

Managing the Interventional Patient: Carotid

Dawn Vincent, RN

Oklahoma Heart Institute

Disclosures

- None

Learning Objectives

1. Understand indications for the procedure including symptoms and positive testing
2. Understand what is done pre procedure
3. Understand what is done during the procedure
4. Understand what is required for post procedural care
5. Understand what is required for discharge
6. Understand post discharge care

Stroke

- When considered separately from other cardiovascular diseases, stroke is ranked as the fourth most common cause of death in the United States.
- Stroke accounted for approximately 1 of every 19 deaths in the United States in 2011.

Heart Disease and Stroke Statistics Update
Circulation 2015; 131: e29-e322

Stroke

- Each year, approximately 795,000 Americans experience a stroke.
- Approximately 610,000 are initial attacks; and 185,000 are recurrent attacks.
- On average, every 40 seconds, someone in the United States suffers a stroke.
- Every 4 minutes, someone dies from a stroke in the United States

Heart Disease and Stroke Statistics Update *Circulation*
2015; 131: e29-e322

Stroke

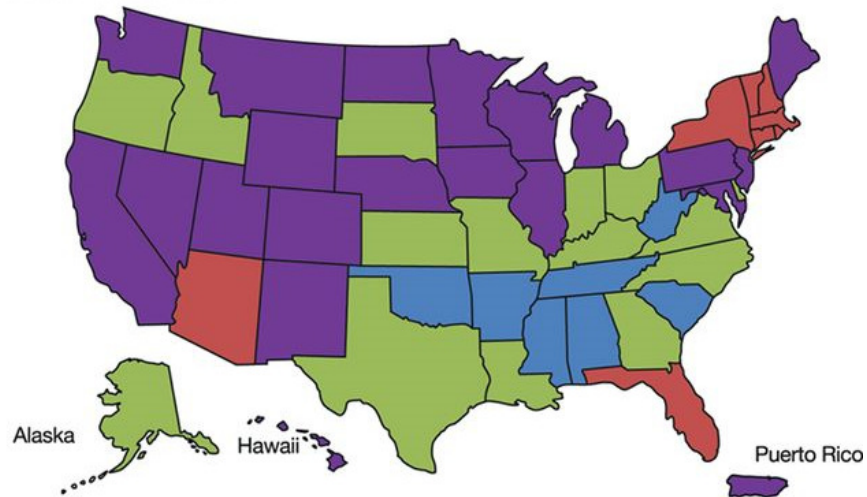
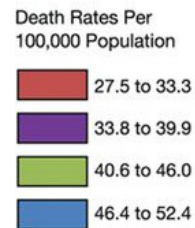
- Of all strokes:
 - 87% are ischemic in etiology
 - 13% are hemorrhagic in etiology

Heart Disease and Stroke Statistics Update. *Circulation* 2014; 124: eee-eee

Stroke

- Oklahoma's stroke death rate ranks 49th

Stroke Age-Adjusted Death Rates by State



Heart Disease and Stroke Statistics Update *Circulation* 2015; 131:
e29-e322

TIA

(transient ischemic attack)

- Estimated prevalence of TIA in the U. S. is 2.3% (*true prevalence is actually higher*).
- Many patient who experience TIA symptoms fail to report them to their physician.

Heart Disease and Stroke Statistics Update. *Circulation* 2014; 124: eee-eee

Stroke/TIA Symptom Awareness

- 51% responders were aware of the 5 stroke warning symptoms and the need to call 911.
 - 59% with bachelor's degree
 - 51% with high school diploma
 - 37% without high school diploma

Heart Disease and Stroke Statistics Update. *Circulation* 2014; 124: eee-eee.

Stroke/TIA Symptom Awareness

- 39% stroke patients did not know a single stroke/TIA symptom
 - 28% patients < 65 years
 - 47% patients $\geq$ 65 years

Heart Disease and Stroke Statistics Update. *Circulation* 2014; 124: eee-eee.

5 Symptoms of Stroke or TIA

- Weakness/numbness
- Vision problems
- Trouble speaking/understanding
- Dizziness or lightheadedness
- Severe, sudden headache

www.heartandstroke.com

SPOT A STROKE



Carotid Artery Disease

- Carotid artery disease is an important cause of stroke.
- The majority of ischemic strokes (59%) that occur in patients aged 45 to 70 years old are attributed to large artery atherosclerosis.

