Challenging The STS Guidelines

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- Kansas City, KS
- 700 heart procedures a year
- Ranked 23rd in U.S. News and World Reports for Heart Care
- Top 5% for TAVR Procedures
Why do we care?

- Unnecessary blood transfusion are bad
- Evidence based medicine
- Cost prohibited not to
Introduction

• First published in 2007
  – Overview
• Revised in 2011
  – New evidence
  – Altered or added to the 61 previous recommendations.
  – Involved the The International Consortium for Evidence Based Perfusion (ICEBP)
Classification of Recommendations

- **Class I**
  - Benefit >>> Risk (should be performed)

- **Class IIa**
  - Benefit >> Risk (reasonable to use)

- **Class IIb**
  - Benefit ≥ Risk (not unreasonable)

- **Class III**
  - Benefit ≥ Risk (should not be performed)
Levels of Evidence

- **Level A**
  - Sufficient evidence from multiple randomized trials or meta-analyses
- **Level B**
  - Limited evidence from single randomized trial or nonrandomized studies
- **Level C**
  - Only expert opinion, case studies, or standard-of-care
Combing the Two

- Level (1) A
- Level (IIb) B
- Level (III) A
Transfusion Triggers

Transfusion triggers

Given that the risk of transmission of known viral diseases with blood transfusion is currently rare, fears of viral disease transmission should not limit administration of INDICATED blood products. (This recommendation only applies to countries/blood banks where careful blood screening exists.) (Level of evidence C)

Transfusion is unlikely to improve oxygen transport when the hemoglobin concentration is greater than 10 g/dL and is not recommended. (Level of evidence C)

With hemoglobin levels below 6 g/dL, red blood cell transfusion is reasonable since this can be life-saving. Transfusion is reasonable in most postoperative patients whose hemoglobin is less than 7 g/dL but no high level evidence supports this recommendation. (Level of evidence C)

It is reasonable to transfuse nonred-cell hemostatic blood products based on clinical evidence of bleeding and preferably guided by point-of-care tests that assess hemostatic function in a timely and accurate manner. (Level of evidence C)

During cardiopulmonary bypass (CPB) with moderate hypothermia, transfusion of red cells for hemoglobin ≤6 g/dL is reasonable except in patients at risk for decreased cerebral oxygen delivery (ie, history of cerebrovascular attack, diabetes, cerebrovascular disease, carotid stenosis) where higher hemoglobin levels may be justified. (Level of evidence C)

In the setting of hemoglobin values exceeding 6 g/dL while on CPB, it is reasonable to transfuse red cells based on the patient’s clinical situation, and this should be considered as the most important component of the decision making process. Indications for transfusion of red blood cells in this setting are multifactorial and should be guided by patient-related factors (ie, age, severity of illness, cardiac function, or risk for critical end-organ ischemia), the clinical setting (massive or active blood loss), and laboratory or clinical parameters (eg, hematocrit, SVO2, electrocardiogram, or echocardiographic evidence of myocardial ischemia etc.). (Level of evidence C)
Perfusion Practices

- Minicircuits
  - (1) A
- Vacuum Assisted Drainage
  - (IIb) C
- modified ultrafiltration
  - (1) A
Perfusion Practice

- Acute normovolemic hemodilution (ANH)
  - (IIb) B
- Retrograde autologous priming
  - (IIb) B
Are these all valuable tools in regards to blood conservation

- What we see versus what the data says
Let’s look at RAP

The Failure of Retrograde Autologous Priming of the Cardiopulmonary Bypass Circuit to Reduce Blood Use After Cardiac Surgical Procedures

Glenn S. Murphy, MD, Joseph W. Szokol, MD, Martin Nitsun, MD, Michael J. Avram, PhD, Jeffery S. Vender, MD, Timothy V. Vota, MD, and Todd K. Rosengart, MD

From the Department of Anesthesiology, Evanston Northwestern Healthcare, Evanston, Illinois

