

# Valley Vascular Surgery Associates

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In affiliation with UCSF Fresno

## Transcarotid Artery Revascularization (TCAR) Procedure

### Speakers:

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Assistant Clinical Professor, UCSF

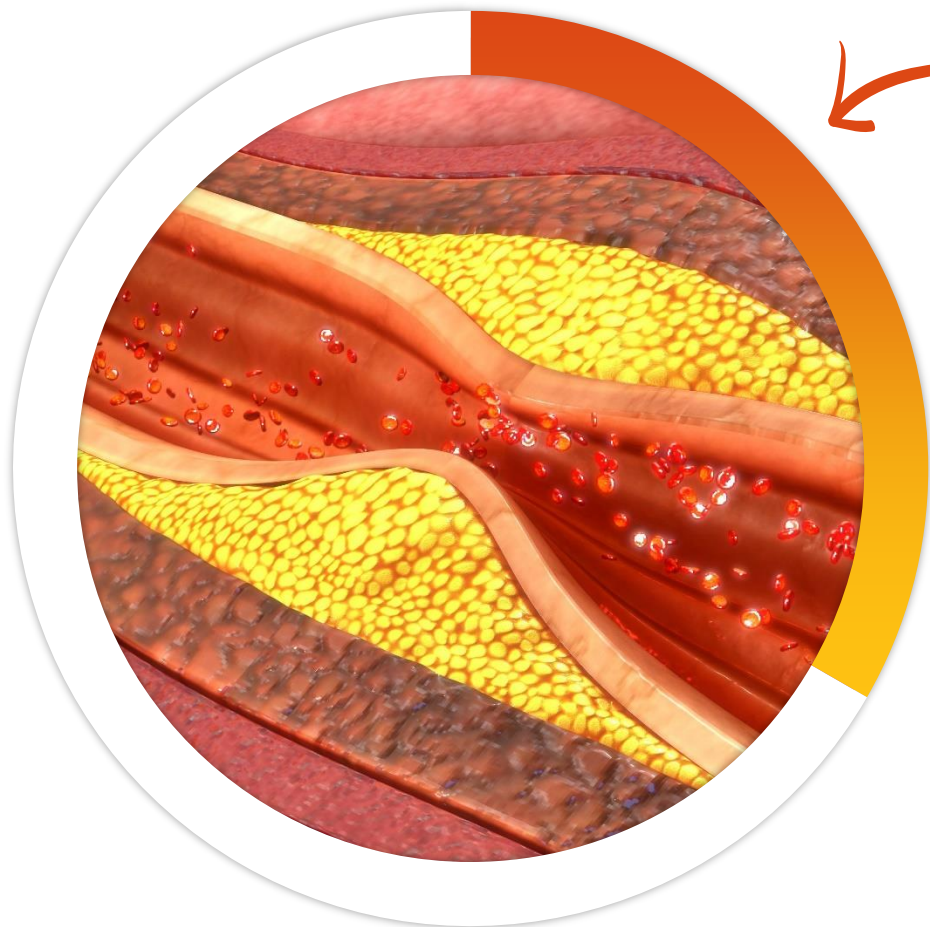


CCFMG  
Central California Faculty Medical Group

# TCAR

**Protection from stroke  
And so much more**





Up to **1/3**  
of strokes are  
from **carotid origin**<sup>1</sup>

**STROKE IS A LEADING CAUSE OF  
DEATH IN THE UNITED STATES**

Nearly **800,000** people in the United States have a stroke every year, with about three in four being first-time strokes.<sup>2</sup>

<sup>1</sup> Source: Society of Vascular Surgery's Patient-Resources, for further information and disclaimer:

