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Carotid Endarterectomy versus Carotid Stenting in the Treatment of Carotid Artery Stenosis

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Carotid Endarterectomy versus Carotid Stenting

in the treatment of Carotid Artery Stenosis

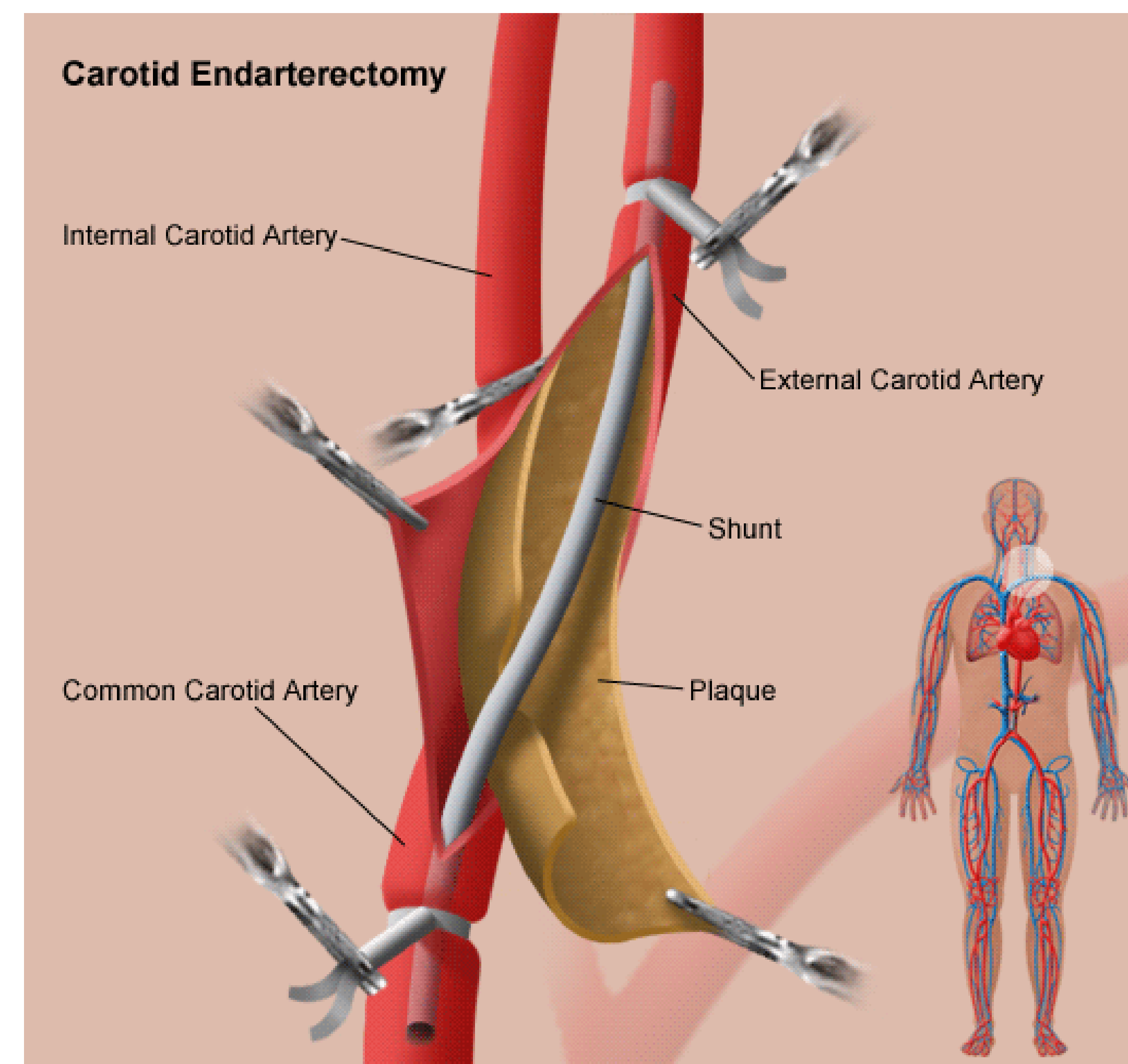
Parker B. Martin PA-S CCT-P, NR-P

Abstract

- Carotid artery stenosis secondary to atherosclerotic plaque is a leading cause of CVA in the United States
- Stenosis of the common carotid artery greater than 70% typically needs intervention
- The purpose of this study is to determine which procedure will have the best long term outcomes and prevent re-stenosis of the carotid artery.