Stroke. 2001;32:2559-2566

Diagnosing

- Physical exam findings: listen for carotid bruit at each office visit
- Symptom identification: required for intervention
- Non invasive testing: carotid duplex, CTA, MRA. These are considered preliminary testing to determine if angiography is necessary
- Diagnostic angiogram is performed for definitive evaluation of stenosis and aortic arch type identification

Carotid Artery Revascularization Landmark Trials

- NASCET (*North American Symptomatic Carotid Endarterectomy Trial*)
- ACAS (*Asymptomatic Carotid Atherosclerosis Study*)
- ACST (*Asymptomatic Carotid Surgery Trial*)
- SAPPHERE (*Stenting and Angioplasty with Protection in Patients at High Risk for Endarterectomy trial*)
- CREST (*Carotid Revascularization Endarterectomy versus Stent Trial*)

Health-Related Quality of Life After Carotid Stenting Versus Carotid Endarterectomy

Results From CREST (Carotid Revascularization Endarterectomy Versus Stenting Trial)
J Am Coll Cardiol, 2011; 58:1557-1565.

Results: At both 2 weeks and 1 month, CAS patients had better outcomes for multiple components of the SF-36, with large differences for role physical function, pain, and the physical component summary scale (all $p < 0.01$). On the disease-specific scales, CAS patients reported less difficulty with driving, eating/swallowing, neck pain, and headaches but more difficulty with walking and leg pain (all $p < 0.05$). However, by 1 year, there were no differences in any HRQOL measure between CAS and CEA.

Summary of the Recommendations for Selection of Patients for Carotid Revascularization

- Class I
 - Recommendations should be performed
- Class IIa
 - Recommendations are reasonable to perform
- Class IIb
 - Recommendations may be reasonable to perform
- Class III
 - Recommendations are not beneficial and potentially harmful

Circulation, May 2011; doi:10.1161/CIR.0b013e31820d8c98

Summary of the Recommendations for Selection of Patients for Carotid Revascularization

- Class I
 - Symptomatic patients should undergo CEA if they are documented to have significant ipsilateral internal carotid artery stenosis (70% by doppler, 50% by angiography) and the anticipated rate of perioperative stroke or mortality is less than 6%.
 - CAS is indicated as an alternative to CEA for symptomatic patients with significant ipsilateral internal carotid artery stenosis and the anticipated rate of periprocedural stroke or mortality is less than 6%.

Circulation, May 2011; doi:10.1161/CIR.0b013e31820d8c98

Summary of the Recommendations for Selection of Patients for Carotid Revascularization

- Class IIa
 - It is reasonable to perform CEA in asymptomatic patients who have more than 70% stenosis of the internal carotid artery if the risk of perioperative stroke, MI, and death is low.
 - It is reasonable to choose CEA over CAS when revascularization is indicated in older patients, particularly when arterial pathoanatomy is unfavorable for endovascular intervention.
 - It is reasonable to choose CAS over CEA when revascularization is indicated in patients with neck anatomy unfavorable for arterial surgery.

Circulation, May 2011; doi:10.1161/CIR.0b013e31820d8c98

Summary of the Recommendations for Selection of Patients for Carotid Revascularization

- Class IIb
 - Prophylactic CAS may be considered in selected patients with significant asymptomatic carotid artery stenosis.
 - In symptomatic or asymptomatic patients at high risk of complications for carotid revascularization by either CEA or CAS because of comorbidities, the effectiveness of revascularization versus medical therapy alone is not well established.

Circulation, May 2011; doi:10.1161/CIR.0b013e31820d8c98

Summary of the Recommendations for Selection of Patients for Carotid Revascularization

- Class III (No Benefit)
 - Carotid revascularization by either CEA or CAS is not recommended when atherosclerosis narrows the lumen by less than 50%.
 - Carotid revascularization is not recommended for patients with chronic total occlusions of the targeted carotid artery.
 - Carotid revascularization is not recommended for patients with severe disability caused by cerebral infarction that precludes preservation of useful function.

Circulation, May 2011; doi:10.1161/CIR.0b013e31820d8c98

Carotid stent indicated. Now what?

