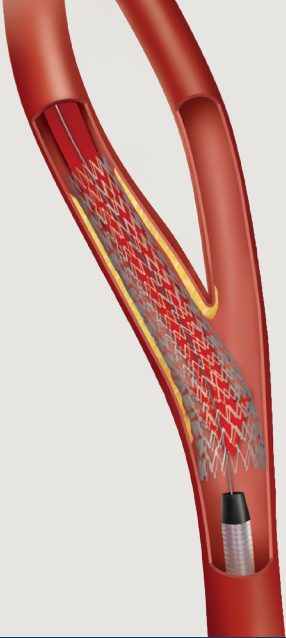




**TCAR**  
**TRANSCAROTID ARTERY**  
**REVASCULARIZATION**



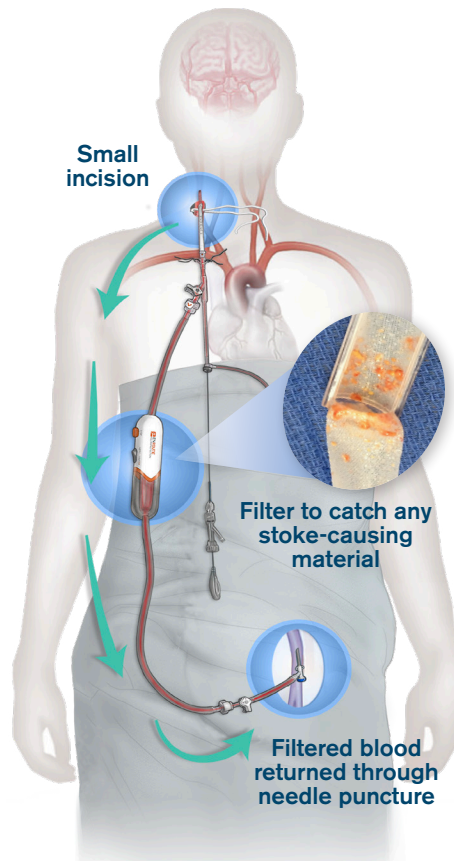


## WHAT IS TCAR?

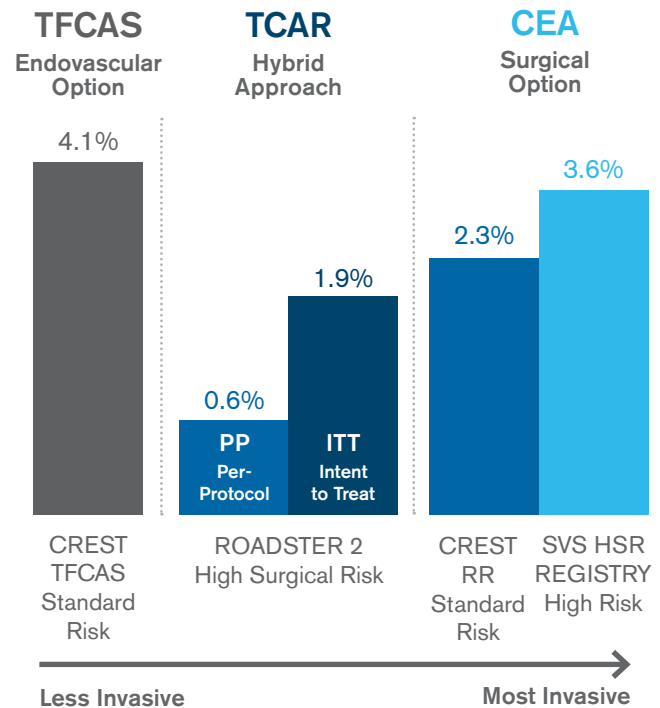
**Transcarotid Artery Revascularization (TCAR)** is a patient-friendly, minimally-invasive endovascular procedure to treat blockages in the carotid arteries. It utilizes the ENROUTE® Transcarotid Neuroprotection System to temporarily reverse blood flow away from the brain, collecting any potential debris in the device filter, before returning the blood to a vessel in the leg.

With reverse flow neuroprotection established, the ENROUTE® Transcarotid Stent is then implanted in the carotid blockage for long-term plaque stabilization and stroke prevention.

*“The stroke rate of 0.6% after TCAR in the per protocol population may be the lowest reported rate after any carotid intervention.”<sup>4</sup>*



## 30-DAY ALL STROKE<sup>1,2,3</sup>



## MEET YOUR TCAR TEAM

The vascular surgery team, under the direction of **Nicolas Mouawad, MD, MPH, MBA, FSVS, FACS, FRCS, RPVI** is proud to perform Transcarotid Artery Revascularization (TCAR) at McLaren Bay Region, which has been a TCAR Center of Excellence since 2018. Matthew Haffner, MD joined the practice in 2025.

This state-of-the-art TCAR procedure reduces the risk of stroke while offering patients a faster recovery time than traditionally prevalent methods.

To learn more about TCAR or to make a referral, contact McLaren Bay Heart & Vascular at (989) 894-3278.