Introduction

- Carotid artery stenosis is a disease that has gained unfortunate popularity because of the possible adverse effects and how it can affect the quality of life. The material that was selected and that has been utilized is the current and most up-to-date when it comes to evidence based medicine and best clinical applicability.
- Carotid stenosis that leads to neurological compromise has been a major medical condition that can further lead to neurological deficits including CVA, aneurysm, cerebral hypoperfusion, and mental status changes. Medication therapy alone has not been sufficient enough to treat carotid artery stenosis.



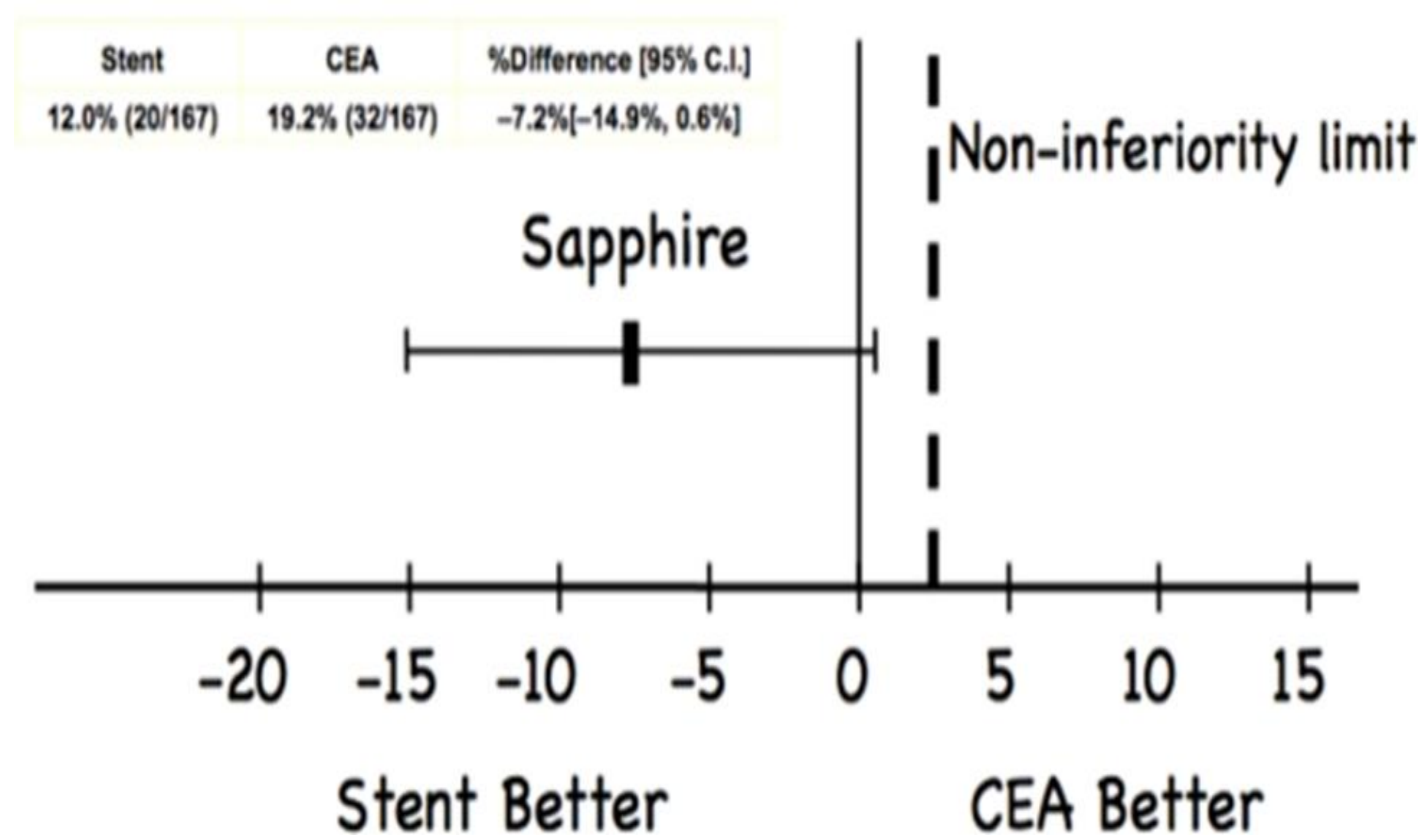
Statement of the Problem

- Which treatment modality is the most effective in treatment and prevention of symptomatic and asymptomatic carotid artery stenosis?