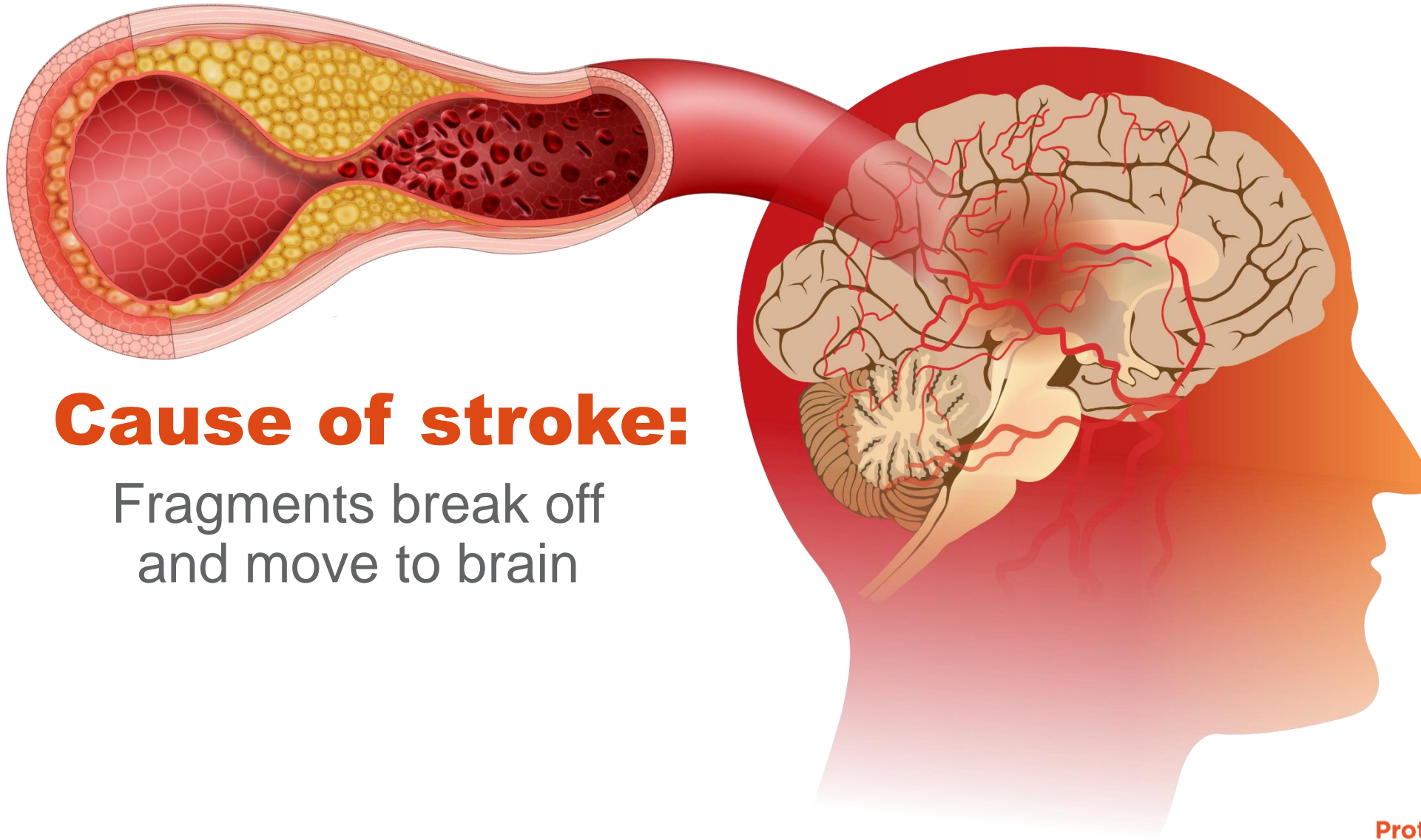
<https://vascular.org/patient-resources/vascular-conditions/carotid-artery-disease>

<sup>2</sup> Source: <https://www.ahajournals.org/doi/10.1161/STROKEAHA.114.005090>





# HOW DOES CAROTID ARTERY DISEASE CAUSE STROKE?



## Cause of stroke:

Fragments break off  
and move to brain





# Challenge of Stroke Prevention

Most carotid disease is **silent** –  
often, the first symptom a  
patient has is a stroke.







# Challenge of Stroke Prevention

It is estimated that for every **symptomatic stroke**, there are nearly **fourteen 'silent' strokes** that may result in changes to cognitive function and processes.



# ACC/AHA CAROTID SCREENING GUIDELINES

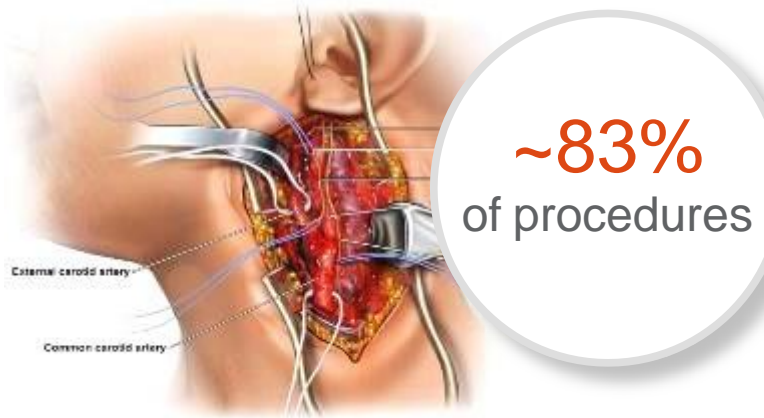


- Symptomatic (neurologic event)
- Carotid Bruit
- Evidence of Vascular Disease
  - Coronary artery disease
  - Peripheral artery disease
  - Aortic aneurysm
- >2 Atherosclerotic Risk Factors
  - Hypertension
  - Hyperlipidemia
  - Smoking history
  - Family history of stroke

**Joint Recommendations by** 2011 American College of Cardiology Foundation/American Heart Association Task Force et al. - Guidelines on the management of patients with Extracranial Carotid and Vertebral Artery Disease



