Increasing Disparity Between SVS AAA Guidelines And Real World Practice For AAA Repair: The Guidelines Are No Longer Relevant: What Harm Can This Cause And What Is The Solution

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Disclosures:
None

SVS Guidelines for AAA repair

- ≥ 5.5cm – Elective Repair
- 4.5 – 5.4cm – Surveillance
- Evidence:
  - Aging RCT’s (UKSAT, MASS, ADAM, PIVOTAL)

Are Guidelines consistent with Real World Practice?
Study Objectives:

- What is the Real world practice in New England?
- Has this changed over the last 12 years?
- Is this change associated with the type of repair?

Methods

- VSGNE Database
  - All patients with iAAA repair between 2003 and 2015
- Primary Endpoint:
  - % repaired open & endovascular
    - ≥ 5.5cm
    - < 5.5cm but ≥ 5.0cm
    - < 5.0cm
- Secondary Endpoint: morbidity and mortality

VSGNE (2003 – 2015)
Infrarenal AAA repairs (iAAA)

- Total study eligible iAAA repairs: 5314
  - EVAR – 3776
  - OAR* – 1538
- Not included:
  - symptomatic or ruptured
  - concomitant iliac artery aneurysms
  - lack of data on presentation and or size

*OAR = open aneurysm repair
Results
**Repair Rates by Size and type of repair**

<table>
<thead>
<tr>
<th>Total</th>
<th>≤5.5cm</th>
<th>≥5.0 to &lt;5.5cm</th>
<th>&lt;5.0 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3778</td>
<td>2195</td>
<td>1009</td>
</tr>
<tr>
<td></td>
<td>(71.7%)</td>
<td>(48.5%)</td>
<td>(31.5%)</td>
</tr>
<tr>
<td></td>
<td>391</td>
<td>197</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>(6.5%)</td>
<td>(30.7%)</td>
<td>(24.8%)</td>
</tr>
<tr>
<td></td>
<td>139</td>
<td>67</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>(27.5%)</td>
<td>(25.7%)</td>
<td>(27.5%)</td>
</tr>
</tbody>
</table>

- P < 0.05 by Chi Square for each group

**Results**
**EVAR for iAAA <5.5cm**

- \( R^2 = 0.6879 \)
- 1.1% increase per year
- \( P < 0.05 \)

**Results**
**OAR <5.5cm**

- \( R^2 = 0.1748 \)
- 0.7% increase per year
- \( P = 0.758 \)

**Results**
**Mean age at repair**

<table>
<thead>
<tr>
<th>Mean Age</th>
<th>&lt;5.5cm</th>
<th>≥5.5cm</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVAR</td>
<td>72.8</td>
<td>75.0</td>
<td>P = 0.4282</td>
</tr>
<tr>
<td>OAR</td>
<td>68.0</td>
<td>71.5</td>
<td>P = 0.3835</td>
</tr>
</tbody>
</table>

**Results**
**Gender and small AAA repair**

<table>
<thead>
<tr>
<th>EVAR and OAR</th>
<th>Repaired</th>
<th>Repaired</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;5.5cm</td>
<td>&lt;5.0cm</td>
</tr>
<tr>
<td>Male (951)</td>
<td>37.5%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Female (1096)</td>
<td>46.2%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Significance</td>
<td>P = 0.0002</td>
<td>P = 0.1645</td>
</tr>
</tbody>
</table>

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*Images of bar charts and graphs are included showing repair rates, mean age, and percentage increase per year for EVAR and OAR.*
### EVAR (all AAA sizes)

**% Female**

![Graph showing % Female EVAR over years ranging from 2000 to 2015.](image)

### EVAR (AAA<5.5cm)

**% Female**

![Graph showing % Female EVAR <5.5cm over years ranging from 2002 to 2016.](image)