Research Question

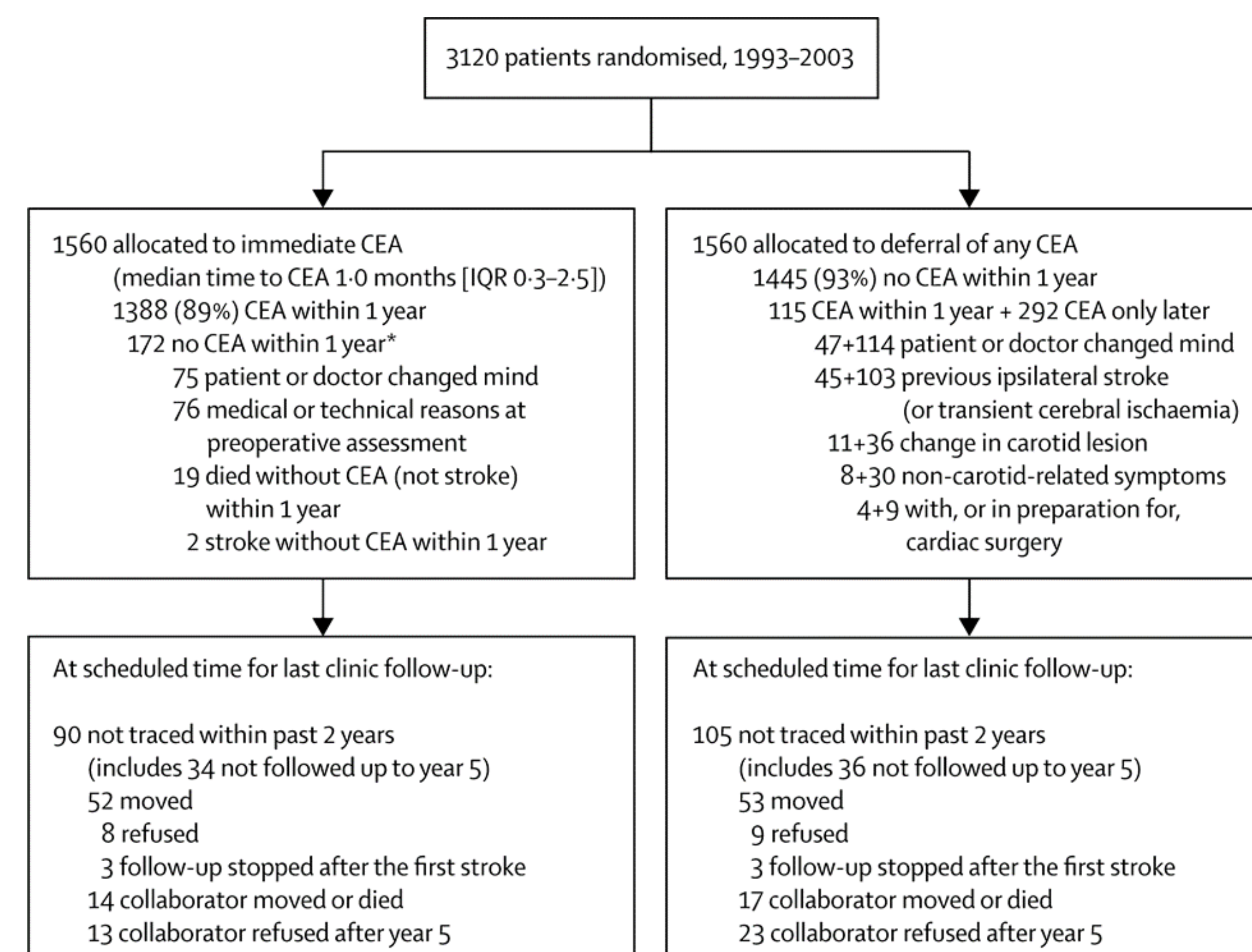
- Is carotid endarterectomy more efficient at preventing CVA versus carotid stenting?
- In patients with 70% or > stenosis, is stenting better at treating stenosis than endarterectomy?

