Costing statement: The TURis system for transurethral resection of the prostate (MTG23)

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1 Introduction

1.1 Transurethral resection in saline (TURis, Olympus Medical) is a bipolar electrosurgery system designed for use when surgical intervention is indicated for prostatic enlargement.

1.2 The TURis system can be purchased at any time although expert clinical opinion suggests it is more likely to be purchased when current monopolar systems have reached the end of their optimum working life. The age of current systems will be different in each acute hospital and therefore costs of implementation will vary depending on local circumstances. A costing statement has been produced to support the guidance.

1.3 Using the assumptions in the External Assessment Centre additional economic analysis, the guidance states:

- The case for adopting the TURis system (MTG23) for resection of the prostate is supported by the evidence. Using bipolar diathermy with TURis instead of a monopolar system avoids the risk of transurethral resection (TUR) syndrome and reduces the need for blood transfusion. It may also reduce the length of hospital stay and hospital readmissions.
- Using the TURis system instead of monopolar transurethral resection of the prostate (TURP) results in an estimated saving of £71 per patient for hospitals that already use an Olympus monopolar system and an estimated additional cost of £20 per patient for other hospitals. However, there is some evidence of a reduction in readmissions with the TURis system compared with monopolar TURP. If this evidence is included, using the TURis system results in an estimated saving of £375 per patient for
hospitals that already use an Olympus monopolar system and an estimated saving of £285 per patient for other hospitals.

1.4 If purchasing a TURis system, hospitals not using Olympus equipment will experience a greater cost impact than other hospitals due to the need to buy additional Olympus equipment. Consumable costs for TURis systems may vary in different settings because of negotiated procurement discounts.

1.5 When current systems need to be replaced, secondary care provider organisations will be expected to purchase new systems. If purchasing a TURis system, any additional costs will be offset by future savings from the avoidance of TUR syndrome, a reduction in the need for blood transfusions and a reduction in hospital stay and readmissions.

1.6 Commissioners for TURP procedures are clinical commissioning groups and providers are acute hospitals. This technology is anticipated to be cost saving, with the cost impact predominantly affecting provider organisations. There may be savings in the medium term for commissioners as the tariff should reduce in the future following on from a reduction in providers costs.

2 Background

2.1 TURis is a bipolar electrosurgical technique, and standard TURP is a monopolar electrosurgical technique. Electrosurgery delivers electrical energy from a generator unit to the operation site, to cut tissue or coagulate bleeding blood vessels.

2.2 In monopolar TURP, irrigation with a non-conductive fluid (glycine) is needed. Glycine is not isotonic with blood and may be absorbed by the body during surgery. This can lead to a rare, but potentially serious condition called TUR syndrome. With the TURis system
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saline is used; saline is near isotonic with blood and a claimed benefit of TURis is that the risk of TUR syndrome is eliminated.

3 Patient numbers affected

3.1 NICE’s guideline on lower urinary tract symptoms recommends active surveillance, self-management techniques or medical interventions if self-management is unsuccessful for diagnosing, monitoring and treating lower urinary tract symptoms (LUTS). Surgery is an option if drug treatment is unsuccessful or people are unable to tolerate drug treatment or have developed complications.

3.2 The surgical intervention most commonly used for LUTS is TURP. The Healthcare Resource Group (HRG) covering TURP, prostate transurethral resection procedure (LB25) national tariff 2014-15, is also expected to cover TURis. Therefore the guidance is not expected to have a significant cost impact for commissioners.

3.3 Hospital Episode Statistics data indicates there were approximately 13,600 TURP procedures carried out in 2012–13 (Health and Social Care Information Centre, 2013), equivalent to around 26 per 100,000 population. It is not known how many of these procedures were carried out using monopolar or bipolar systems.