## SURGICAL: Carotid Endarterectomy (CEA) 65+ years



SIGNIFICANT adverse events

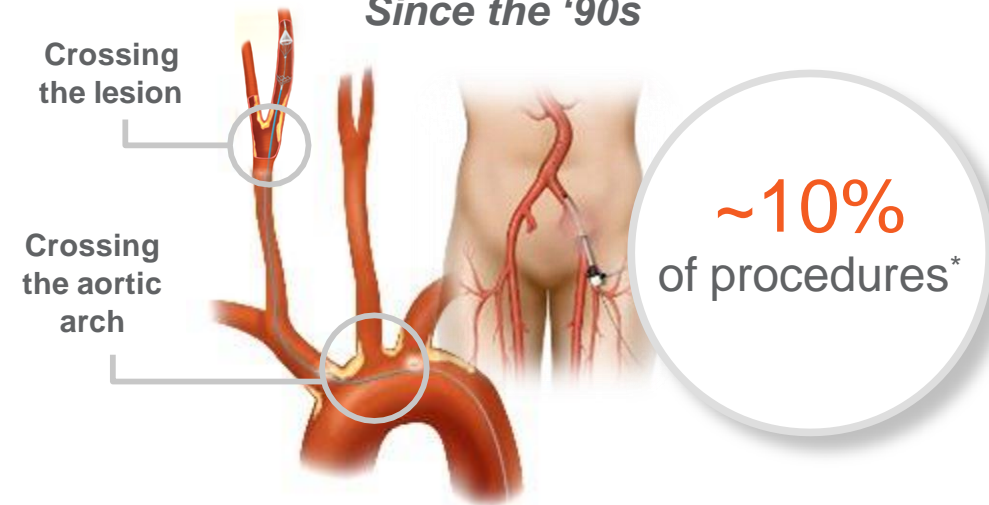


LOW 30-day stroke risk

CREST MI<sup>1</sup>: 2.3% CEA vs 1.1% TF CAS

CREST CNI<sup>2</sup>: 2.1% CNI unresolved at 6 months (80% motor)

## ENDOVASCULAR: Transfemoral Carotid Artery Stenting (CAS) *Since the '90s*



LOWER adverse events



HIGHER (~2x) 30-day stroke risk

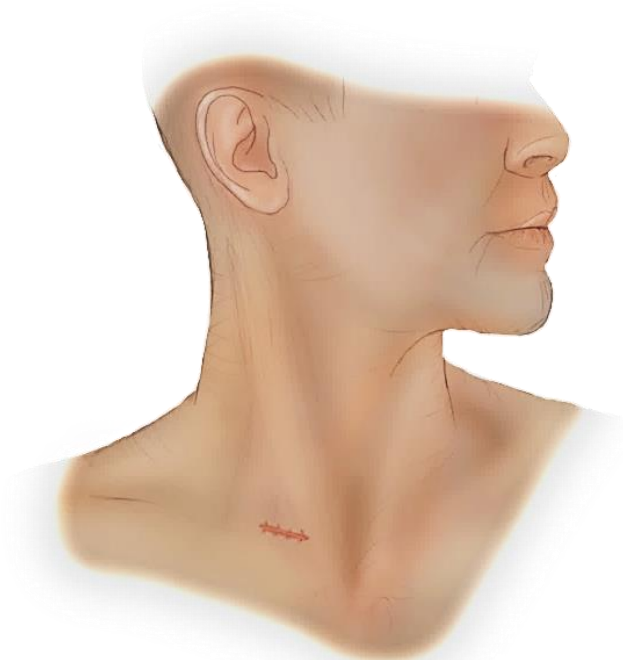
CREST 30-day All Stroke<sup>1</sup>: 2.3% CEA vs 4.1% TF CAS

Source: Modus Health Group \*Excludes TCAR procedures  
1. CREST Trial: New England Journal of Medicine 2010;363:11-23  
2. Circulation. 2012;125:2256-2264





# TCAR PARADIGM SHIFT: TRANSCAROTID



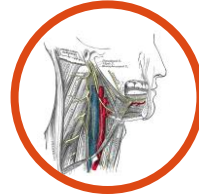
TCAR combines advantages from both worlds: **surgical principles** of neuroprotection and game-changing **endovascular technology**



