Audit

An audit of the cost effectiveness of protocol-driven versus surgeon-directed pre-operative assessment of NHS patients referred to a General Surgeon

S D Woolley, L Walsh, A W Lambert

Abstract

Aims
Pre-operative assessment (POA) is now commonplace and follows established protocols. This audit compares the cost-effectiveness of surgeon-directed (SD) POA compared to the standard practice of protocol-driven (PD) POA.

Methods
One hundred and fifty-six NHS patients who were referred to a single surgeon during 2009 were allocated to one of three groups. Group 1: SDPOA required no investigations, whereas the PDPOA would have mandated only Methycillin-Resistant *Staphylococcus aureus* (MRSA) screening and urinalysis; Group 2: SDPOA required no pre-operative investigations, whereas the PDPOA would have required investigations to be performed; Group 3: SDPOA recommended selective investigations, PDPOA required additional tests. For each group the investigations requested and performed, their cost and whether the results affected patient care were recorded. There is no individual PDPOA group, but the cost of the extra tests was calculated where the PDPOA protocols were followed and therefore the cost differed between the SDPOA and PDPOA.

Results
The total cost for all investigations for the 156 patients was £43,985. A potential cost saving of £9,694 (group 2) and £8,898 (group 3) was demonstrated. The total potential saving identified for all 3 groups was £18,592, which was 42% of the total cost of all the investigations. Patient care was not affected by these additional investigations.

Conclusions
There were no observed peri-operative complications during the study, implying that the additional pre-operative investigations were clinically unnecessary and identifying an additional cost saving of £18,592.

Introduction
It is now standard practice for surgical patients to attend a clinic for Pre-Operative Assessment (POA). POA is carried out according to a set protocol developed following collaboration between the National Institute for Clinical Excellence (NICE) and the Association of Anaesthetists of Great Britain (AAGBI) (1, 2). Studies have investigated the comparison between Junior Doctors and Specialist Nurses following the protocol and their cost effectiveness (3, 4), but to date there are no studies comparing Surgeon-Directed POA (SDPOA) with Protocol-Driven POA (PDPOA). The senior author considered that the now-standard practice of PDPOA resulted in a large number of unnecessary investigations being performed, and as such wasted a large

<table>
<thead>
<tr>
<th>Test</th>
<th>Cost of Test (£)</th>
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<tbody>
<tr>
<td>Full Blood Count</td>
<td>72</td>
</tr>
<tr>
<td>Urea &amp; Electrolytes</td>
<td>66</td>
</tr>
<tr>
<td>Liver Function</td>
<td>66</td>
</tr>
<tr>
<td>Group and Save</td>
<td>170</td>
</tr>
<tr>
<td>Chest X-Ray</td>
<td>104</td>
</tr>
<tr>
<td>ECG</td>
<td>36</td>
</tr>
<tr>
<td>Echocardiogram</td>
<td>306</td>
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<tr>
<td>MRSA Swab</td>
<td>93</td>
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<tr>
<td>Stool Culture</td>
<td>66</td>
</tr>
<tr>
<td>OGD/Colonoscopy</td>
<td>1779</td>
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<td>USS</td>
<td>383</td>
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<tr>
<td>Urinalysis</td>
<td>28</td>
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</table>

*Table 1. Investigation costs (Nuffield Health Plymouth, 2009)*
sum of money. The authors have investigated the cost
difference and effectiveness of SDPOA practice compared
to the standard practice of PDPOA with regard to the
number and relevance of investigations requested, the cost
of the tests and the peri-operative outcome.

Method
156 NHS patients who were referred to a single Consultant
General Surgeon (senior author) for the management of
conditions such as lipomas, gall-stones and hernias
between 1 January and 31 December 2009 were included in
this retrospective study. At the time of the initial outpatient
consultation, the surgeon indicated what he believed to be
appropriate investigations for that patient. Each patient
then visited a nurse-led POA clinic and investigations were
performed according to guidelines (1,2).

The tests suggested by the surgeon, tests actually
performed, the results of the tests performed and peri-
operative problems encountered were recorded. An adverse
outcome was defined as anything that would cause any
intra- or post-operative problem that could not have been
predicted prior to surgery and which would result in harm
to that patient. The cost of each investigation was obtained
from the hospital management (table 1) and patients were
divided into 3 groups (table 2).