4 Resource impact

Costs

4.1 The assumptions used by the External Assessment Centre results in overall savings ranging from £71 to £375 per patient for hospitals using Olympus monopolar systems. For other hospitals, when savings for a reduction in readmissions is included, results in an estimated savings of £285 per patient. Potential costs and savings for commissioners and providers are discussed in more detail below.
4.2 The economic evaluation underpinning the guidance assumed hospitals had an existing monopolar system. It did not compare purchase and use of the TURis system against purchase and use of monopolar systems. This costing statement therefore assumes the same baseline position, that is, hospitals have existing monopolar systems and so monopolar equipment costs are not considered.

4.3 Guidance implementation costs will vary depending if hospitals are already using Olympus systems. The company stated that between 40–45% of all UK hospitals already have access to a component of the Olympus system.

4.4 Hospitals already using the Olympus monopolar system will not need to purchase any of the common components to switch to the Olympus TURis system. The generator is not included in the capital equipment cost for any hospital because it will be provided free of charge as part of a sales package.

4.5 The economic model assumed that 3 sets of TURis equipment would be needed per hospital. These elements were assumed to have a mean working life of 7 years at 150 procedures a year. The total equipment costs for hospitals not using Olympus systems and hospitals that are using Olympus systems are shown in table 1.
Table 1 TURis equipment costs per hospital

<table>
<thead>
<tr>
<th>Components needed</th>
<th>Hospitals not using Olympus systems</th>
<th>Hospitals using Olympus systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost per unit (£)¹</td>
<td>Units required</td>
</tr>
<tr>
<td>Telescope</td>
<td>3,570</td>
<td>3</td>
</tr>
<tr>
<td>Light guide cable</td>
<td>415</td>
<td>3</td>
</tr>
<tr>
<td>Inner sheath</td>
<td>735</td>
<td>3</td>
</tr>
<tr>
<td>Outer sheath</td>
<td>1,225</td>
<td>3</td>
</tr>
<tr>
<td>Working element</td>
<td>2,755</td>
<td>3</td>
</tr>
<tr>
<td>Saline cable</td>
<td>205</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TURis capital cost (£)</th>
<th>Hospitals not using Olympus systems</th>
<th>Hospitals using Olympus systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£26,715</td>
<td>£8,880</td>
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</table>

TURis: transurethral resection in saline

4.6 Expert clinical opinion is that all monopolar TURP and TURis procedures involve the same consumables, a loop and a roller electrode. The company assumes that the consumables used during the procedure are all single use; however, it is assumed that a roller is used in approximately 22% of TURis procedures and 100% of monopolar TURP procedures. The consumable costs in hospitals using Olympus and non-Olympus monopolar TURP systems are compared in table 2.

Table 2 Consumable costs per patient

<table>
<thead>
<tr>
<th></th>
<th>TURis consumables (£)</th>
<th>Olympus monopolar TURP consumables (£)</th>
<th>Non-Olympus monopolar TURP consumables (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumable cost per patient</td>
<td>161</td>
<td>138</td>
<td>67</td>
</tr>
<tr>
<td>Additional cost of consumables if replaced by TURis systems</td>
<td>23</td>
<td>94</td>
<td></td>
</tr>
</tbody>
</table>

TURis: transurethral resection in saline, TURP: transurethral resection of the prostate

¹ Company’s submission of evidence (April 2014)
**Savings and benefits**

4.7 The potential savings associated with this technology are from reducing the risk of TUR syndrome that exists with monopolar TURP and reducing the need for blood transfusions. There may also be potential savings from a reduction in length of hospital stay and a reduction in readmission after surgery. In most situations these savings are expected to outweigh the additional equipment and consumables costs of the TURis system over monopolar systems.

4.8 Using the TURis system eliminates TUR syndrome, a rare but serious complication of prostate resection which can occur with monopolar electrosurgery. Severe forms of TUR syndrome can be life threatening. The treatment of TUR syndrome consists of general life support and treatment for hypotension, hyponatraemia and anuria (Hahn 1991).

The External Assessment Centre estimated that approximately 50 people must be treated with TURis (instead of monopolar TURP) to prevent 1 case of TUR syndrome.