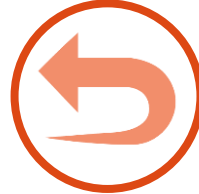
Minimally Invasive



Avoids Aortic Arch



Avoids Cranial Nerve Plexus



High-Rate Flow Reversal Neuroprotection

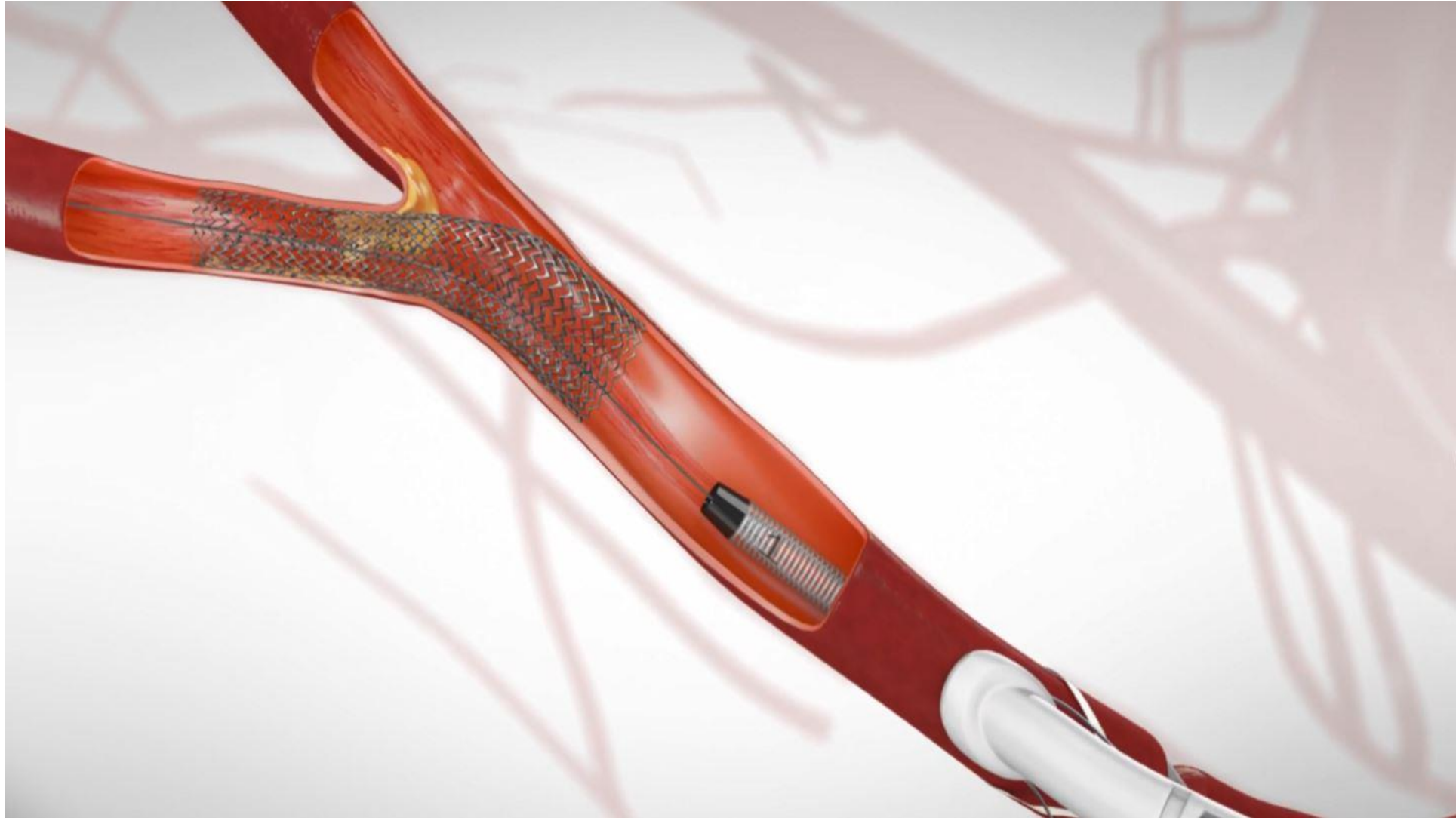


Accurate stenting

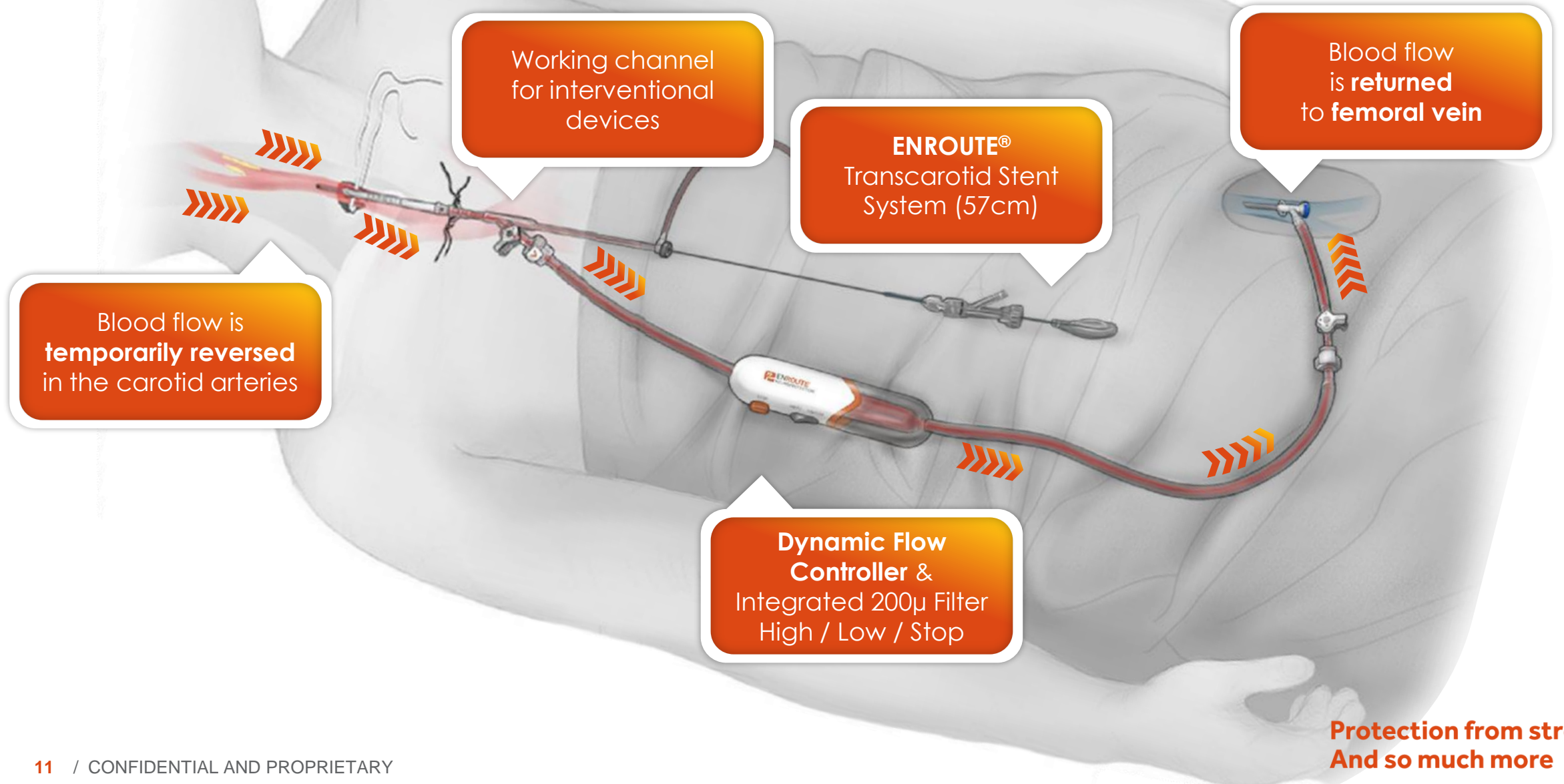
Source: Schermerhorn ML, Liang P, Eldrup-Jorgensen J, et al. Association of Transcarotid Artery Revascularization vs Transfemoral Carotid Artery Stenting With Stroke or Death Among Patients With Carotid Artery Stenosis. JAMA. 2019;322(23):2313–2322. doi:10.1001/jama.2019.18441  
Caution: Federal (USA) law restricts this device to sale by or on the order of a physician.  
Please refer to package insert for indications, contraindications, warnings, precautions, and instructions for use.