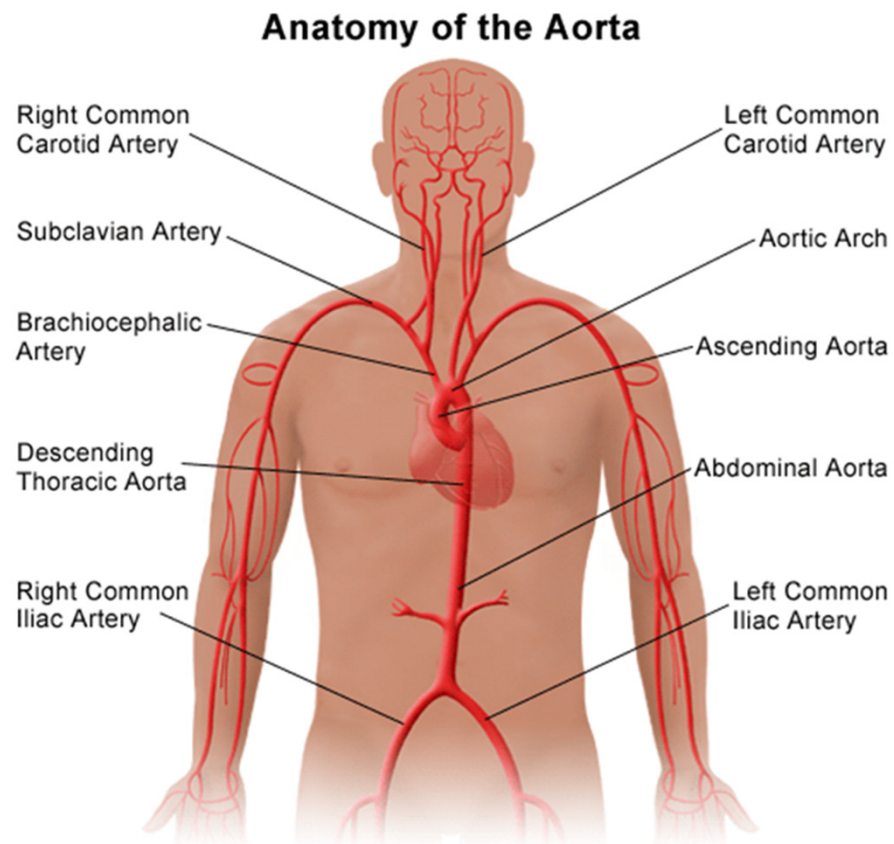


- Medicare guidelines – symptomatic, high risk
- This is an INPATIENT ONLY procedure per Medicare guidelines
- Strongly suggest baseline brain imaging by CT or MRI no more than 30 days prior to stenting (recommended by IAC)
- Carotid stenting is performed by 2 physicians
- Patient is instructed to HOLD antihypertensive medications the morning of stent procedure (hypotension may occur as a result of baroreceptor stimulation)
- Patient will have NIH Stroke Scale & Modified Rankin Score completed PRIOR to procedure and placed in chart (this will be done by APP)