If 13,600 procedures are carried out annually in England, approximately 270 people per year will be prevented from developing TUR syndromes by using TURis in all eligible cases, assuming all current procedures use monopolar systems. The company included a cost of £1,848 for TUR syndrome. If the TURis system prevented 270 procedures a year this would equate to a potential cost saving of around £500,000 for England, see table 3.

4.9 The TURis system has also been found to reduce the risk of postoperative blood transfusions. The External Assessment Centre estimated that approximately 20 people must be treated with TURis (instead of monopolar TURP) to prevent 1 blood transfusion.
If 13,600 procedures are carried out annually this signifies a potential reduction of approximately 680 people per year in England needing blood transfusions, assuming all current procedures use monopolar systems. The number of red blood cell units per transfusion is expected to be 2.7 units, representing a cost of £329 per transfusion. If 680 people no longer need a blood transfusion this could present a potential cost saving of around £224,000 for England, see table 3.

<table>
<thead>
<tr>
<th></th>
<th>Reduction in number of procedures per year</th>
<th>Average cost saving per patient (£)</th>
<th>Cost saving per 100,000 population</th>
<th>Cost saving per population of England (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUR syndrome</td>
<td>270</td>
<td>37</td>
<td>940</td>
<td>500,000</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>680</td>
<td>16</td>
<td>420</td>
<td>224,000</td>
</tr>
<tr>
<td><strong>Total savings</strong></td>
<td><strong>53</strong></td>
<td><strong>1,360</strong></td>
<td></td>
<td><strong>724,000</strong></td>
</tr>
</tbody>
</table>

TURis: transurethral resection in saline, TUR: transurethral resection syndrome

4.10 The External Assessment Centre also found some evidence that hospital length of stay is reduced by 0.19 days with TURis compared with monopolar systems. From a provider perspective this would represent a potential productivity saving, however, this is unlikely to represent a cost saving for commissioners. A reduction in bed days will either provide an opportunity to reduce infrastructure costs or enable an increase in throughput for providers.

An ordinary elective tariff for a prostate transurethral resection procedure (LB25) ranges from £1,681 to £2,626 (national tariff 2014-15). Each additional bed day for this HRG (for days exceeding trim point) is estimated to cost £202.

4.11 A study by Fagerstrom et al. (2011) shows evidence that, when the TURis system is used, there are fewer postoperative readmissions and faster postoperative recovery. However, there is variability in
the reporting of adverse events leading to readmission and there is poor reporting of rates of readmission.

The External Assessment Centre assumed a cost for readmission of £2,781, (HRG infection and mechanical problems related to genitourinary prostheses, implants and grafts with CC; reference costs 2012–13). The non-elective national tariff for this HRG is £1,798 (cost code LB20A, national tariff 2014-15). Reduced readmissions could therefore represent a significant saving to commissioners and potentially providers, however the results used were for readmissions for all causes and so the External Assessment Centre recommended that they should be treated with caution.

5 Conclusion

5.1 Expert clinical opinion is that the TURis system is as equally effective as the monopolar TURP system. The TURis system also has important clinical advantages, including reducing the risk of TUR syndrome and the need for blood transfusions. It may also reduce the length of stay in hospital and reduce readmissions.

5.2 Savings associated with these clinical advantages will outweigh the additional equipment and consumable costs associated with purchasing the TURis system in most cases. Using the assumptions in the External Assessment Centre’s additional economic analysis for hospitals already using monopolar TURP systems a saving of £71 per patient and an additional cost of £20 per patient for other hospitals is estimated.

5.3 If savings from reductions in readmissions is included, the TURis system results in an estimated saving of £375 per patient for hospitals already using Olympus monopolar systems and an estimated saving of £285 per patient for other hospitals.
5.4 The costs and potential savings of TURis systems should be investigated locally. This could be assessed when the monopolar TURP systems currently in use need replacing.
6 References


Health and Social Care Information Centre (2013) *Hospital Episode Statistics*