# WHAT IS TCAR?



# ENROUTE® TRANSCAROTID NEUROPROTECTION & STENT SYSTEM





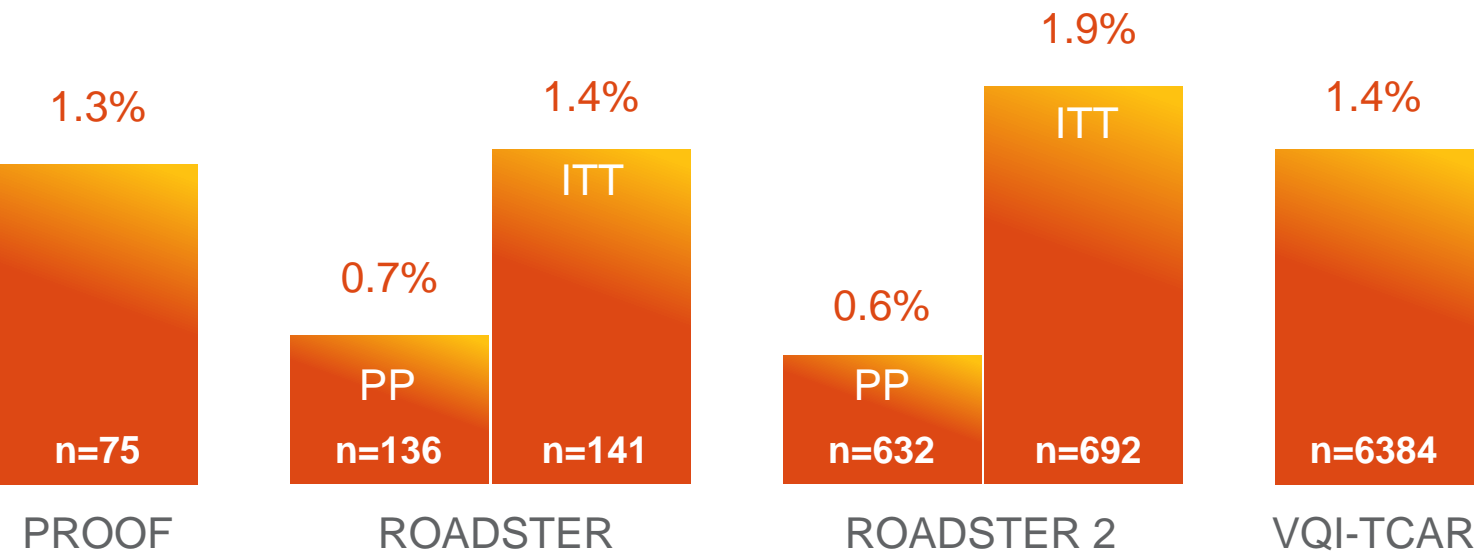
# PERIPROCEDURAL STROKE RATES

Publications of TCAR & CEA

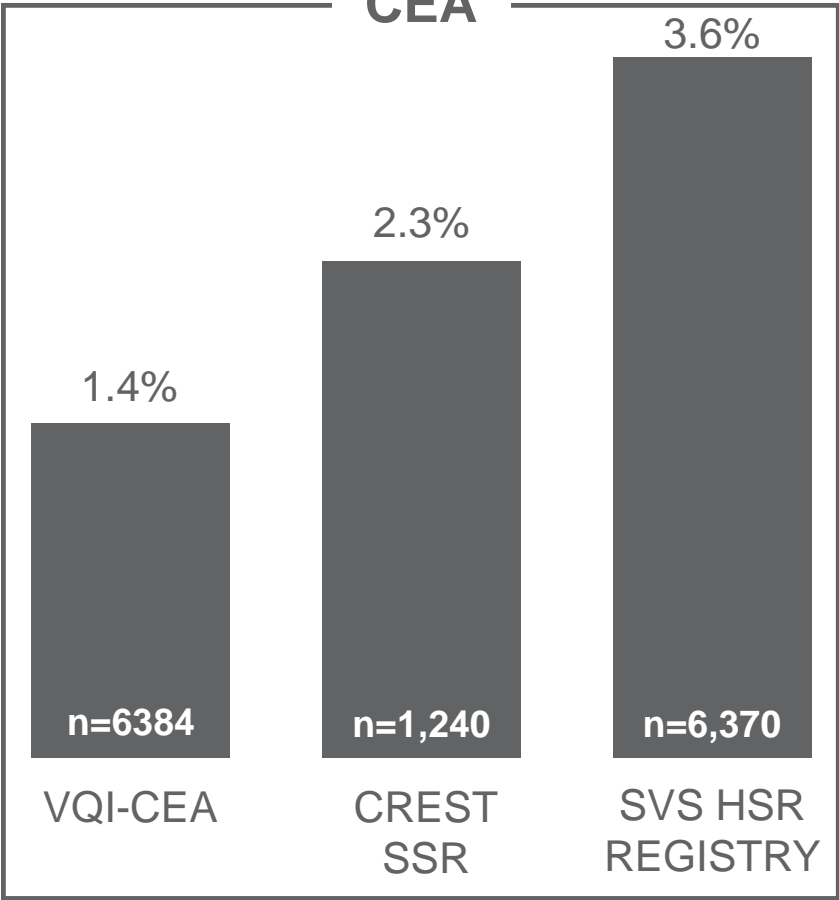
## TCAR

*“The stroke rate of **0.6%** after TCAR in the Per Protocol population may be the lowest reported rate after **any carotid intervention**.”*

–Stroke 2020; 51:2620–2629



## CEA



PROOF: J Endovasc Ther. 2017 Apr;24(2):265-270  
ROADSTER: J Vasc Surg. 2015 Nov;62(5):1227-34. The Silk Road System for Transcervical Access with Reversal of Flow to Perform TCAR: Results of the ROADSTER Trial - VEITH, 2016  
ROADSTER 2: Trial Results – Stroke. 2020;51:2620–2629; Kashyap V, Schneider P.  
