Patient Blood Management: an indicator of quality in cardiac surgery

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Hospital Code Name: Royal Perth Hospital
Significant improvement in casemix adjusted LOS and other outcomes in patients admitted for CABG surgery.

Storm ranked 2nd amongst peer cardiothoracic departments across Australia and NZ, up from 5th in 2011/12.
Problem: anaemia and transfusion are independently associated with increased risk or morbidity and mortality

Aim of Innovation: improve patient care through patient blood management

What we did: Educate clinicians, address preoperative anaemia and iron deficiency, implement perioperative strategies to reduce bleeding

Outcomes:
- Reduction in transfusion
- Reduction in avg ICU hrs
- Reduction in hospital-acquired complications
KEY PROBLEM

For 93,688 multi-day, acute inpatient admissions in the 2013 calendar year, the transfusion of red blood cells was associated with increased odds of:

- Mortality: \(1.68\) fold increase
- Average length of stay: \(4.76\) days longer
- Post-procedural complication: \(2.76\) fold increase
- Hospital-acquired infection: \(2.48\) fold increase
- Respiratory complication: \(2.00\) fold increase
- Hospital cost: \(?\) fold increase
AIM OF THIS INNOVATION

- To improve patient care through the application of the three pillars of patient blood management
BASELINE DATA

- Higher transfusion rate than peer hospitals

Transfusion rate in patients undergoing elective CABG*

* excludes patients with valve repair or replacement procedures
KEY CHANGES IMPLEMENTED

- **Education**
  - **Regular presentations**

- **Pre-operative Assessment**
  - **Risk reduction** to pts by paying attention to and treating their anaemia and iron deficiency

- **Perioperative**
  - avoid conventional testing (INR/aPTT) - poor at predicting bleeding
  - stopped prophylactic treatment of bleeding - leads to over transfusion
  - test to rapidly exclude coagulopathy (TEG/ROTEM) thus indicating a surgical cause for bleeding
OUTCOMES SO FAR

Patient Blood Management: an indicator of quality in cardiac surgery

Starting October 2012 the PBM team at St. Vincent implemented strategies to reduce anaemia, bleeding and patient exposure to transfusion.

Transfusion rate in patients undergoing elective CABG*

- 49% 2010/11
- 50% 2011/12
- 52% 2012/13
- 36% 2013/14

... and average length of ICU and hospital stay

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospital length</th>
<th>ICU length</th>
<th>Total length</th>
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<tbody>
<tr>
<td>2010/11</td>
<td>9.9 days</td>
<td>9.3 days</td>
<td>19.2 days</td>
</tr>
<tr>
<td>2011/12</td>
<td>9.3 days</td>
<td>9.3 days</td>
<td>18.6 days</td>
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<tr>
<td>2012/13</td>
<td>8.9 days</td>
<td>8.9 days</td>
<td>17.8 days</td>
</tr>
</tbody>
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*excludes patients with valve repair or replacement procedures

Recent benchmark results now rank St. Vincent in 1st and in casemix adjusted LOS amongst peer cardiac surgery departments across Australia and NZ in 2012/13. Up from 5th in 2011/12.

... and hospital acquired complications

A review of the literature by the National Blood Authority concluded RBC transfusion was a significant predictor in dose-dependent fashion, of cardiac, renal, respiratory and neurologic morbidities in cardiac surgery.

Using the Classification of Hospital Acquired Diagnoses (CHADs) we identified the biggest groups of complications in CABG patients.

Complications in patients undergoing elective CABG*

- Anaemia (curred) 2010/11: 31%, 2011/12: 29%, 2012/13: 19%
- Cardiac Complications 2010/11: 24%, 2011/12: 25%, 2012/13: 23%

*excludes patients with valve repair or replacement procedures

Hospitals are accredited against the National Safety and Quality Health Service Standards. These standards require that hospital transfusion practices be in line with evidence based guidelines.
OUTCOMES SO FAR

- Between 2011/12 and 2012/13 financial year
  - RBC transfusion fell from 42% to 24% (p=0.02)
  - All transfusion fell from 52% to 33% (p=0.03)

- Patient Outcomes
  - During the same period
    - Avg ICU Hours fell from 47.0 to 39.8 (p=0.24)
    - Hospital Complications
      - Coded Anaemia fell from 23% to 8% (p=0.02)
      - Post procedural complications fell from 25% to 16% (p=0.21)
LESSONS LEARNT

- Team approach
- Power of data
  - Feedback of current practice by physician is important
  - Data on patient outcomes
- Identifying & treating iron deficiency and anaemia
  - Access to IV iron facilities
- Appreciate blood loss is important
- Build confidence in interpretation of TEG results
- Clinician leadership
  - Medical Director and CNC
- Executive support
Who can provide information on this innovation from your service?

Jenny Chamberlain-
Clinical Nurse Consultant, Patient Blood Management

Dr Warren Pavey-
Staff Specialist Anaesthetist
Director, Patient Blood Management