

Budget Impact of an Ambulatory Minimally Invasive Surgical Treatment in an Italian Public Hospital

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Background

- Benign prostatic occlusion (BPO) is a progressive, non-malignant enlargement of the prostate that becomes increasingly common with age. This age-related rise in BPO is reflected clinically in the growing prevalence of lower urinary tract symptoms (LUTS), which affect a substantial proportion of men across all age groups. Currently, LUTS are observed in approximately 40% of men at age 50, increasing to 70% among men in their 60s and reaching as high as 80% in those over 70 and 80 years of age. In Italy alone, an estimated 2 million men are affected by benign prostatic obstruction (BPO), representing a 30% increase since 2000 and one of the highest prevalence rates in Europe. These figures place Italy among the countries most heavily burdened by the consequences of BPO. (2)
- Benign prostatic obstruction (BPO) represents a significant concern for society as a whole and for the healthcare system. The ageing population in Italy renders this condition an escalating challenge for the National Health Service (Servizio Sanitario Nazionale, SSN), not only because of the clinical impact of the disease and its related complications, but also due to the substantial costs associated with long-term symptom management and treatment. (1) Moreover, the increasing prevalence of BPO contributes to the persistent and growing waiting lists within the SSN, as the demand for specialist consultations, diagnostic assessments, and surgical interventions continues to exceed available resources. These delays in access to care may result in disease progression, reduced efficacy, and a further strain on healthcare infrastructure and personnel. From a societal standpoint, the incidence of BPO in men under 50 years of age should not be underestimated, as its impact on quality of life—particularly regarding occupational productivity, social functioning, and reproductive health—is often even more pronounced in this younger demographic.
- Beyond urinary obstruction and LUTS, BPO is strongly associated with erectile dysfunction and impaired quality of life. Men with BPH are at greater risk of depression and psychological distress due to the combined physical, emotional, and sexual burden of symptoms, which can also reduce workplace productivity and social participation.
- The need for effective treatment is particularly pressing in Italy, which has the oldest population in Europe: nearly 24% of Italians are aged 65 or older, and retirement age is steadily rising. (4, 5) These demographic trends highlight the importance of maintaining men's health, independence, and employability into later life. (6)
- The transurethral resection of the prostate (TURP) remains the gold standard surgical treatment for BPO in Italy, with excellent outcomes reported in 80–90% of patients. A proportion of patients, particularly those with smaller prostate volumes, are instead treated with transurethral incision of the prostate (TUIP), which offers comparable efficacy with reduced morbidity and shorter operative time. However, both TURP and TUIP require hospitalization, general or spinal anaesthesia, and substantial surgical resources. Waiting times in the public healthcare system can be prolonged—often 1 to 2 years—further delaying symptom relief and prolonging patient suffering. This situation is compounded by systemic pressures on Italian hospitals, including workforce shortages, high bed occupancy rates, and surgical backlogs. (2)
- In this context, minimally invasive surgical therapies (MISTs) such as the temporarily implanted nitinol device represent an innovative solution. The procedure is performed under local anaesthesia in an outpatient setting and does not involve tissue removal. The device is left in place for 5–7 days, gently reshaping the prostatic urethra, and is then removed in a brief follow-up visit. Patients can typically return home the same day, avoiding hospital admission. For selected men, the temporarily implanted nitinol device offers a safe and effective alternative to long-term medication and invasive surgery, with the potential to reduce waiting lists, hospital stays, and the risk of catheter-associated complications, while improving timely access to care.
- Despite the advancement of minimally invasive surgical therapies (MISTs), transurethral resection of the prostate (TURP) remains the gold standard for the surgical management of LUTS for patients either failing or refusing medical therapy. (3)
- The temporary implanted nitinol device (Olympus Corporation, Tokyo, Japan), which is placed into the prostatic urethra with the aim of reshaping the tissue of the prostatic urethra and the bladder neck, is a minimally invasive treatment option to deliver rapid and effective symptomatic relief from BPH symptoms. (4, 5)

Objective

- To estimate the cost and resource impact of shifting the temporary implanted nitinol device as a minimally invasive treatment alternative to transurethral incision of the prostate for the treatment of LUTS associated with BPO from inpatient to outpatient clinical practice.

Methods

- An Excel-based budget impact model with a 5-year time horizon and a public hospital perspective was developed to model the impact of converting a case mix of procedures in the operating room (OR) to a MIST in the outpatient setting. Either transurethral prostate incision (TUIP) or the temporary implanted nitinol device (temporary device) were performed in the OR, but only the temporary device was performed in outpatients. A public hospital perspective was adopted.