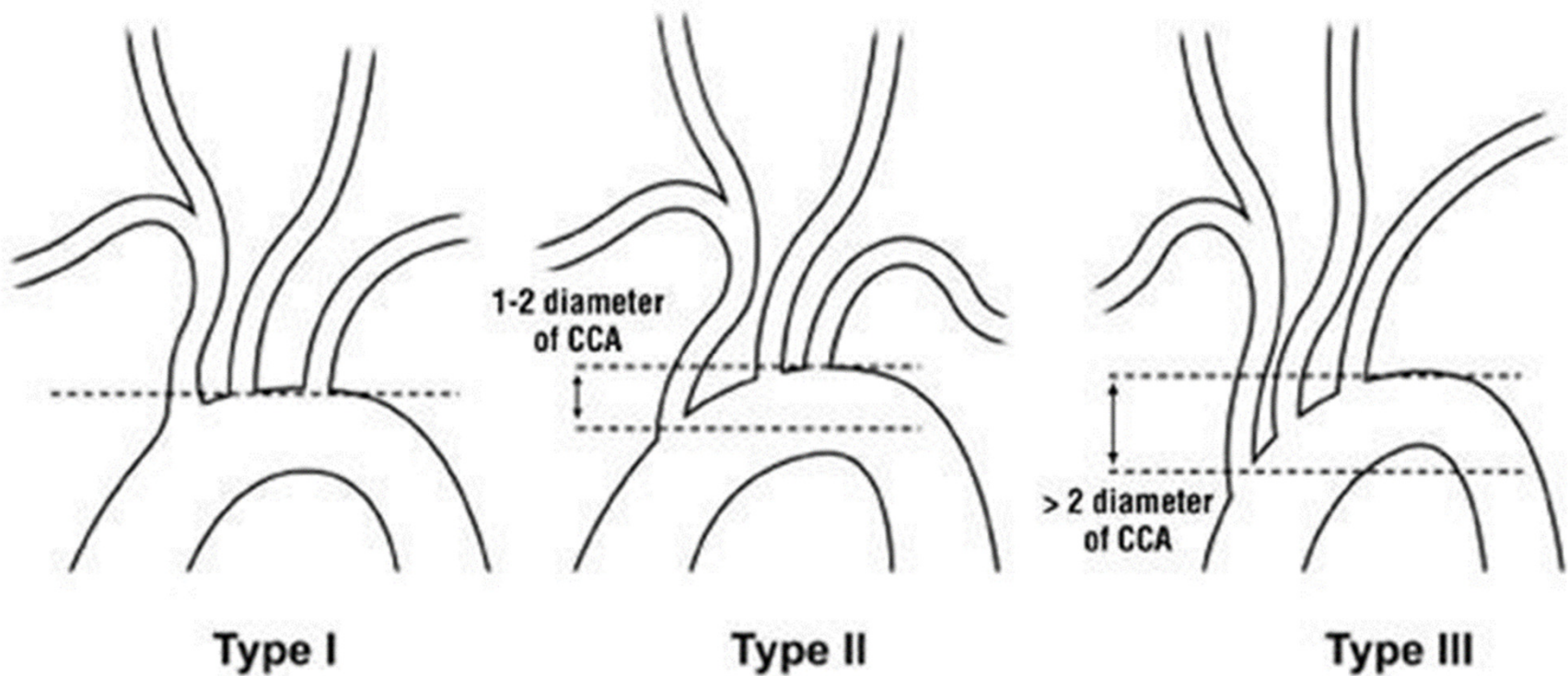
Procedure Details

- Patient is awake. They will be asked to squeeze object placed in each hand at times during the procedure to check neuro status
- Due to baroreceptor stimulation during the procedure, hypotension may occur. Neosynephrine and atropine available
- Embolic protection device. MoMa, Spider
- stent placement
- Cerebrals are checked
- MD exam performed before patient leaves lab
- Patients may exit lab on neosynephrine gtt

