

Real World Results of CAS and CEA

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Conflicts

- None Relevant
- My practice provides CAS and CEA in the academic medical center and the VA affiliate

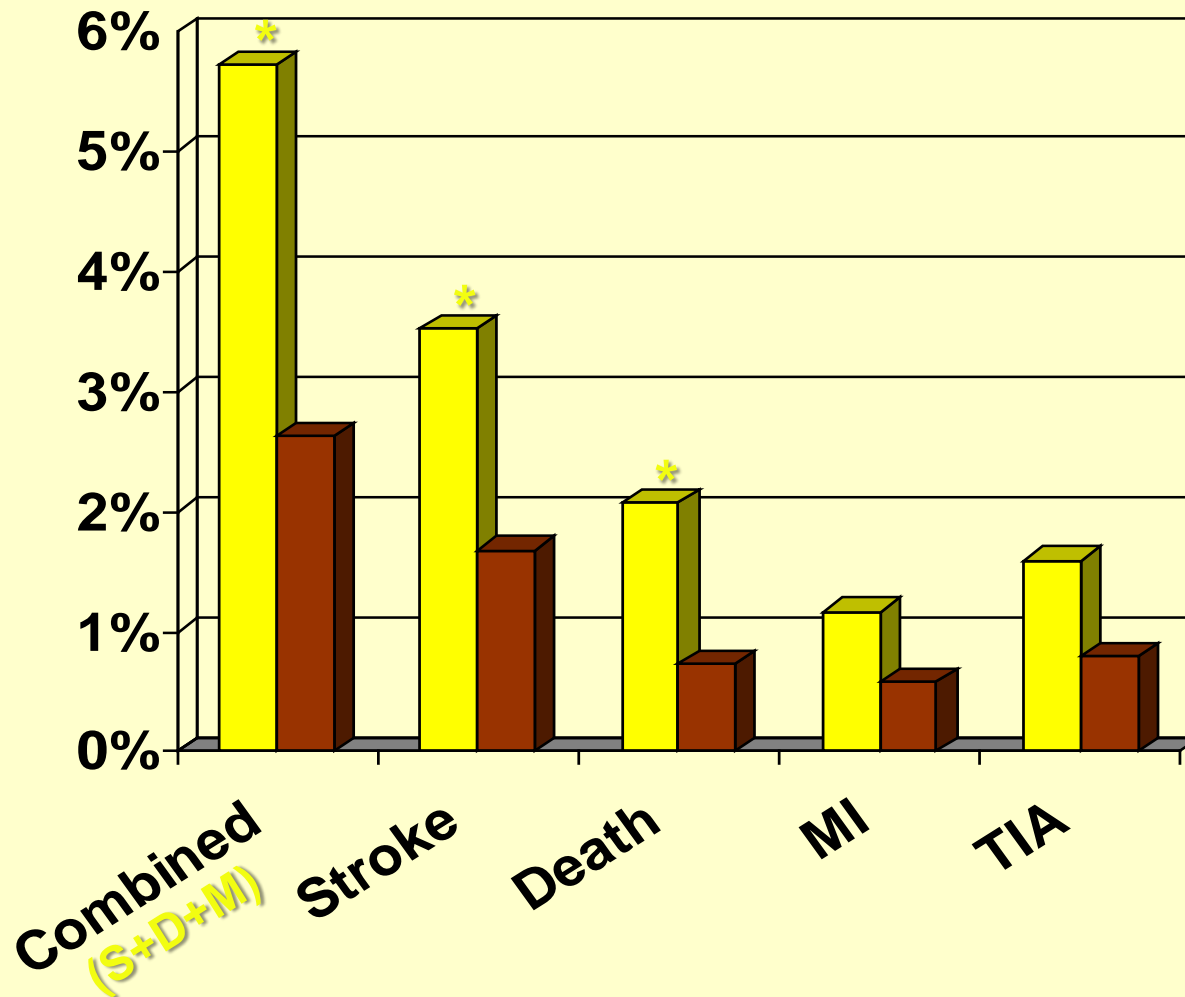
Real World Results
are not necessarily equivalent to RCTs