Outcomes of TransCarotid Revascularization with dynamic flow reversal (TCAR) versus carotid endarterectomy (CEA) in the TCAR Surveillance Project – M. Malas, Annals of Surgery 2020  
CREST Standard Surgical Risk: N Engl J Med. 2016 Mar 17;374(11):1011-20.  
SVS Registry: J Vasc Surg. 2013 May;57(5):1318-24.

# TCAR VS TF-CAS IN THE VQI DATABASE<sup>1</sup>

The authors reviewed patient data (n = 3286 matched) collected from the VQI-TSP to compare outcomes of TCAR vs TF-CAS; published in the **Journal of the American Medical Association (JAMA)**.

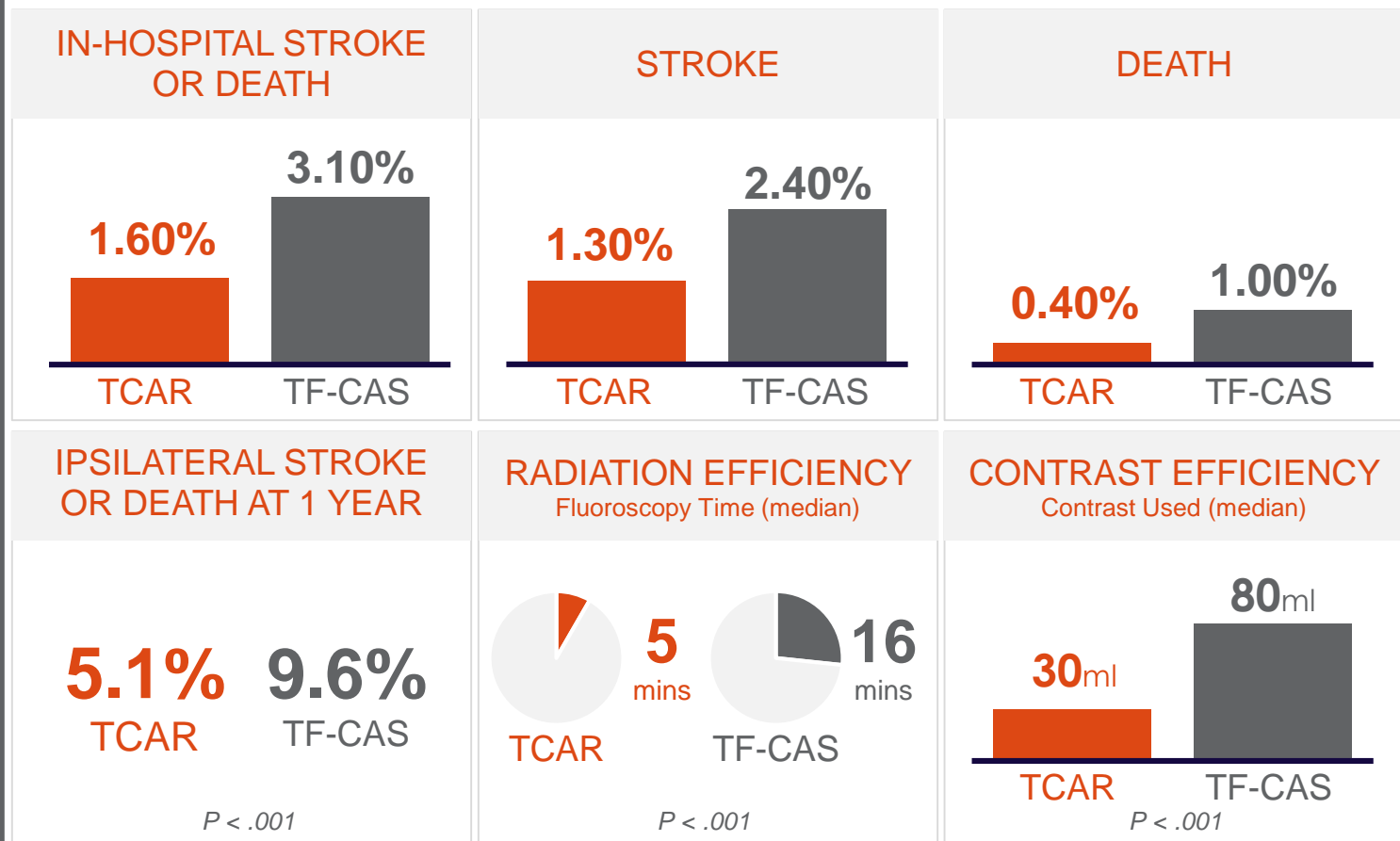
## TCAR Safety

The investigators found a significant decrease in stroke, death, and stroke/death for patients who underwent TCAR

