Preliminary Findings: Targeting CABG patients at high risk of surgical site infection

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Background
The impact of surgical site infections (SSI), which constitutes 15.7% of HCAI, is well established. Patients with SSI have double the mortality risk and are five times more likely to be readmitted to hospital. The Royal Brompton & Harefield NHS Foundation Trust (RBHT) readmission costs for cardiac SSI exceeded £1.6 million pounds (approximately 2.2€ million euros) over three year financial period (2010-12). Patients with SSI experience longer ITU and general hospital stays: at RBHT the length of stay (LoS) is almost three times longer for a patient with a cardiac SSI (median primary LoS 30.75 vs. 11.45 days) which impacts resources to other patients as well as intangible and opportunity costs.

Assessment
Brompton & Harefield Infection Score (BHIS) effectively predicts the SSI risk in CABG patients (Figures 1 and 2) but no strategy existed to target the patients at greatest risk (BHIS ≥4, approximately 8% of the CABG patients).

<table>
<thead>
<tr>
<th>Brompton &amp; Harefield Infection Score (BHIS)</th>
<th>BHIS Predicative Model</th>
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<tbody>
<tr>
<td>SSI predicative score for CABG +/- additional procedures</td>
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<tr>
<td>Diabetic = 1 OR HbA1c &gt; 7.3% = 3</td>
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<tr>
<td>BMI &gt; 25 = 2</td>
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<td>Female = 2</td>
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<td>Emergency = 2</td>
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<td>UF ≤ 25% = 1</td>
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- Good prediction of outcome
- Area under ROC curve 0.727 (0.827 for preliminary dataset)
- Hosmer & Lemeshow test 0.149

Key Points of the BHIS-IP package:
- Extend antimicrobial decolonisation
- Agreed surgical technique
- Well-fitting support wear for females worn day and night
- Negative pressure therapy on clean, closed wounds and aseptic technique for all wound care
- Improve and increase information/resources available to patients and carers

Outcomes
October 2013 – March 2015 744 CABG RBH

- Low risk (BHIS 0-1): 492, 10 SSI 2%
- Medium risk (BHIS 2-3): 199, 7 SSI (4%)
- High risk (BHIS≥ 4): 36 patients, 4 SSI (11%) vs. With BHIS-IP (intervention), 17 patients, 0 SSI (0%)

- Although non-significant due to low numbers (p=0.3845 by Fisher's exact test), RBH data suggests implementation of a multidisciplinary approach to identification and management of those at high risk of infection is successful and warrants continuing
- Costs for High BHIS actions £225.12 (approximately 313€ euros) (female patient) vs. average of cost of readmission for surgical site infection of £25,164 (approximately 35,000€ euros) (based on 2010-12 RBHT)

Thanks and Acknowledgements: Kathryn Farrow, Philip Walters, Emma Peters, Julianne Mace, Karin McDonald and to the Royal Brompton Hospital Theatre and Surgical ward staff