Issues in donor recruitment & retention

ASFA Annual Meeting
Denver CO
May 23, 2013

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Carver College of Medicine--UIHC
Disclaimers

• These are my opinions, not necessarily those of my current or former employers

• I have no conflicts of interest to declare…

…so make me an offer!
How much blood will aging boomers need?

• “Small” donor pool: only 38% of the U.S. population eligible to donate and <10% do

• *Ethnic shifts:* minorities now roughly 1/3 of the U.S. population, majority by mid-century

• The economy: unemployment associated with decreased blood donations in some states, and with loss of insurance associated with decline in elective surgery

• PPACA: impact of broader access on use?

• *Blood management:* 10-15% decline in RBC use, overuse of both plasma and platelets
Boomers and blood?

Age and gender distributions in US population, 2010, 2030, 2050

US Census
Population gets older, more surgery and chemo? What happens with demand for blood?

Inpatient procedures/10,000 population
US short stay hospitals, 2010

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Procedures/10,000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 15 years</td>
<td>286</td>
</tr>
<tr>
<td>15-44 years</td>
<td>1,204</td>
</tr>
<tr>
<td>45-64 years</td>
<td>1,917</td>
</tr>
<tr>
<td>&gt;64 years</td>
<td>4,741</td>
</tr>
</tbody>
</table>
The great recession: inpatient stays in US hospitals

Source: HCUP
Repeat donors in prime demographic going down over time

Increasing ethnic diversity is creating new requirements for donor base.
Percent of RISE visits with AIS (ferritin <12) and iron def. erythropoiesis (IDE): females

Age at whole blood donation: MVRBC Jul 2009-Jun 2011

150,879 Females

<20 yrs: 9.1%
<30 yrs: 21.9%
<40 yrs: 41.5%
<50 yrs: 63.5%
Neurobehavior and perinatal Fe Deficiency

• Behavioral abnormalities
  – Poorer neurodevelopment @ school age (Tamura, 2002)
  – Infants from IDA mothers have altered temperament (Wachs, 2005)
  – Preterm infants in lowest quartile of ferritin have abnormal neurologic reflexes (Armony-Sivan, 2004)

• Electrophysiologic abnormalities
  – Preterm infants with low ferritins have slower central nerve conduction speeds (Amin, 2010)
  – Term IDDM with ferritin <35 mcg/L have impaired auditory recognition memory processing (Siddappa, 2004)
Practice variation: RBC transfusion, 2008-09

Δ=40%

Variation in practice: $1^\circ$ CABG in 102,470 patients (STS): *they can’t all be right!*

**Figure 1.** Observed Variation in Hospital-Specific Transfusion Rates for Primary Isolated CABG Surgery With Cardiopulmonary Bypass During 2008 (N=798 Sites)

Transfusion in 1\textsuperscript{st} total knee arthroplasty: totals for audited quarter: MVRBC

<table>
<thead>
<tr>
<th>Hospital ID</th>
<th># TKA</th>
<th># TKA transfused</th>
<th>% transfused</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>77</td>
<td>19</td>
<td>24.7</td>
<td>15.6-35.8</td>
</tr>
<tr>
<td>2</td>
<td>124</td>
<td>31</td>
<td>25.0</td>
<td>17.7-33.6</td>
</tr>
<tr>
<td>7</td>
<td>105</td>
<td>37</td>
<td>35.2</td>
<td>26.2-45.2</td>
</tr>
<tr>
<td>8</td>
<td>55</td>
<td>25</td>
<td>45.5</td>
<td>32.0-59.5</td>
</tr>
<tr>
<td>10</td>
<td>139</td>
<td>56</td>
<td>40.3</td>
<td>32.1-48.9</td>
</tr>
</tbody>
</table>

χ²=13.2  p=0.010
TRICC: *Primum non nocere?*

<table>
<thead>
<tr>
<th></th>
<th>Restrictive (7 g.)</th>
<th>Liberal (10 g.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n=418</strong></td>
<td><strong>n=420</strong></td>
<td></td>
</tr>
<tr>
<td><strong>%</strong></td>
<td><strong>%</strong></td>
<td><strong>p</strong></td>
</tr>
<tr>
<td><strong>30 day</strong></td>
<td>78</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>18.7</td>
<td>23.3</td>
</tr>
<tr>
<td><strong>60 day</strong></td>
<td>95</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>22.7</td>
<td>26.5</td>
</tr>
<tr>
<td><strong>Hospital</strong></td>
<td>93</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>22.2</td>
<td>28.1</td>
</tr>
</tbody>
</table>

Mortality

<table>
<thead>
<tr>
<th></th>
<th>ICU</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of stay (day)</strong></td>
<td><strong>11.0±10.7</strong></td>
<td><strong>11.5±11.3</strong></td>
<td>.53</td>
</tr>
<tr>
<td><strong>Hospital</strong></td>
<td>34.8±19.5</td>
<td>35.5±19.4</td>
<td>.58</td>
</tr>
</tbody>
</table>

“A restrictive strategy of red-cell transfusion is at least as effective as and possibly superior to a liberal strategy in critically ill patients.”

# FOCUS results

<table>
<thead>
<tr>
<th></th>
<th>8 gm trigger (restrictive) (n=1009)</th>
<th>10 gm trigger (liberal) (n=1007)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units transfused</td>
<td>652 (41.5% transfused)</td>
<td>1866 (97% transfused)</td>
</tr>
<tr>
<td>Median units</td>
<td>0 (IQ 0-1)</td>
<td>2 (IQ 1-2)</td>
</tr>
<tr>
<td>1° outcome</td>
<td>34.7%</td>
<td>35.2%</td>
</tr>
<tr>
<td>60 day mortality</td>
<td>6.6%</td>
<td>7.6%</td>
</tr>
<tr>
<td>In-hosp ACS, death</td>
<td>5.2%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Readmit, fall, fatigue, function</td>
<td>No differences</td>
<td>No differences</td>
</tr>
</tbody>
</table>

Trigger hemoglobin (grams): non-bleeding recipients

All MVRBC audits 2008-2012

Hospital and audit number
• 21 audits at 15 hospitals
• 5544 transfusion episodes (>10000 units)
Operative loss
No bleeding
Discharge
After 1st Trigger
Discharge
After 1st

Serial hemoglobins during episode of care: bleeding status
5544 transfusion episodes: MVRBC
Multiple sources. Unadjusted for increased coverage under ACA
MVRBC O RBC distributions
Nov. 2011-Feb. 2013: net 8 hospitals added

RBCs distributed

8500 9000 9500 10000 10500 11000 11500 12000
Projected use through 2017

Multiple sources. Unadjusted for increased coverage under PPACA
"...dose has no significant effect on the incidence of bleeding...with hypoproliferative thrombocytopenia..."
Barriers to effective blood management—blood centers

“So Dr. Katz, let me get this straight, you want me to pay you to get our customers to use 40% less of our core product?”

David Green, CEO MVRBC

“Yes”.

Louis M. Katz MD

former Medical Director MVRBC
Challenges: need for new approaches to recruitment/retention & collections?

Current donor base:

- Donor base aging
- Number of young repeat donors decreasing
- Ethnic diversity: adapt the RBC donor base

Aging population:

- Blood management & improved therapies: continued decreased transfusion rates
- Viability of current business model?
Millennials: a formula to reach ‘em?

Enabling Discovery + Energizing Experience + Encouraging Advocacy

Make it easy!
Swami Katz sez

- Falling RBC demand, rest flat.
- “Ethnic pressures” on RBC phenotypes
- Mature “industry” with an old business model
Everything clear??

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Dr. Cats?