Model Structure

- The model compared two scenarios: i) a reference case where the temporary implanted nitinol device procedure is performed as a day surgery, and TUIP is performed as an inpatient surgery; ii) a projected future scenario where the temporary implanted device procedure substitutes the TUIP surgery and all procedures are carried out in an outpatient setting.

Market Dynamics

- Similarly to TUIP, the temporary implantable nitinol device may be indicated for men with relatively small prostates and serves as a minimally invasive alternative to medical therapy or more invasive surgery.
- As the temporary implantable nitinol device offers advantages such as preservation of sexual function, shorter recovery, and outpatient applicability, it can capture the same patient pool traditionally managed with TUIP.
- With growing preference for less invasive, office-based procedures, the temporary implantable nitinol device may replace TUIP in practice, altering procedure volumes and reshaping the BPO treatment landscape.

Resource Use Inputs

- Modeled costs included per-procedure costs of consumables, pathology, healthcare professional time, facility costs
- Consumables and Healthcare Professional (HCP) time management costs were sourced from relevant Italian scientific literature and national health economic studies

Outputs

- The primary model output was the total budget impact.
- Resource utilization was also reported to describe the impact of converting a case mix of procedures in the OR to a MIST in the outpatient setting

Budget Impact Results

- In the current scenario, 45 temporary device procedures are performed as day surgeries, while 20 transurethral incisions of the prostate (TUIP) procedures are carried out as inpatient surgeries. This activity translates into a total OR usage of 59 hours, during which surgeons, anesthesiologists, and nursing staff are collectively engaged for 453 staff-hours. The overall hospital length of stay associated with these procedures amounts to 65 days, representing a substantial resource burden for the healthcare facility.
- In the projected future scenario, all 65 temporary device procedures are assumed to be performed in an outpatient (ambulatory) setting, thereby completely eliminating the need for OR use (100% reduction) and inpatient hospitalisation (100% reduction). This reallocation of activity results in a 21% reduction in total staff time, reflecting a more efficient utilisation of healthcare resources. Notably, more than 80 nursing hours would be freed up and could be redirected toward other surgical or patient care activities, contributing to overall workflow optimisation and improved capacity management within the hospital.
- From an economic perspective, shifting procedures from the OR and inpatient wards to the outpatient environment generates an estimated cost saving of approximately €16,000 over a five-year horizon. The main drivers of this saving are the reduction in facility and staffing costs and the avoidance of inpatient stays. These findings highlight the potential for efficiency gains and cost containment when adopting minimally invasive temporary device procedures within the Italian healthcare context.