30-Day Stroke or Deaths after CEA & CAS in SVS Registry



Risk-adjusted 30-day outcomes of carotid stenting and endarterectomy
AN Sidawy et al J Vasc Surg 2009;49:71-9

- Analysis of prospectively entered Registry data
- 2005-2007
- 287 providers, 6 specialties, 56 centers
- 30-day outcomes
- 1450 CAS patients, 3259 CEA patients
- Not randomized

SVS Registry 30-Day Outcomes



1450 CAS
1368 CEA
Mixed
Symptomatic
& Asymptomatic

 CAS
 CEA

Stroke or Death after CEA & CAS SVS Registry

Sidawy et al JVS 2009

Stroke	CAS	CEA
All Patients	3.52%	1.68%
Asymptomatic Pts	2.11%	1.28%
Symptomatic Pts	5.27%	2.37%

Death	CAS	CEA
All Patients	2.07%	0.73%
Asymptomatic Pts	2.17%	0.79%
Symptomatic Pts	1.99%	0.70%

Outcomes after CAS & CEA in Medicare Population

Outcomes after carotid artery stenting and endarterectomy in the Medicare Population
FN Wang et al Stroke 2011;42:2019-25

- Observational study of administrative data
- Medicare 5% file 2003-2006
- Included 5 ICD-9 codes for CAS
- Not searched by cervical carotid specific CPT code
- 1323 likely CAS patients & 9635 CEA patients
- 88% of patients asymptomatic

	CAS	CEA	P-value
Stroke	1.9%	1.4%	0.20
Death	0.9%	0.6%	0.14

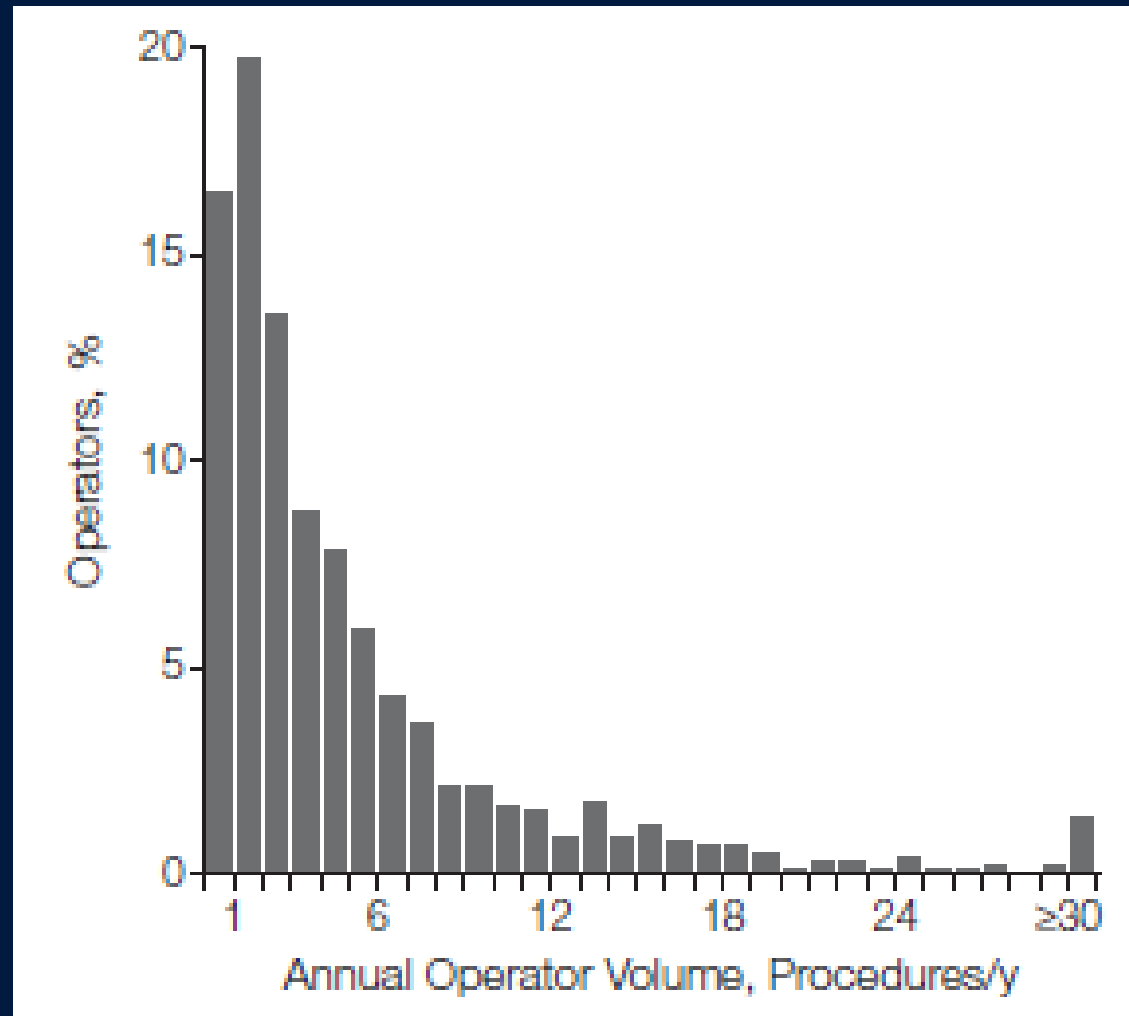
30-Day Deaths from Carotid Stenting in Medicare Beneficiaries