Table 4. Transfusion Data

<table>
<thead>
<tr>
<th>Transfusion Product</th>
<th>No RAP Group (n = 288)</th>
<th>RAP Group (n = 257)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packed Red Blood Cells</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On CPB</td>
<td>38 (0-4)</td>
<td>32 (0-4)</td>
</tr>
<tr>
<td>In OR</td>
<td>88 (0-11)</td>
<td>60 (0-5)</td>
</tr>
<tr>
<td>In ICU</td>
<td>82 (0-10)</td>
<td>62 (0-13)</td>
</tr>
<tr>
<td>Hospital ward</td>
<td>29 (0-7)</td>
<td>32 (0-6)</td>
</tr>
<tr>
<td>Overall</td>
<td>148 (0-16)</td>
<td>112 (0-17)</td>
</tr>
<tr>
<td>Fresh-Frozen Plasma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On CPB</td>
<td>3 (0-2)</td>
<td>2 (0-2)</td>
</tr>
<tr>
<td>In OR</td>
<td>18 (0-9)</td>
<td>24 (0-4)</td>
</tr>
<tr>
<td>In ICU</td>
<td>20 (0-4)</td>
<td>30 (0-5)</td>
</tr>
<tr>
<td>Hospital ward</td>
<td>2 (0-2)</td>
<td>2 (0-3)</td>
</tr>
<tr>
<td>Overall</td>
<td>36 (0-9)</td>
<td>47 (0-10)</td>
</tr>
<tr>
<td>Platelets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On CPB</td>
<td>0 (0-0)</td>
<td>1 (0-8)</td>
</tr>
<tr>
<td>In OR</td>
<td>25 (0-5)</td>
<td>31 (0-2)</td>
</tr>
<tr>
<td>In ICU</td>
<td>26 (0-4)</td>
<td>35 (0-2)</td>
</tr>
<tr>
<td>Hospital ward</td>
<td>2 (0-1)</td>
<td>4 (0-2)</td>
</tr>
<tr>
<td>Overall</td>
<td>48 (0-6)</td>
<td>60 (0-5)</td>
</tr>
</tbody>
</table>

Data are number of patients receiving transfusion product (range of units in all patients). No significant differences between the groups were noted. CPB = cardiopulmonary bypass; OR = operating room; ICU = intensive care unit; RAP = retrograde autologous priming.


Why is this

• Is it a refection in process
• Or a refection of personnel
Application of theory to enhance audit and feedback interventions to increase the uptake of evidence-based transfusion practice: an intervention development protocol

Natalie J Gould¹, Fabiana Lorenzatto¹, Simon J Stanworth², Susan Michie³, Maria E Prior⁴, Liz Glidewell⁵, Jeremy M Grimshaw⁶,⁷ and Jill J Francis¹

Background: Audits of blood transfusion demonstrate around 20% transfusions are outside national recommendations and guidelines. Audit and feedback is a widely used quality improvement intervention but...
Three kinds of patients

- Unlikely to transfuse
- Borderline
- Most likely will transfuse
When Managing a patient with a borderline hematocrit

• Option 1
  – Wait and see

• Option 2
  – Transfuse
Study protocol

**Using theories of behaviour to understand transfusion prescribing in three clinical contexts in two countries: Development work for an implementation trial**

Jill J Francis*1, Alan Tinmouth2,3, Simon J Stanworth4, Jeremy M Grimshaw2, Marie Johnston5, Chris Hyde4, Charlotte Stockton6, Jamie C Brehaut7, Dean Fergusson2 and Martin P Eccles8

Table 1: Examples of likely relevant theories, the variables within the theories, and questionnaire items for the behaviour of managing patients with borderline haemoglobin by watching and waiting instead of transfusing red cells.

<table>
<thead>
<tr>
<th>Theory</th>
<th>Predictor Variables</th>
<th>Illustrative items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of Planned Behaviour [22]</td>
<td>Attitude</td>
<td>In general, the benefits of managing patients with borderline haemoglobin by watching and waiting instead of transfusing red cells outweigh the harms. (Attitude)</td>
</tr>
<tr>
<td></td>
<td>Subjective norm (perceived pressure)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived behavioural control; Intention</td>
<td></td>
</tr>
<tr>
<td>Social Cognitive Theory [23]</td>
<td>Self-efficacy</td>
<td>I am confident that I can manage a patient with borderline haemoglobin by watching and waiting instead of transfusing red cells. (Self-efficacy)</td>
</tr>
<tr>
<td></td>
<td>Goals relevant to watching and waiting</td>
<td></td>
</tr>
<tr>
<td>Implementation Intention [36]</td>
<td>Action plan</td>
<td>I have a clear plan of how I will manage patients with borderline haemoglobin by watching and waiting instead of transfusing red cells.</td>
</tr>
</tbody>
</table>
Behavior related to blood transfusions

- Attitude
- Self efficacy
- Action plan
Attitude

• Comfort
  – Experience
  – Knowledge
    • Evidence based data
      – Registries
      – Best practice
Self Efficacy

- Am I doing harm to the patient
- Am I the only one
- Does it make sense to wait and see
Action Plan

• Pre-operative
  – Blood management strategies
    • Assess risk and plan accordingly

• Perioperative
  – Patient stable ---Wait and see

• Postoperative
  – Give them a chance
Resource

- STS guidelines
- Perfusion registries
Example of Our Results when we focused on behavior to embrace the use of best practices.
Take home points

Perfusion registries may be the gold standard to shape practice and behavior with regards to blood transfusions.
The more we know the better we are at managing patients with borderline hematocrits.
Thank you