The predictive cost of SDPOA tests was calculated and
subtracted from the actual costs to give the potential saving.
Hospital costs, nursing and patient time was not included in
this study.

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<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Tests under SDPOA</th>
<th>No. of Tests under PDPOA</th>
<th>Cost of SDPOA Tests (£)</th>
<th>Cost of PDPOA Tests (£)</th>
<th>Potential Saving (£)</th>
<th>Adverse Outcomes</th>
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<tbody>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>2</td>
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<td>145</td>
<td>0</td>
<td>9694</td>
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<tr>
<td>3</td>
<td>161</td>
<td>243</td>
<td>25393</td>
<td>8898</td>
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<tr>
<td>Total</td>
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<td>388</td>
<td>25393</td>
<td>18592</td>
<td>18592</td>
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</tbody>
</table>

Table 2. The three study groups

Group 1: SDPOA required no investigations, PDPOA required MRSA screening and urinalysis
Group 2: SDPOA required no pre-operative investigations, PDPOA required investigations to be performed
Group 3: SDPOA recommended selective investigations, PDPOA required additional tests

<table>
<thead>
<tr>
<th>Types of Procedure</th>
<th>Number of Cases</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hernia Repair</td>
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<td>43</td>
<td>19</td>
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<td>Laparoscopic Cholecystectomy</td>
<td>0</td>
<td>1</td>
<td>28</td>
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<td>Vasectomy</td>
<td>24</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cyst/Lipoma Removal</td>
<td>12</td>
<td>10</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>60</td>
<td>48</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Number of procedures per group

Results
156 patients were included in the study. There were 94 men
and 62 women with a mean age of 46 years (range 19 – 68
years). The operative procedures to be performed were
elective operations with a low Surgical Severity Score (SSS)
(1,2) and the patients identified an American Society
of Anaesthetists (ASA) score of 1 or 2 (1,2). The surgical
procedures in each group are recorded in table 3.

For patients in Group 2 (n=60), the surgeon required no
tests to be performed, but the PDPOA required some tests
to be performed. The majority of surgical procedures in this group of patients were hernia repairs (71%). The total cost of the 145 investigations required by PDPOA was £9,694. By adopting SDPOA, rather than PDPOA, a potential saving of £9,694 was possible.

Investigations were required for all patients in group 3 (n=48). Fewer were requested by the surgeon than by PDPOA. The majority (58%) of the patients in this group underwent laparoscopic cholecystectomy. The cost of the tests requested by the surgeon would have been £25,393, but with the additional PDPOA costs, this rose to £34,291. The potential cost saving for this group was therefore £8,898.

The total cost for all investigations in all groups was £43,985. We identified that there were potential cost savings of £9,694 (group 2) and £8,898 (group 3). The total potential saving identified for all 3 groups was £18,595, which was 42% of the total cost of all the investigations.

There were no adverse outcomes in any of the groups and therefore no surgeries were delayed, cancelled or modified by the results of any additional investigations performed as a result of PDPOA.

Discussion

The recommendations of the AAGBI and NICE are that PDPOA should be based on ASA and SSS scores rather than blanket investigations. The POA guidelines comment that patients of any age with no major co-morbidities (ASA 1 or 2) presenting for day surgery do not need any pre-operative investigations, (7) but this interpretation and its implementation is not always made.

Traditionally, POA was carried out by the Surgical House Officer (SHO) with the input of a Consultant Anaesthetist for selected patients (5). With the NHS moving to an 18-week treatment pathway, in combination with a reduction in junior doctor hours, the SHO has been replaced by Specialist Nurses who have anaesthetic support (3, 6). Kinley et al. 2002 and Rushforth et al. 2006 failed to demonstrate a difference between nurse-led and junior doctor-led service (3, 4) and therefore from 1993, nurses started to run POA clinics (7).

With the current economic climate and growing pressures on the NHS, the ability to identify and respond to savings is a necessity. The need to save money, however, should not be detrimental to patient care. This study has shown that there is no difference between SDPOA versus PDPOA with regard to clinical outcomes, but that SDPOA could result in significant potential financial savings.

References


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