Operator Experience and Carotid Stenting Outcomes in Medicare Beneficiaries
B.K. Nallamothu et al JAMA 2011; 306, 1338-43 Sep 28, 2011

- Observational study of administrative data
- 2005-2007
- 30-day mortality
- Stratified by very low, low, medium, high operator volume
- 24,701 procedures by 2,339 operators
- Median annual operator volume 3.0 per year
- 11.6% of operators performed ≥ 12 CAS per year

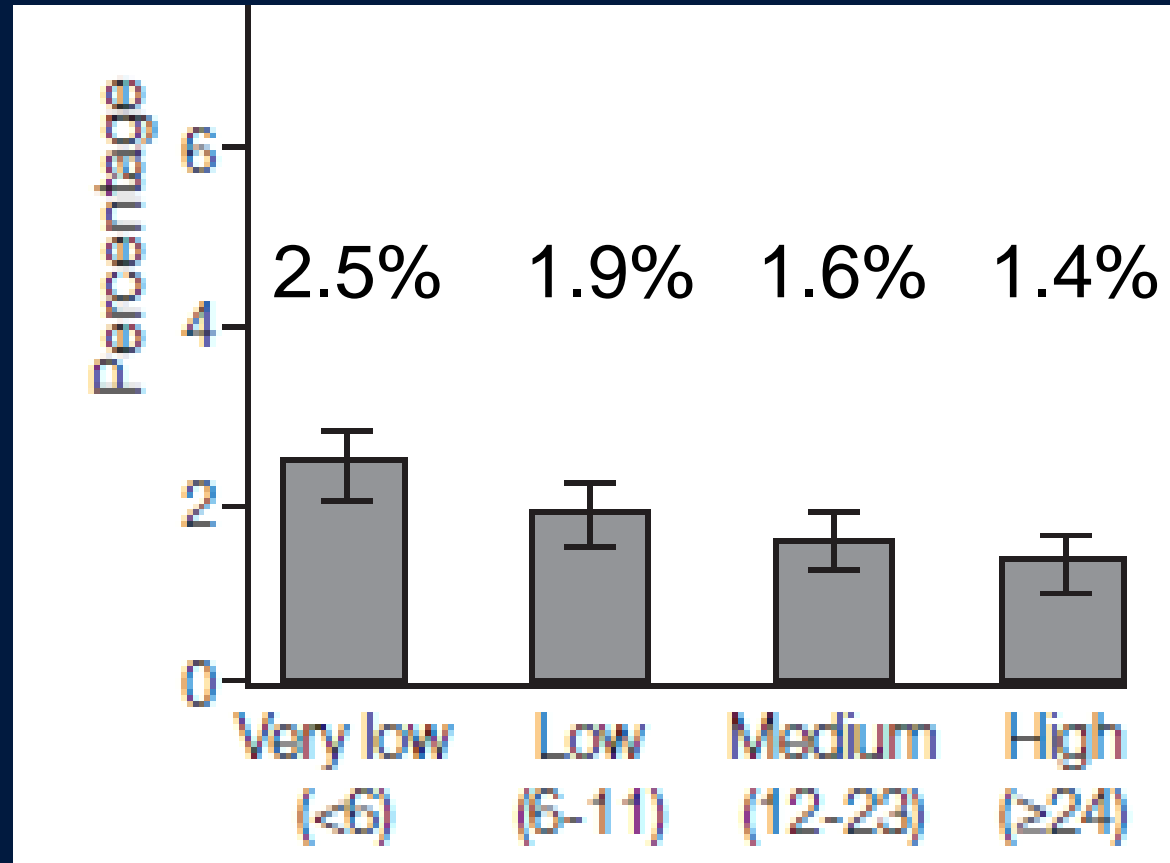
Carotid Stenting in Medicare Beneficiaries

