Stroke and death rates after CEA are decreasing over the last 10 years:
This is not yet so after CAS...
Will this change for CAS?

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Disclosures

• None

In symptomatic RCTs...
Long-term results of CEA and CAS similar, but procedural risks seem higher with CAS

CAS = Increased procedural risk

Long-term durability similar

Meta-analysis of the procedural risks of CEA and CAS over time

• Systematic review
• Up to May 2016
• 51 studies identified
• 223 313 CEA
• 72 961 CAS
• Stroke / Death within 30 days

Risk of stroke / death following CEA over time

Risk of stroke / death following CAS over time

<table>
<thead>
<tr>
<th></th>
<th>Symptomatic Stroke / Death</th>
<th>Asymptomatic Stroke / Death</th>
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</thead>
<tbody>
<tr>
<td>Pre-2005</td>
<td>5.1%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Post-2005</td>
<td>2.7%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Overall</td>
<td>3.4%</td>
<td>2.0%</td>
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Risk of stroke / death following CAS over time

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<tr>
<td>Pre-2005</td>
<td>5.0%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Post-2005</td>
<td>4.7%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Overall</td>
<td>4.8%</td>
<td>2.6%</td>
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</table>
Why have the reported stroke & death rates fallen over time with CEA but not with CAS?

**WARNING!**
- Do not compare CEA with CAS
  - Selection bias
  - Reporting bias (many CAS studies included neuro review)
- Comparing pre-2005 with post-2005 problematic
  - Performance bias
  - Higher-risk patients offered CAS as experience grows
- Can we believe operator-reported outcomes?
  - Publication of individual results carries problems (eg, UK)

**CEA = Established Technique**

**Improved CEA outcomes...**

- Surgical advances?
  - Increasing use of LA
  - Routine patching
  - Completion imaging (quality control)

**Improved CEA outcomes...**

- Better peri-procedural medical therapy?
  - Statins
    - Statins halved procedural stroke risk in ACST-1
  - Anti-thrombotic therapy
    - Clopidogrel / Dual anti-platelet therapy
  - BP control
    - Avoiding both hypo- and hypertension

**CAS = Evolving Technology**

**Significant recent change**

- Newer stent designs (DLS)
- Flow reversal (MOMA)
- Direct cervical access (TCAR)
- Greater experience
  - May all help reduce procedural CAS risks
Procedural risks of CEA and CAS in 2018

- Contemporary risks found in robust registries
- CEA & CAS can be performed safely (by experts)
- RCTs (like ACST-2) for long-term comparison