What is Wrong with Current Carotid Guidelines?  
What Would an Evidence-True Guideline Look Like?

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Fundamental Flaws in Current Evidence-Based Guidelines Favor Harmful/Wasteful Procedures…

Abbott et al, Stroke: Nov, 2015

- 34 with procedural recommendations for ACS, SCS / both
- 2008-2015
- 20 regions/countries of origin
- 6 Languages (English, German, Chinese, Korean, Dutch, Spanish)

1. Biased Recommendations Favoring Harmful & Wasteful Procedures

Current ‘Evidence-Based’ Recommendations; ACS

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Average CEA risk 50-99%</th>
<th>High CEA risk: Anatomy/Comorbidities/Undefined</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEA- yes</td>
<td>96%</td>
<td>0</td>
</tr>
<tr>
<td>CAS- yes</td>
<td>63%</td>
<td>48%</td>
</tr>
<tr>
<td>CAS- no</td>
<td>30%</td>
<td>4%</td>
</tr>
<tr>
<td>MT alone- yes</td>
<td>4%</td>
<td>11%</td>
</tr>
</tbody>
</table>

28 guidelines with procedural recommendations for ACS; 25 on CEA & 27 on CAS

Current Evidence-True Recommendations: ACS

<table>
<thead>
<tr>
<th>Procedure</th>
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<tbody>
<tr>
<td>CEA- yes</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>CAS- yes</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>CAS- no</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>CMT alone- yes</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
Current 'Evidence-Based' Recommendations: SCS

<table>
<thead>
<tr>
<th>Average-CEA risk</th>
<th>High-CEA Risk: Anatomy/Comorbidities/Undefined</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-69%</td>
<td>70-99%</td>
</tr>
<tr>
<td>50-99% Approx.</td>
<td>0</td>
</tr>
</tbody>
</table>

CEA- yes 100% 100% 0
CAS- yes 55% 58% 82%
CAS- no 24% 27% 0
MT alone- yes 0 0 6%

33 guidelines with procedural recommendations for ACS; 31 on CEA & 33 on CAS

Current 'Evidence-True' Recommendations: SCS

<table>
<thead>
<tr>
<th>Average-CEA risk</th>
<th>High-CEA Risk: Anatomy/Medical/?</th>
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<td>50-69%</td>
<td>70-99%</td>
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<tr>
<td>50-99% Approx.</td>
<td>0</td>
</tr>
</tbody>
</table>

CEA- yes 100%* 100%** 0
CAS- yes 0% 0% 0%
CAS- no 100% 100% 0
MT alone- yes Priority testing Priority testing 100%- if medical

* Only men with 50-69% (NASCET) & CEA within 2-3 weeks of last ischemic event + 30-Day S/D <6%
** Only women with 70-99% (NASCET) stenosis & CEA within 2-3 weeks of last ischemic event or men with 70-99% stenosis (NASCET) & without near-occlusion & CEA <12 weeks /30-Day S/D
*** Evidence is 22-35 years old

2. Serious Omissions Favoring Harmful/Wasteful Procedures

Evidence-True Guideline:

- Define ACS 50-99% (NASCET) & no prior ips stroke/TIA
- Define SCS 50-99% (NASCET) & ips stroke/TIA <3-12/52
- Define Av 'CEA-risk' Those in ACAS, ACST, NASCET, ECST, VA
- Define Hi 'CEA-risk' Those excluded from ACAS, ACST, NASCET, ECST, VA
- Give the ACS 30-day stroke/death standard 3% (now outdated & irrelevant due to current evidence)
- Give the SCS 30-day stroke/death standard 6% (now outdated but no direct current evidence)
- Recommend/define MT Risk factor modification & antithrombotic Rx +/- CEA
- Accessible to public Via search engines, Google

3. Flawed Evidence Ranking: Over Confidence in Randomization Favors Harmful/Wasteful Procedures

True-To-Evidence Ranking

1. Is randomisation appropriate?
2. Is the study current?
3. Have all Rx strategies been compared?
4. Was the primary outcome appropriate?
5. Was there power for clinically significant differences?
6. Was follow-up adequate?
7. Have the results been independently verified- studies & under?
Time for a Rewrite…
Evidence-based is NOT enough!

Acknowledgements

1. Co-authors
A Systematic Review of Guidelines for the Management of Asymptomatic & Symptomatic Carotid Stenosis
Stroke. Published online Oct 8th, 2015
Anne L. Abbott (Australia), Kosmas I. Paraskevas (UK), Sostinos K. Kakkar (Greece), Jonathan Golledge (Australia), Henning Eckstein (Germany), Larry J. Diaz (US), Longxing Cao (China), Qiang Fu (China), Tissa Wijeratne (Australia), Thomas W. Leung (China), Miguel Montero-Baker (USA), Byung-Chul Lee (Korea), Sabine Pircher (Australia), Marjae Bosch (Australia), Martine Demucke (Australia) & Peter Ringleb (Germany).

2. Bupa Health Foundation of Australia

Priorities
• Better guidelines immediately- e.g. correct the procedural bias
• Define current optimal medical treatment (MT) & measure impact on preventing stroke & all other complications for ACS
• Compare this with usual medical care
• Test the cost-effectiveness of detecting ACS to improve MT
• Measure impact of current optimal MT for SCS, new trials
• Only fund procedures which help patients where & when
• Systematically measure key outcomes in routine practice*
• Accurate ways to summarise & rank scientific evidence

Summary of Recommendations

<table>
<thead>
<tr>
<th>Nature of Recommendation</th>
<th>Yes</th>
<th>No</th>
<th>May be</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of Evidence</td>
<td>Score</td>
<td>Reliable/Unreliable</td>
<td></td>
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<tr>
<td>ACS not defined</td>
<td>92% (26/28)</td>
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<tr>
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<td>88% (29/33)</td>
<td></td>
</tr>
<tr>
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<td>97% (33/34)</td>
<td></td>
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<tr>
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<td>96% (32/33)</td>
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<tr>
<td>All general MT missing</td>
<td>32% (ACS) &amp; 9% (SCS)</td>
<td></td>
</tr>
<tr>
<td>All peri-procedural MT missing</td>
<td>50% (ACS) &amp; 52% (SCS)</td>
<td></td>
</tr>
<tr>
<td>No search-engine/public access</td>
<td>44%</td>
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Serious Omissions

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All peri-procedural MT missing
50% (ACS) & 52% (SCS)

No search-engine/public access
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Overall Situation: Carotid Stenosis Management
Chaos & Loss!

"It is difficult to get a man to understand something, when his salary depends upon his not understanding it!"

Upton Sinclair, 1878-1968

Call for Outcomes rather than Activity Based Medicine