### EVAR Postop complications

<table>
<thead>
<tr>
<th>Post-OP</th>
<th>&lt; 5.5cm (N=1581)</th>
<th>≥ 5.5cm (N=2195)</th>
<th>Significance (Chi Square)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI</td>
<td>14 [0.9%]</td>
<td>34 [1.5%]</td>
<td>P = 0.05</td>
</tr>
<tr>
<td>Respiratory complication</td>
<td>22 [1.4%]</td>
<td>50 [2.3%]</td>
<td>P = 0.004</td>
</tr>
<tr>
<td>Wound complication</td>
<td>8 [0.5%]</td>
<td>14 [0.6%]</td>
<td>P = 0.8641</td>
</tr>
<tr>
<td>Return to OR</td>
<td>19 [1.2%]</td>
<td>47 [2.1%]</td>
<td>P = 0.0012</td>
</tr>
<tr>
<td>Stroke</td>
<td>2 [0.1%]</td>
<td>5 [0.2%]</td>
<td>P = 0.4615</td>
</tr>
</tbody>
</table>

### OAR Postop complications

<table>
<thead>
<tr>
<th>Post-OP</th>
<th>&lt; 5.5cm (N=529)</th>
<th>≥ 5.5cm (N=1009)</th>
<th>Significance (Chi Square)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI</td>
<td>20 [3.8%]</td>
<td>59 [5.8%]</td>
<td>P = 0.0908</td>
</tr>
<tr>
<td>Respiratory complication</td>
<td>53 [10%]</td>
<td>129 [12.8%]</td>
<td>P = 0.305</td>
</tr>
<tr>
<td>Wound complication</td>
<td>20 [1.8%]</td>
<td>29 [2.9%]</td>
<td>P = 0.3456</td>
</tr>
<tr>
<td>Return to OR</td>
<td>27 [5.1%]</td>
<td>84 [8.3%]</td>
<td>P = 0.0051</td>
</tr>
<tr>
<td>Stroke</td>
<td>0 [0%]</td>
<td>6 [0.6%]</td>
<td>P = 0.0743</td>
</tr>
</tbody>
</table>

### Results: 30d Mortality Rate by AAA Size

<table>
<thead>
<tr>
<th>Size</th>
<th>Repair</th>
<th>n</th>
<th>30-day deaths</th>
<th>Percent</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥5.5cm</td>
<td>Open</td>
<td>1009</td>
<td>38</td>
<td>1.77</td>
<td>P = 0.05</td>
</tr>
<tr>
<td></td>
<td>EVAR</td>
<td>2195</td>
<td>34</td>
<td>1.55</td>
<td></td>
</tr>
<tr>
<td>≥5.0 – &lt;5.5cm</td>
<td>Open</td>
<td>390</td>
<td>7</td>
<td>1.79</td>
<td>P = 0.17</td>
</tr>
<tr>
<td></td>
<td>EVAR</td>
<td>1214</td>
<td>11</td>
<td>0.91</td>
<td></td>
</tr>
<tr>
<td>&lt;5.0</td>
<td>Open</td>
<td>139</td>
<td>4</td>
<td>2.88</td>
<td>P = 0.051</td>
</tr>
<tr>
<td></td>
<td>EVAR</td>
<td>347</td>
<td>2</td>
<td>0.54</td>
<td></td>
</tr>
</tbody>
</table>

Overall 30 day Mortality in EVAR Group: 1.11%
Overall 30 day Mortality in Open Group: 3%
Overall 30-day EVAR Mortality: ≥5.5cm - 1.55% vs <5.5cm - 0.82%; p = 0.19
P=0.05 Fisher’s test

### Mortality Rate OAR and EVAR

No significant change in mortality over time

![Graph showing mortality rate over years from 2000 to 2020 for OAR and EVAR.](image)
Conclusions

- Trend most likely **multifactorial**
  - Small AAA
    - Easier to fix, lower MBM
    - Financial incentives?
  - Perception that with improved third and fourth generation devices, patients benefit and guidelines are wrong!

Increasing Disparity Between SVS AAA Guidelines And Real World Practice

**What harm can this cause?**

- Depends on who is right!
- Increased morbidity and mortality
- Increased cost
- Loss of confidence in guidelines

**What is the solution?**

- Time for new trials?
  - RCT
    - Too much money
    - Take too long
    - Changes in technology occur faster than study
    - May be underpowered — poor enrollment
- Large, prospective, postmarket registries
  - Use propensity score models
  - Cost effective
  - Can be performed quickly

**THANK YOU**