**Nicolas  
Mouawad, MD**

Vascular Surgeon



**Matthew  
Haffner, MD**

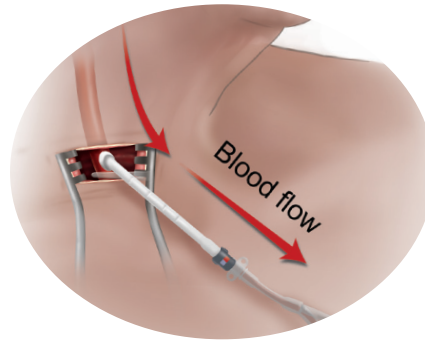
Vascular Surgeon

## BENEFITS OF A LESS INVASIVE APPROACH

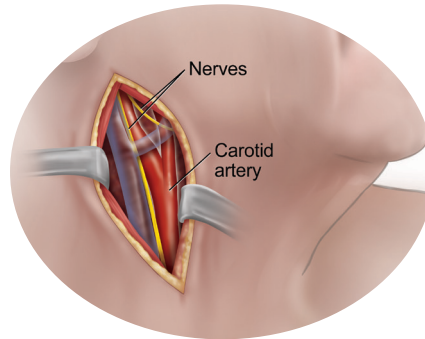
Prior to TCAR, carotid endarterectomy (CEA) was the traditional way to treat carotid artery disease surgically.

TCAR offers the following benefits:

- Less risk of myocardial infarction (heart attack)
- Less risk of cranial nerve injury (CNI)
- Less time in hospital >1 day
- Less time in operating room
- Less clamp time
- Can be done with local vs. general anesthesia



**TCAR**  
Avoids the nerve plexus



**CEA**

*Patients are 89% less likely to have CNI from a TCAR than CEA.<sup>5</sup>*

*CNI can affect smell, taste, facial expression, speech, swallowing, and muscles of the neck.*

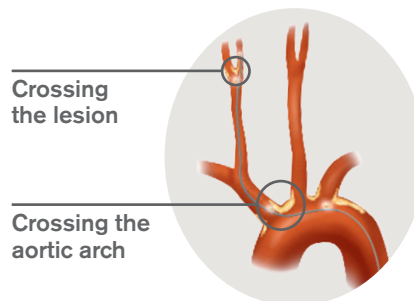
## BENEFITS OF TCAR DIRECT ACCESS

With transfemoral carotid artery stenting (TFCAS), a wire enters the body through a needle puncture in the groin.

**Compared to TFCAS, TCAR:**

- Avoids touching the disease unprotected
- Provides less risk of having a stroke

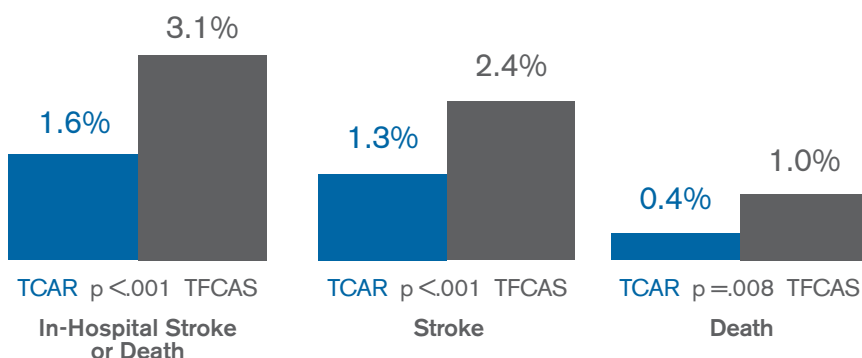
### Pitfalls of a TFCAS approach



Crossing the lesion

Crossing the aortic arch

## MICROEMBOLISM MATTERS 30-DAY OUTCOMES



1. Association of Transcarotid Artery Revascularization vs Transfemoral Carotid Artery Stenting with Stroke or Death Among Patients with Carotid Artery Stenosis. (2019, December). Schermerhorn, Marc et al. JAMA, Volume 322, Issue 23: 2313-2322.
2. Randomized Trial of Stent versus Surgery for Asymptomatic Carotid Stenosis. (2016, March). Rosenfield, Kenneth et al. New England Journal of Medicine, Volume 374, Issue 11: 1011-1020.
3. The impact of Centers for Medicare and Medicaid Services High-Risk Criteria on Outcome After Carotid Endarterectomy and Carotid Artery Stenting in the SVS Vascular Registry. (2013, May). Schermerhorn, Marc et al. Journal of Vascular Surgery, Volume 57, Issue 3, 1318-1324.
4. Early Outcomes in the ROADSTER 2 Study of Transcarotid Artery Revascularization in Patients with Significant Carotid Artery Disease. (2020, August). Kashyap, Vikram et al. Stroke, Volume 51: 2620-2629.
5. Expansion of Transcarotid Artery Revascularization to Standard Risk Patients for Treatment of Carotid Artery Stenosis. (2012, September). Liang, Patric et al. Journal of Vascular Surgery, Volume 74, Issue 3, e27-e28.

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