- Median annual operator volume = 3



Deaths after Carotid Stenting in Medicare Beneficiaries

- Overall 30-day Mortality = 1.9%
- Best = 1.4% mortality in top 2% of operators
- Results substantially different from Wang et al



Deaths after Carotid Endarterectomy

Trends in the in-hospital stroke rate following carotid endarterectomy
In California and Maryland

S.L. Matsen et al J Vasc Surg 2006; 44:488-95

- Observational study of administrative data
- In-hospital stroke & mortality
- All CEA in Maryland 1994-2003, n=23,237
- All CEA in California 1999-2003, n=51,331

	MD	CA
Stroke	0.73%	0.45%
Death	0.54%	0.48%

Stroke & Deaths after CEA and CAS

Stroke and death after CEA and CAS with and without high risk criteria
K.A. Giles et al J Vasc Surg 2010; 52:1497-504

- Observational study of National Inpatient Sample 2004-07
- Primary outcome post-op death, stroke, stroke/death
- Stratified by high risk vs. non-high risk patients
- 56,564 CAS / 482,394 CEA
- ~50% patients in each group were high risk

Stroke after CEA & CAS in National Inpatient Sample 2004-7

Stroke and death after CEA & CAS Giles et al J Vasc Surg 2010; 52:1497-504

Symp + Asymp	CAS	CEA	P value
High Risk Pt	3.2%	1.8%	<.001
Non-Hi Risk Pt	3.1%	1.0%	<.001

Symptomatic	CAS	CEA	P value
High Risk Pt	14.4%	6.9%	<.001
Non-Hi Risk Pt	11.8%	4.9%	<.001

Asymptomatic	CAS	CEA	P value
High Risk Pt	1.5%	1.2%	<.05
Non-Hi Risk Pt	1.8%	0.6%	<.001

Death after CEA & CAS in NIS 2004-7

Stroke and death after CEA & CAS Giles et al J Vasc Surg 2010; 52:1497-504

Symp + Asymp	CAS	CEA	P value
High Risk Pt	1.5%	0.8%	<.001
Non-Hi Risk Pt	1.5%	0.2%	<.001

Symptomatic	CAS	CEA	P value
High Risk Pt	6.8%	2.5%	<.001
Non-Hi Risk Pt	5.3%	1.0%	<.001

Asymptomatic	CAS	CEA	P value
High Risk Pt	0.7%	0.6%	.28
Non-Hi Risk Pt	0.9%	0.1%	<.001

Real World Data Conclusions

- Even after risk-factor adjustment, stroke risk likely greater after CAS in population based studies
- Stroke & Death in high surgical risk pts ~2x after CAS vs CEA based on NIS analysis
- Stroke & Death in non-high surgical risk pts ~2x after CAS vs. CEA based on NIS analysis
- 30-day CAS mortality in Medicare may be as high as 1.9%
- 30-day CEA mortality <1.0%