Intention to Treat Analysis (N =334)



Literature Review

- Early identification of stenosis co-morbidities determines intervention needed.
- Surgical intervention has been found to be more beneficial to prevent and treat CVA.
- Carotid endarterectomy demonstrated successful outcomes than using stenting at treating carotid stenosis.
- Preventing neurological deficits using carotid endarterectomy was proven to be more beneficial than carotid stenting or using medication therapy alone.



Prevention versus Treatment

- Should a procedure be performed to prevent a CVA?
- Do we treat the stenosis after a CVA has occurred?

Table 2. Summary Assessment of Strength of Evidence for Comparisons Among Interventions

Outcomes, by Comparator	Strength of Evidence	Studies (Participants), n	Risk-of-Bias Rating	Consistency	Precision	Applicability	Findings
Ipsilateral stroke*							
CAS vs. CEA	Insufficient	RCT: 2 (1418) NRCS: 0	RCT: 1 low, 1 medium NRCS: NA	Inconsistent	Imprecise	Applicable†	No statistically significant difference; CAS group had greater event rate in 1 RCT and lower in another
CEA vs. medical therapy alone	Moderate	RCT: 3 (5223) NRCS: 3 (510)	RCT: 3 low NRCS: 1 medium, 2 high	Consistent	Precise	Limited applicability†	Evidence to support the use of CEA may no longer be applicable to contemporary clinical practice
CAS vs. medical therapy alone	Insufficient	RCT: 0 NRCS: 0	Not graded	Unknown	Unknown	Unknown	
Any strokes‡							
CAS vs. CEA	Insufficient	RCT: 2 (1418) NRCS: 1 (269)	RCT: 1 low, 1 medium NRCS: 1 medium	Consistent	Imprecise	Applicable†	No statistically significant difference; CAS group had greater event rate
CEA vs. medical therapy alone	Moderate	RCT: 3 (5223) NRCS: 4 (648)	RCT: 3 low NRCS: 1 medium, 3 high	Consistent	Precise	Limited applicability†	Evidence to support the use of CEA may no longer be applicable to contemporary clinical practice
CAS vs. medical therapy alone	Insufficient	RCT: 0 NRCS: 1 (946)	NRCS: 1 medium	Unknown	Precise	Limited applicability†	Insufficient evidence; only a single retrospective study was available
Death							
CAS vs. CEA	Insufficient	RCT: 1 (237) NRCS: 2 (269)	RCT: 1 medium NRCS: 1 medium	Inconsistent	Imprecise	Applicable to patients at high risk for CEA complications	No statistically significant difference between groups
CEA vs. medical therapy alone	Moderate	RCT: 3 (5223) NRCS: 2 (234)	RCT: 3 low NRCS: 2 high	Consistent	Precise	Limited applicability†	No statistically significant difference; CEA group had greater event rate
CAS vs. medical therapy alone	Insufficient	RCT: 0 NRCS: 1 (946)	RCT: NA NRCS: 1 medium	Unknown	Precise	Limited applicability†	Insufficient evidence; only a single retrospective study was available

CAS = carotid artery stenting; CEA = carotid endarterectomy; NA = not applicable; NRCS = nonrandomized, comparative study; RCT = randomized, controlled trial.
* Includes any stroke within 30 d or the composite end point of ipsilateral stroke, including any stroke or death within 30 d.
† Applicable to low to medium risk for CEA (1 RCT); high risk for CEA (1 RCT).
‡ Not applicable to contemporary clinical practice because the available studies did not use what is currently considered best medical therapy.
§ Includes any death within 30 d.

Applicability to Clinical Practice

- To set symptom based criteria for identification and procedure selection.
- Identifying co-morbid conditions that would contradict endarterectomy or stenting.
- Utilizing the best evidence based practice and continually assessing outcomes.