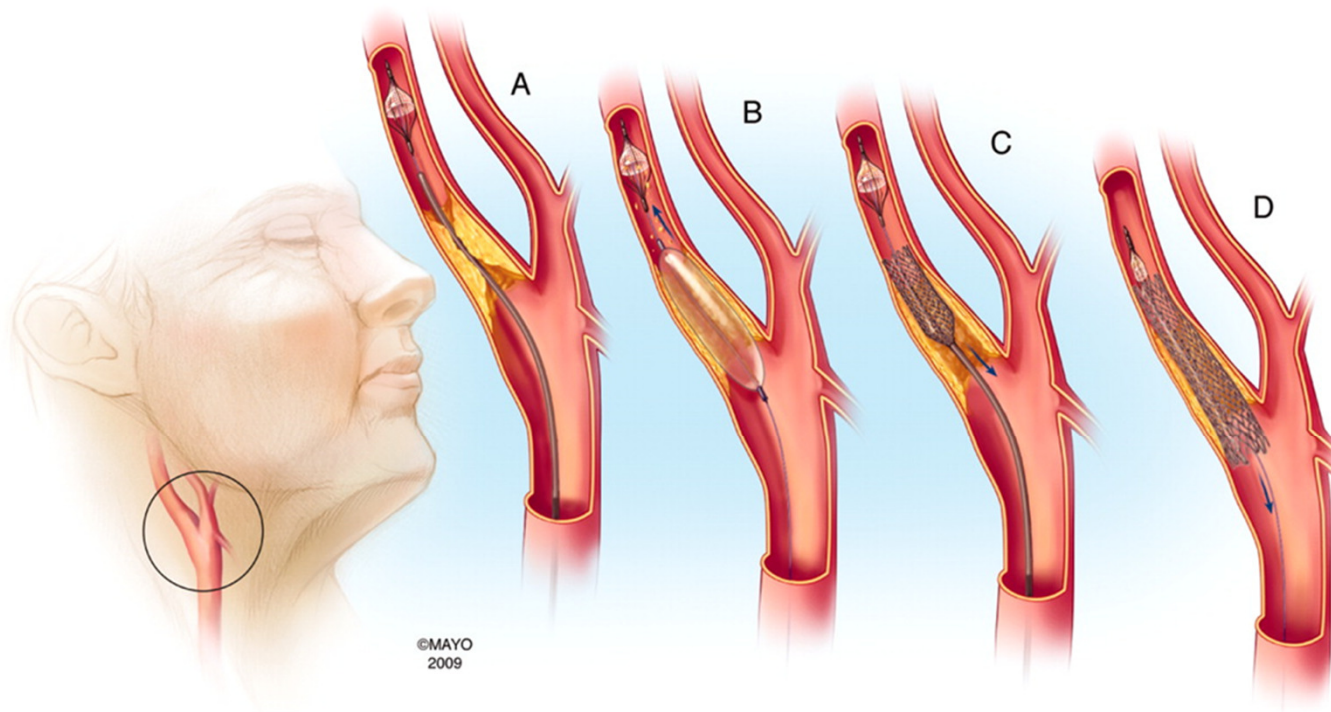
CAROTID ARTERY STENT TECHNIQUE



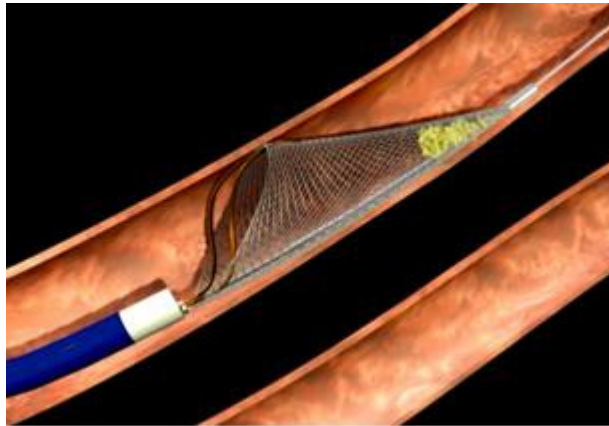
CAROTID ARTERY STENT TECHNIQUE



CAROTID ARTERY STENT TECHNIQUE

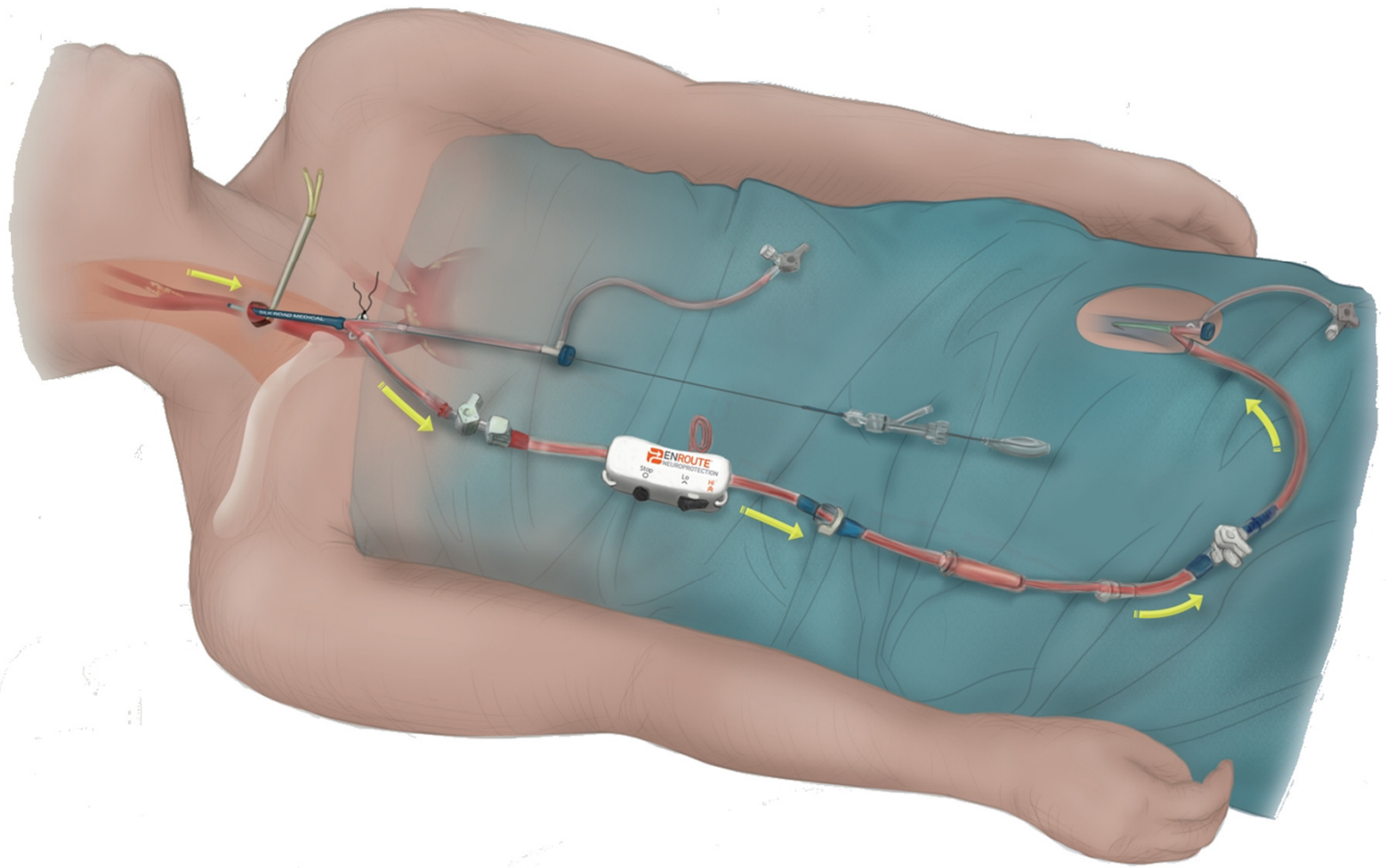


Spider



MoMa







<https://youtu.be/DHNmeuqSBq4>

Post Procedure Care

- Monitor closely on 2 Heart. Neuro checks, groin checks, BP monitoring per protocol
- NIH Stroke Scale and Modified Rankin Score performed APP and placed in chart
- Dual antiplatelet medications are required
- Continue blood pressure support as needed
- If neosynephrine is not weaned off in next 6H notify MD so PO Sudafed can be started. This will allow for weaning of gtt and prepare for discharge
- If patient is hypertensive, sbp >150, notify MD. Pt is at risk of intracranial hemorrhage
- **NO SAME DAY DISCHARGE**
- NIH Stroke Scale and Modified Rankin score day of discharge and placed in chart

Post Discharge Care

- Usual post angiogram groin care and restrictions
- Patient may be sent home on po Sudafed to maintain blood pressure. Monitor blood pressure closely and resume home meds per discharge instructions. APP communicate with office RN. Post discharge phone call to patient may be required.
- f/u carotid duplex imaging at 21-30 days post carotid stent
- f/u appointment with APP in office at 21-30 days post carotid stent. NIH Stroke Scale and Modified Rankin Score will be completed and placed in chart (this is required for PVI Registry)
- Patient should undergo **at least** annual surveillance imaging

Conclusions

- Stroke is an important cause of morbidity and mortality.
- TIA is a common precursor of stroke that is often not reported by patients to their physicians.
- Carotid artery disease is a common cause of ischemic stroke.
- More recent studies confirm that carotid artery stenting is a viable less invasive option to be considered as an alternative to carotid endarterectomy surgery for many patients.
- OHI's skilled and experienced interventionalists can offer a broader range of patients a safe, and minimally invasive procedure to achieve carotid revascularization.

Thank You

