

# Trans Carotid Artery Revascularization (TCAR) in a Community Hospital



Sabina M Sorondo

*Medical College of Georgia / AU-UGA Medical Partnership*

Jonathan D Woody, MD

*University Vascular*

*Adjunct Clinical Associate Professor / Faculty of Medical Sciences / University of Georgia*

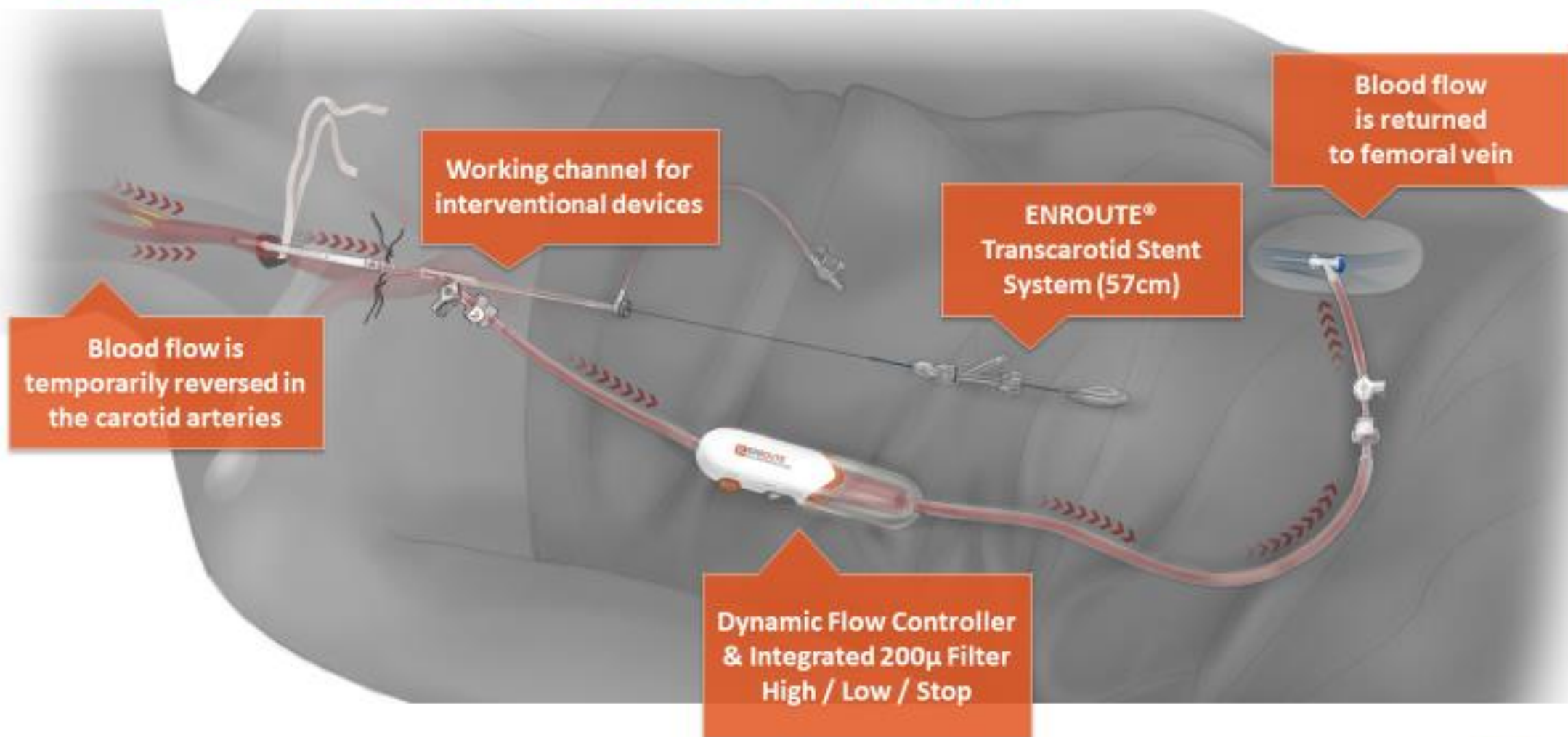
# Disclosure

*None relevant to this presentation*

# TCAR - Trans Carotid Artery Revascularization

- Novel and unique approach to treatment of carotid disease
- Combines optimal features of CEA and CAS
  - Direct / surgical carotid access
  - Neuroprotection with dynamic flow reversal vs distal embolic protection
  - Transcarotid vs transfemoral stent placement
  - Avoid aortic arch manipulation
- Initial results in high risk patients compare favorably to CEA and CAS
  - ROADSTER

