind scenario, it was assumed 10% of patients received iTind rather than TURP and this came from bipolar and monopolar procedures proportionally
- Inputs were based on available literature.

#### **Resource Use Inputs**

- · Modeled costs included the per procedure cost of consumables, pathology, healthcare professional (HCP) time, facility costs, and managing adverse events (AEs).
- Where available pathology HCP time facility costs and AF management costs were identified from a combination of sources including the IHACPA National Hospital Cost Data Collection (NHCDC) Public Sector report (2021-22) based on Australian Refined Diagnosis Related Groups (AR-DRG) codes, as well as grey literature.18
- The length of hospital stay with TURP, 2.56 days, was based on the average length of hospital stay for AR-DRG L05B8 in the AIHW National Hospital Morbidity Database (2017-18), 19
- · Consumables, HCP time, and AE management costs were extracted from the Prescribed List of Medical Devices and Human Tissue, relevant scientific and grey literature following a pragmatic literature search and inflation adjusted to 2024 values

#### Outputs

- · The primary model output was the total budget impact.
- · Secondary model outputs included budget impact per person, average total and disaggregated per procedure costs, and per procedure resource utilisation.

#### Sensitivity Analysis

A one-way sensitivity analysis, which varied each input by ± 20% to determine which variables had the greatest impact on model results, was performed.

- The total calculated costs of TURP and iTind procedures in Australian public hospitals were \$11, 908 and \$3,905, respectively (Figure 2; disaggregated per procedure costs also shown)
- Total budget impact of treating 10% (364) of patients with iTind rather than TURP was -\$ 2,915,366 (a 6.7% reduction in the total cost of care).

Time required per procedure

- Average budget impact per person was -\$800.
- In terms of resource utilisation (Figure 3), 372 hours of operating room time, 1905 hours of healthcare professional (urologists, anesthesiologists, nurses, and support staff) time, and 917 post-operative hospital bed days were saved in the scenario with iTind (8.7%, 7.4%, and 11.1% reductions, respectively).

## Figure 3. Disaggregated resource utilisation per procedure





AE: adverse event; TURP: transurethral resection of the prostate. Note that the relative size of each bubble proportionally reflects the cost of each disaggregated cost element. Pre-procedure components include pathology costs and healthcare professional time required ahead of the procedure. Procedure cost components include consumables, and HCP and facility costs for. Post-procedure cost components reflect only HCP and facility time required following the procedure. AE components represent the average cost of managing complications associated with each procedure.





AE: adverse event; TURP: transurethral resection of the prostate



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Pre-surgery consultation TURP Procedure length Recovery room iTind Hospital bed stay 8 9 10 0 2 3 5 6 Hours

TURP: transurethral resection of the prostate Note that the axis of this figure does not extend to show the full hospital bed stay incurred by patients receiving TURP (2.52 days).

#### Sensitivity Analysis

· The total budget impact was most sensitive to changes in the price of the iTind device, followed by the operating cost of hospital resources (operating room and hospital bed costs), and AE management (surgical retreatment rate and the cost of managing clot retention) (Figure 4).

#### Limitations

Patients

- The annual number of patients who received a TURP procedure in 2023 was estimated from the Medicare Benefit Schedule (MBS) item number 37203. The MBS schedule does not reflect procedures performed in public hospitals, however the 45 and up cohort study estimated that approximately 32% of all TURP procedures were performed in the public sector.<sup>20</sup>
- · Other patient groups (e.g., patients receiving medical therapy) that would benefit from an iTind procedure were excluded from this analysis.
- The model assumes that the iTind procedure was performed in an outpatient setting, but given there is no requirement for general anesthesia, the iTind procedure could be performed in an office setting.<sup>6</sup>
- The model utilised inputs and assumptions to estimate the budget impact from an Australian public hospital perspective, but the generalisability to specific hospitals with different costs or treatment options (e.g., no bipolar TURP or alternative MISTs offered) may differ.

#### Conclusions

 Compared to TURP, a MIST using a temporarily implanted nitinol device may enable Australian public hospitals to shorten waiting lists for eligible patients with BPH without compromising clinical outcomes or increasing costs. The healthcare resources saved (OR time, staff, and hospital beds) may also enable more patients with BPH to be treated.

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