Figure 1a. Hospital Cost

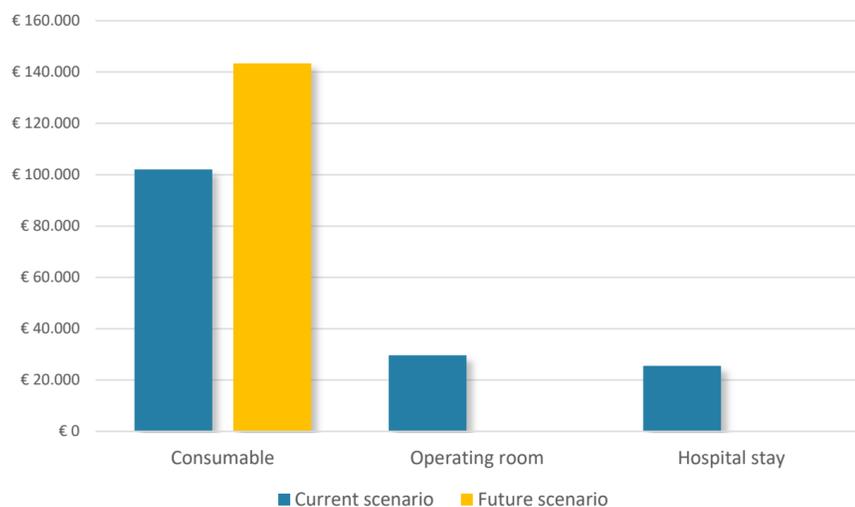


Figure 1b. Total cost reduction



Figure 2a. Hospital Resource Utilisation

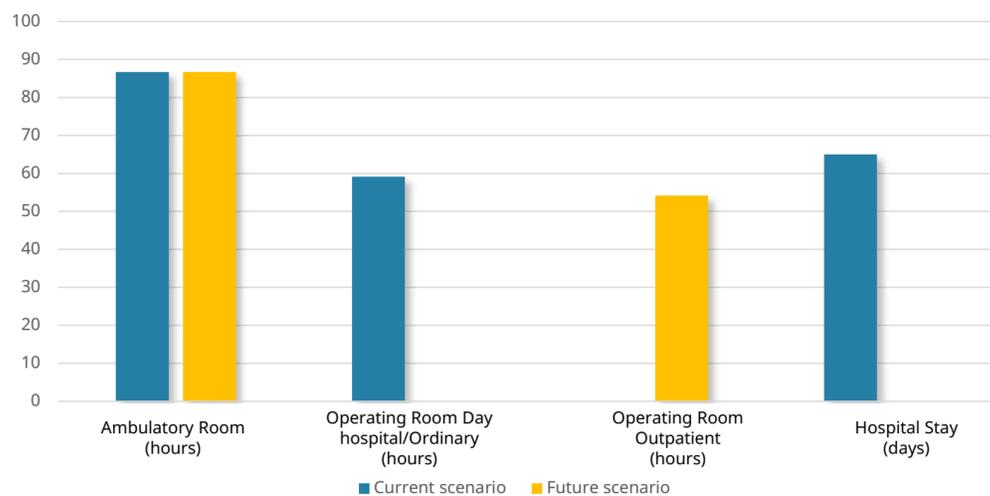
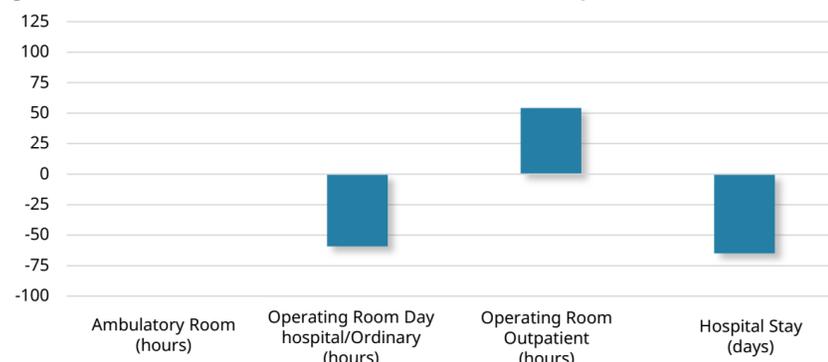


Figure 2b. Current Scenario Vs. Future Scenario: Delta Hospital Resource Utilisation



Conclusions

- Utilising the ambulatory setting to perform the temporary implanted nitinol device procedure, as an alternative to OR-based interventions such as transurethral incision of the prostate (TUIP) or the same procedure under general anaesthesia, offers a valuable opportunity to optimise hospital resources while continuing to treat patients with benign prostatic obstruction. By shifting these procedures from the OR to an outpatient environment, hospitals can free up surgical capacity, reduce staff time requirements, and eliminate the need for inpatient hospitalisation, all without compromising the quality or accessibility of care.
- This reorganisation of clinical practice supports the rational allocation of healthcare resources in a system facing increasing demand from an aging population and persistent surgical backlogs. The outpatient performance of the temporary implanted nitinol device not only shortens waiting times and improves patient throughput, but also generates direct cost savings, estimated at €25,200 over a five-year period in the modeled scenario. These economic benefits are primarily driven by reduced facility use, lower staffing needs, and the avoidance of inpatient stays.
- Beyond the financial implications, the shift toward outpatient management may also enhance patient experience, enabling faster recovery, earlier return to normal activities, and reduced exposure to hospital-related risks. Overall, adopting the temporary implanted nitinol device in an ambulatory setting represents a cost-effective and resource-efficient strategy that can contribute to sustainable urological care delivery within the Italian National Health Service (SSN).

Limitations

- The model retrospectively analysed a static cohort of patients who received a TUIP procedure, underestimating the burden of LUTS associated with BPO in Italy, which could be managed with the temporary implantable. Other patient groups (e.g., patients receiving medical therapy) that would benefit from a temporary implantable nitinol device procedure were excluded from this analysis.
- The model utilised inputs and assumptions to estimate the budget impact from the Italian third-party payer perspective; however, the generalizability to specific hospitals with different costs or treatment options may differ.

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