## Durability and Efficiency

The investigators found a significant decrease in stroke or death at one year as well as procedural efficiencies with TCAR

**Conclusion:** TCAR had a *significantly lower risk of stroke or death* compared to TF-CAS with improved procedural efficiencies (radiation/contrast).



1. JAMA. 2019 Dec 17;322(23):2313-2322; Schermerhorn ML, Liang P, Eldrup-Jorgensen J, Cronenwett JL, Nolan BW, Kashyap VS, Wang GJ, Motaganahalli RL, Malas MB



# WHEN RECEIVING TCAR VS CEA, A PATIENT IS...



**86%**

Less Risk  
of CNI



**47%**

Less Risk  
of MI



**48<sub>mins</sub>**

Shorter  
OR Time



**12%**

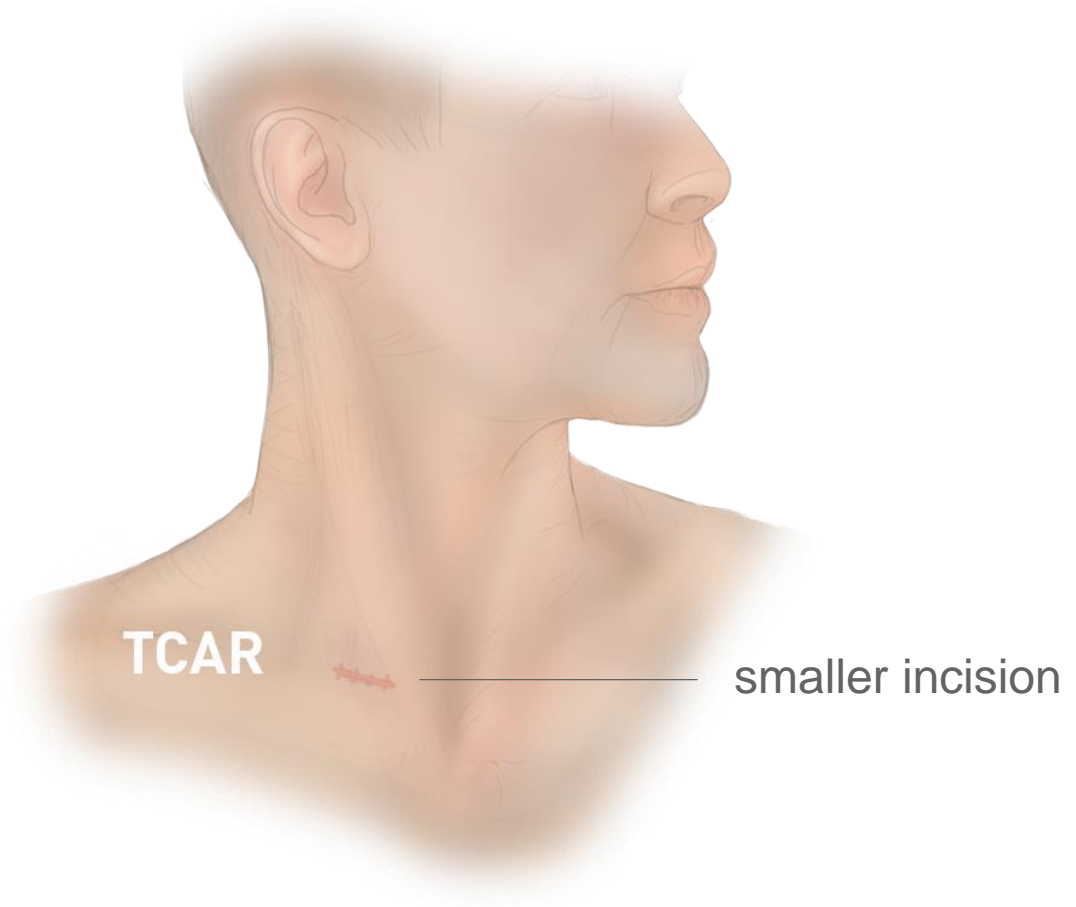
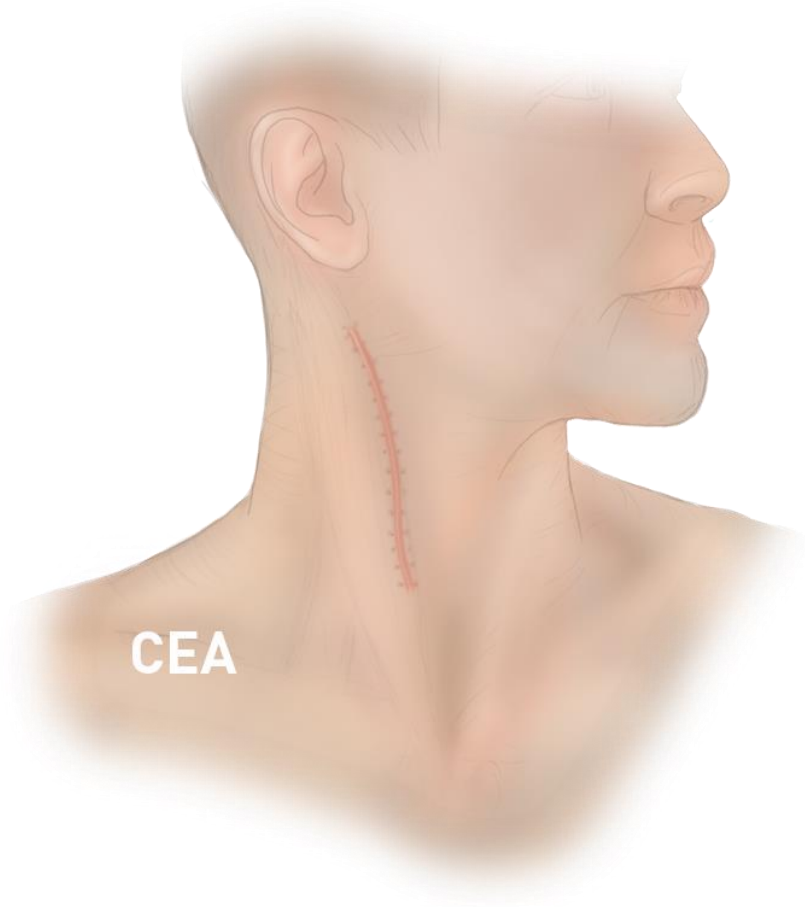
less likely to have  
an extended stay  
past one day