References

McCance, K.L., Huether, S.E., Brashers, V.L., Rote, N.S., (2010). *Pathophysiology: The Biological basis for disease in adults and children, 6th edition*. Salt Lake City, UT., Elsevier.Martini, F.H., Timmons, M.J., Tallitsch, R.B., (2010). *Human anatomy, 6th edition*. Philadelphia, PA., Pearson.

Halliday, A., Harrison, M., Hayter, Kong X., Mansfield, A., Marro, J., Pan, H., Peto, R., Potter, J., Rahimi, K., Rau, J., Robertson, S., Striefler, J., Thomas, D. (2010). 10-year stroke prevention after successful carotid endarterectomy for asymptomatic stenosis (ACST-1): A multicenter randomized trial. *The LANCET*, 376, 1074-1084
Retrieved from: [http://www.thelancet.com/journals/lancet/article/PIIS01406736\(10\)61197-X/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS01406736(10)61197-X/fulltext)

LaMuraglia, G., Brewster, D., Moncure A., Dorer, D., Stoner, M., Trehan, S., Drummond, E., Abbott, W., Cambria, R. (2004). Carotid endarterectomy at the millennium: What interventional therapy must match? *Annals of Surgery*, 240(30), 535-544.
Retrieved from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1356444/>

White, C.J. (2010). Stroke prevention: Carotid stenting versus carotid endarterectomy *F1000 Report in March, 2010*, 2-24.Retrieved from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948384/>

Hill, M., Williams, B., Ariane, M., Clark, W., Meschia, J., William, M., Mohr, J., Rhodes, J., Popma, J., Brajesh, L., Longbottom, M., Voeks, J., Howard, J., (2012). Stroke after carotid stenting and endarterectomy in revascularization endarterectomy versus stenting trial (CREST). *American Heart Association Journal of Circulation*.
Retrieved from: <http://circ.ahajournals.org/content/126/25/3054.long>

Eckstein, H., Ringleb, P., Allenberg, J., Berger, J., Fraedrich, G., Hacke, W., Henerici, M., Stingele, R., Fiehler, J., Zeumer, H., Jansen, O., (2012). Results of the stent protected angioplasty versus carotid endarterectomy study to treat asymptomatic stenosis at 2 years; A multinational, prospective randomized trial. (SPACE) *Lancet Journal of Neurology*. 7(10), 893-902.
Retrieved from: [http://www.thelancet.com/journals/laneur/article/PIIS14744422\(08\)70196-0/fulltext](http://www.thelancet.com/journals/laneur/article/PIIS14744422(08)70196-0/fulltext)

Rubin, M., Barrett, K., Brott, T., Meschia, J. (2014). Asymptomatic carotid stenosis: What we can learn from the next generation of randomized clinical trials. *The Royal Society of Journal of Medicine of Cardiovascular Disease*, 3.
Retrieved from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4157468/>

Pelz, D., Lownie, S., (2014). Primary carotid stenting. *Journal of Neurointerventional Surgery*. 17
Retrieved from: <http://jn.bmj.com/content/early/2014/10/17/neurintsurg-2014-011479.long>

Grimm, J., Arhuidese, A., Beaulieu, R., Qazi, U., Perler, B., Freishlag, J, Malas, M. (2014). Surgeon's 30-Day outcomes supporting the carotid revascularization endarterectomy versus stenting trial. *Journal of American Medical Association, Surgery*
Retrieved from: <http://archsurg.jamanetwork.com.ezproxy.undmedlibrary.org/article.aspx?articleid=1925>

Chongrusut, W., Vaniyapong, T., Rerkasem, K., (2014). Routine or selective carotid artery shunting for carotid artery endarterectomy. *Cochran Database of Peer Review*. Retrieved from: <http://onlinelibrary.wiley.com.ezproxy.undmedlibrary.org/doi/10.1002/14651858.CD000190.pub3/full>

O'Brien, M., Chandra, A., (2014). Carotid revascularization: Risks and benefits. *Vascular Health and Risk Management*. 7, 403-416. Retrieved from: <http://www.ncbi.nlm.nih.gov.ezproxy.undmedlibrary.org/pmc/articles/PMC4094625>

Marchidann, A., Marshall, R., (2011). Treatment of carotid artery disease: Endarterectomy or angioplasty? *Current Neurology and Neuroscience Reports*, 11 (1), 61-66.

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