


Not So! Even Young Patients with High Grade ACS Should Not Be Treated with CEA or CAS (No Exceptions)

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FACTCATS.org



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Disclosures

My academic work has been funded only by
independent grants & family subsidies





Why CEA, or Other Procedure, on ACS?

Evidence of Stroke Benefit Comes From ACAS (& ACST-1).
1 Subgroup Benefited from CEA vs Non-Invasive Care!

- Generally fit men aged <75-80 years satisfying all trial selection criteria
- 60-99% stenosis ('NASCET' criteria)
- Life expectancy $\geq 3-5$ yrs & 30-day stroke/death <1.7-3%[^]
- Only a 1%/year reduction in stroke with CEA



[^] In ACAS the 30-day stroke or death rate was 2.3% (including the angiographic risk) or 1.7% (excluding the angiographic risk). In ACST the overall 30-day stroke or death rate was 3.0% (ACAS, 1995; ACST-1 2010)



BUT- Major Improvements in Non-Invasive Arterial Care Mean:

- Average annual ipsilateral stroke rate is now very low (< about 0.8%/year)
- No current proven procedural indication for anyone
- 'High stroke risk' ACS pts who now benefit from a procedure are rare, if existent, & unidentified

Abbott et al, JVS, 2020, Abbott, Front Neurol, 2022

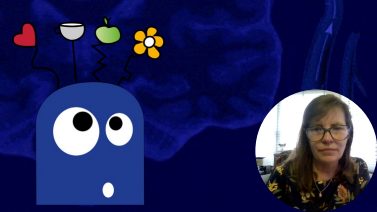



So How Can Dr Metzger Advocate to Use CAS

In anyone with asymptomatic carotid stenosis, let
alone the so called 'young'?




His Rationale is Scientifically Flawed & in Many Ways



- **Claims CAS is equivalent to CEA when it is not**
 - * Uses underpowered RTs, claims no difference & ignores trends
 - * Includes periprocedural MI to underpower stroke comparisons
 - * Omits peri-procedural stroke/death & statistics in comparisons
 - * Discounts excess CAS strokes as 'minor strokes'
- **Distracts from the main issue - procedural efficacy**
 - * Does not include any comparisons with current 'BMT'
 - * Does not describe current 'BMT' or advocate trialling it
 - * Ignores ACS pts with no procedural benefit in RTs CEA vs MT
 - * Speculation: cumulative risk with BMT, stenting technology is improving & may benefit
 - * Cites anecdotal CAS cases with good imaging outcomes
 - * Cites 'low' procedural stroke/death rates – not justification

Vithysymposium 2023; Abbott Education: <https://www.cardiovascular.abbott/us/en/hcp/education-training/endovascular-education-training/peripheral-on-demand.html>

In Contrast, CAS Is Worse than CEA

CAS Overall Causes ≈ 1.5-2 x More Peri-procedural Strokes/Deaths – Asymptomatic Carotid Stenosis

Randomized Trials With > 100 pts	'ACS'- n	Follow-up (yrs)	30-day Stroke/Death (%)		CAS Excess OR/HR, 95%CI	P
			CAS	CEA		
ACST-2, 2021	3625	5 mean	3.5	2.6	1.35 (0.9-2.0)	0.12
ACT1, 2016*	1453	0-5	2.9	1.7	1.7 (0.7-4.1)	0.33
CREST1, 2010*	1181	2.5 median	2.5	1.4	1.9 (0.8-4.4)	0.15
SPACE-2, 2019	400	1	2.5	2.5	1.0 (0.3-3.6)	0.96
SAPPHIRE, 2004*	237	1	5.4	4.6	1.2 no raw data	?
Haifa, Israel, 2016*	136	2.1 mean	?	?	?	NS

Reached significance in meta-analysis of randomised trials*: **Batchelder et al. 2019**
 Registries: 30-day or inpatient strokes/deaths: SVS, NIP, Administrative data sets.
* Calculated from raw data. Orange=underpowered study but direction of effect is against CAS
 CAS Stroke Risk not compensated by CEA MI risk
 Abbott et al JVS 2020, Batchelder et al 2019, Muller et al Cochrane System RV 2020

CAS & ACS

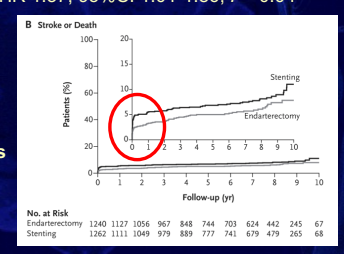
Trends: More Strokes in the Long-Term
 Include Peri-Procedural Period of Course!

Randomized Trial >400 pts, FU >12mos	'ACS' n	Follow-up (yrs)	Outcome Measure (%) CAS vs CEA		CAS Excess HR, 95%CI	P
CREST-1, 2010	1181	4 by KMA 2.5 median	PP stroke/death or later ips stroke		1.9 (1.0-3.7)	0.07
			PP death or any stroke		1.2 (1.0-1.6)	0.09
ACST-2, 2021	3625	5 mean	8.6	7.1	1.2 (1.0-1.6)	0.09
[ACT1, 2016	1453	5 by KMA (?median)	93.1	94.7	No raw data. Under-powered	0.44]

ACS=asymptomatic carotid stenosis, SCS=symptomatic patients; Orange=underpowered study

Harm of CAS is Immediate & Durable...

Peri-Procedural Stroke or Death & Later Ipsilateral Stroke in CREST-1:
 CAS vs CEA: HR 1.37; 95%CI 1.01-1.86, P=0.04



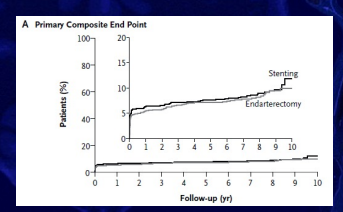
- 1607 pts with 'ACS' or SCS
- Follow-Up to 10 years (7.4 median)

No. at Risk	1240	1127	1056	967	848	744	703	624	442	245	67
Endarterectomy	1262	1111	1049	979	889	777	741	679	479	265	68
Stenting											

CREST 1 Results: Fig 1B, Brott et al. NEJM, 2016

Mr Metzger: CAS Harm Camouflaged by Including MI, Causing Underpowering & Claiming No Difference

Peri-Procedural Stroke or Death or MI & Later Ipsilateral Stroke in CREST-1: CAS vs CEA: HR 1.10; 95%CI 0.83-1.44, P=0.51



- 1607 pts with 'ACS' or SCS
- Follow-Up to 10 years (7.4 median)

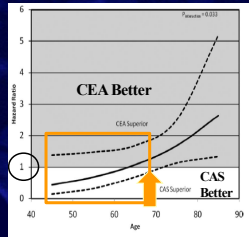
CREST 1 Results: Fig 1A, Brott et al. NEJM, 2016

CAS Not Proven Safe/Effective in 'Younger' Pts

CREST-1 Asymptomatic + Symptomatic Pts
Relative Impact CAS vs CEA

Any Peri-Procedural Stroke or Death or Ipsilateral Stroke Over 4 Years:

95% CIs of HRs overlap 1 for pts aged <70 years
Under-powering: does not mean safety, esp outside trials



Similar For Symptomatic Patients in meta-analysis of EVA3S, SPACE, & ICSS



Voeks et al on CREST-1, Stroke, 2011; Carotid Stenting Trialists' Collaboration: Lancet, 2010

Conclusion is Simple: For Anyone with Asymptomatic Carotid Stenosis, including the 'Young':

Current best non-invasive intervention alone until ≥ 1 subgroup shown to benefit from adding a carotid procedure



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