Optimising the use of bladder ultrasound scanners to improve the quality and safety of patient care and reduce costs

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1. Rationale for the project

• Urinary tract infection (UTI) is a leading cause of healthcare-associated infection in hospitals1. Approximately 60% of these infections are attributable to indwelling urinary catheters1, yet it is known that catheters are overused in hospitals2.

• Portable bladder ultrasound scanning offers a non-invasive, fast and painless alternative to bladder catheterisation for measuring urine volume in the bladder. It has been shown to significantly reduce catheter-associated UTI and increase patient comfort3, thereby improving care and reducing costs.

• In order to optimise scanner use at University Hospital Southampton NHS Foundation Trust (UHSFT) an economic assessment was undertaken to establish the best management and investment strategy for the future.

2. Method

• A detailed, monetised case study was undertaken in accordance with HM Treasury guidance (Figure 1).

• Cost avoidance analysis (Figure 2) was used to demonstrate avoided spend associated with bladder scanning. Data on actual use of bladder scanners during a one-month Trust-wide audit was used to inform the assessment.

• Cost consequence analysis (Figure 2) was used to compare the current, localised approach to the management of scanners with a proposed centralised approach using the Trust’s Medical Equipment Library (MEL).

3. Key findings

• Avoided spend was estimated to be in the region of £1,226,882 per year, based on preventing unnecessary catheterisation and UTI.

• Avoidance of treatment delays, extended hospital stay and UTI-attributed bacteraemia would result in additional cost efficiencies.

• The set up and running costs of a single scanner over 10 years was estimated to be £15,409 (see Figure 3).

• These costs would be met within 12 months (see Figure 4). Thereafter, significant cost efficiencies would be realised over the 8-10 year lifespan.

Figure 1: HM Treasury guidance requirements for an economic assessment

The costs:
• What is the true economic cost (i.e. direct and indirect)?
• What costs are incurred at set up and what are running costs?
• Who incurs what costs?

The benefits:
• Who benefits from what?
• What benefits can be attributed to the service?

Demonstrating impact:
• Establish additivity (i.e. we are adding value to what can normally be expected without the innovation)

Figure 2: Using different economic approaches

Cost avoidance analysis
• demonstrates the positive benefits from the perspective of negative outcomes avoided (e.g. catheterisation and UTI)

Cost consequence analysis
• compares the costs and benefits of alternative interventions to enable decision-makers to place their own emphasis on priorities

Figure 3: Set up & running costs - over 10 years

Figure 4: Avoided spend over 12 months

Figure 5: Stakeholder analysis

A stakeholder analysis ensured direct and indirect costs and benefits were identified in order to establish the true economic cost.

Figure 6: Pathways to outcomes

Use of a ‘Pathways to Outcomes’ model facilitated a whole system approach.

Figure 7: Summary of key requirements of the localised and centralised (MEL) approaches to management of portable bladder ultrasound scanners

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Localised approach</th>
<th>MEL approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>clarify about which wards use which scanner</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>running and repair costs spread between all users</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>located according to clinical need and frequency of use</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>set up to monitor use over time</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>scanner available for occasional use (e.g. clinic or training)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>single point of contact for clinical engineering department to coordinate maintenance and repair of scanners</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

• When comparing the costs and benefits of localised versus centralised management of the Trust’s fleet of bladder scanners, there were clear advantages to management within the MEL (see Figure 7).

4. Conclusions

• Bladder scanners improve the quality and safety of patient care and reduce costs.

• This economic assessment demonstrated significant avoided spend associated with scanner use and identified the key benefits to patients, staff and a hospital NHS Foundation Trust.

• There is a compelling case for a centralised approach to management of bladder scanners to ensure resources are better allocated.

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