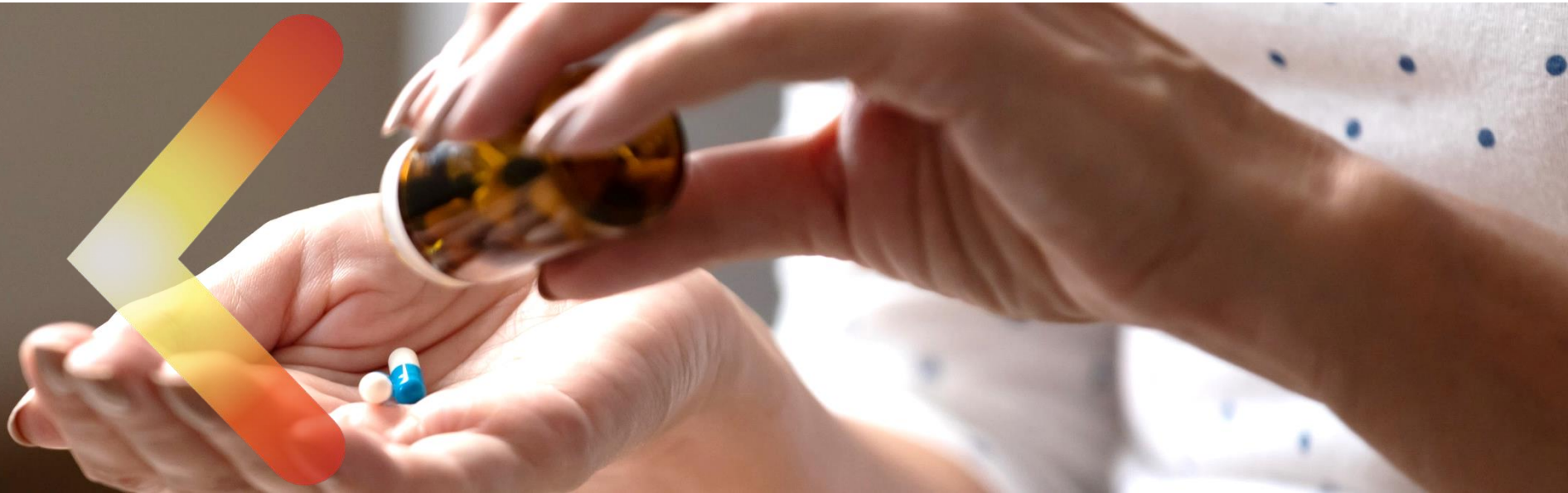
# TRANSCAROTID ARTERY REVASCULARIZATION (TCAR)

A Less Invasive Way To Prevent Stroke



# STANDARD POST-PROCEDURE MEDICATIONS

Dual antiplatelet therapy and statin\*



## Aspirin

75-325 mg/day  
continued indefinitely

## Plavix<sup>®</sup> (Clopidogrel) or equivalent

75 mg/day for at least  
4 weeks post-procedure

## Statin

Therapeutic dose for at least  
4 weeks post-procedure

**Violation of medication regimen is #1 cause of MAE in TCAR**

\*As described in the 2011 ASA/ACCF/AHA/AANN/AANS/ACR/ASNR/CNS/SAIP/SCAI/SIR/SNIS/SVM/SVS Guideline on the Management of Patients With Extracranial Carotid and Vertebral Artery Disease: Executive Summary - <https://www.ahajournals.org/doi/pdf/10.1161/CIR.0b013e31820d8d78>  
Plavix<sup>®</sup> is a registered trademark of Sanofi-Aventis.



# PATIENT TESTIMONIAL-DR. WILSON'S STORY