# ENROUTE® TRANSCAROTID NEUROPROTECTION & STENT SYSTEM



# ENROUTE Stent

# Uber Flex Sheath



# ENROUTE Neuroprotection System



# CMS Coverage

- Symptomatic  $\geq 50\%$
- Asymptomatic  $\geq 80\%$
- Must meet at least one high risk criteria
- FDA approved carotid stent
- FDA approved neuroprotection system
- TCAR Surveillance Project (TSP)
  - FDA approved post-approval carotid stenting study
  - Obtain data about real-world outcomes of TCAR vs CEA in centers participating in the SVS Vascular Quality Initiative (VQI).

# High Risk Criteria

*must meet at least one*

## Comorbid conditions

Age  $\geq 75$   
Congestive Heart Failure  
Left Ventricular Ejection Fraction  $\leq 35\%$   
Two or more diseased coronary arteries with  $\geq 70\%$  stenosis  
Unstable angina  
Myocardial infarction within 6 weeks  
Abnormal stress test  
Need for open heart surgery  
Need for major surgery (including vascular)  
Uncontrolled diabetes  
Severe pulmonary disease  
History of liver failure with elevated prothrombin time

## Anatomic conditions

Prior head/neck surgery or irradiation  
Spinal immobility  
At risk for wound infection  
Restenosis post CEA  
Tracheostomy or tracheostoma  
Surgically inaccessible lesion  
Laryngeal palsy / Laryngectomy / Permanent contralateral cranial nerve injury  
Contralateral occlusion  
Severe tandem lesions  
Bilateral stenosis requiring treatment  
Dissection



# Methods

- Retrospective review of first 50 patients underwent TCAR
- December 2017 – March 2019
- Four vascular surgeons
  - All trained by SilkRoad / Individual case volume 8 – 17
- All patients underwent pre op CTA neck
- All cases reviewed / approved by SilkRoad Medical
- Company rep present for all cases
- Data entered in TSP (TCAR Surveillance Project) SVS / VQI
- Our case data compared with SilkRoad National TCAR Database
  - All cases done since January 2017

# Results

## ALL PATIENTS

- Typical vascular risk factors – HTN, Hyperlipidemia, DM, Smoking
- Met at least one high risk criteria
- Dual anti-platelet therapy – aspirin plus clopidogrel
- Statin therapy
- General anesthesia

# Results

## PARMC

## Natl TCAR Database

Mean Age	70 (45-89)	70
Male	62%	65%
Gen Anes	100%	79%
<b>Symptomatic</b>	<b>52%</b>	<b>37%</b>
<b>Severe Stenosis</b>	<b>96%</b>	<b>54%</b>
Engage Ext Carotid	58%	37%
Mean Proc Time	59 mins	64 mins
Mean Flow Rev Time	11 mins	11 mins
Contrast Volume	30 ml	30 ml

# Results

- Right 24 / Left 26
- Technical success 100%
- One post op hematoma requiring evacuation
- One transient recurrent laryngeal nerve palsy
- 30 day follow up all patients – NO strokes
- One year follow up 11 patients – NO strokes

# Results

- Follow up imaging available on 43 patients
  - Carotid U/S
  - One had CTA for post op headache
- 40 minimal disease
- 3 significant disease ( $> 50\%$  stenosis)
- 93% minimal disease on follow up imaging

# Results

- Persistent / Residual Stenosis
- 3 patients had  $> 50\%$  stenosis on follow up imaging
- 2 extensively calcified
  - Calcium wins
- 1 lesion just distal to stent – felt to be spasm vs residual stenosis
  - Residual stenosis – U/S lesion same exact location as intra op angio

## *Lessons learned*

- Calcium  $>$  balloon / stent
- Two view completion angio

# Random Thoughts

- Few patients with prior contralateral CEA – prefer TCAR
- Early adopters of technique – MD, OR, Admin
- More TCAR than any other hospital in GA (> 70 cases)
  - 2019 CEA 45 / TCAR 39
- PARMC is a TCAR Center of Excellence in 2018 and 2019
  - Piedmont Athens Regional, Piedmont Atlanta, Northside Forsyth





PRE



POST





# CONCLUSION

- TCAR safe and effective treatment for carotid disease
  - Compares favorably to CEA
- Achieve excellent results
  - No strokes / 93% minimal disease – *can be 100%*
- Minimal learning curve
  - Vascular surgeons already have the skill set
- TCAR program easily developed in a community hospital
  - Physician and administrative commitment