

TRAINING AND CREDENTIALING for carotid stenting

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Fundamental premise

Carotid stenting is one of the most dangerous procedures routinely performed in a hospital

5-10% stroke and death in reported trials:

5.8% S/D/MI in ASX patients in **SAPPHIRE**

10% S/D in one year

**There is usually one
way to do something
right**

***There are a thousand
ways to really screw up!***

Why is training for carotid stenting an “issue”?

- **STROKE** is the worst complication in medicine
- Carotid Stenting is a predictable cause of stroke/death
 - *Results range from 4% Stroke/Death to >12%*
- *Complications are far more serious than for peripheral interventions or for coronary interventions*
- Rescue is far more complicated
- Procedural technique is more complicated than for typical peripheral or routine coronary interventions

Training issues

- **Just** Diagnostic Cerebral angiograms
 - Are 50 enough to be competent **ON YOUR OWN**?
 - Can you learn it all from a textbook?
 - Can you learn enough on a simulator
 - **Can you be competent with 25 if you are an “old and wise” stroke neurologist?**
 - “Old and Wise” Vascular surgeon?**
 - “Old and Wise” Cardiologist?, Radiologist?**
- What is hyperperfusion?
- What is blood brain barrier?
- Where is Broca’s area?
- What is Wernicke’s area?
- What does the anterior choroidal artery do?
- What is cerebral perfusion pressure?

Can you be competent to treat a brain disease if you have ZERO brain training?

- “Brain training”
 - Neuroanatomy
 - Neuropathophysiology
 - Cerebrovascular hemodynamics
 - Neuroradiology
 - Neurology
 - Neurosurgery
 - Neuro-angiography
 - Neuro - nuclear medicine
 - Carotid and transcranial Doppler

All Radiologists have written and oral boards in neuroradiology, ultrasound, Nuclear medicine, Neuroanatomy, cerebrovascular pathophysiology, etc.

COCATS

Core Cardiology Training Statement

- REQUIRED for *diagnostic* coronary
 - 8 months dedicated formal cath lab experience
 - 300 diagnostic coronary angiograms
- REQUIRED for *interventional* cardiology
 - 20 months dedicated cath lab training
 - 300 DX coronaries BEFORE training in interventional cardiology
 - 250 coronary interventions/stents before credentialing in interventional cardiology

Does it make sense to be competent with *diagnostic angiography* before you do *intervention* of ANY kind?

Should someone just do a couple of dozen endarterectomies before learning how to *sew up a cut*?

Current requirements for training

- American Academy of Neurology
 - **100** cases just to do diagnostic cerebral angiography
- ACC - **diagnostic** coronary angio
 - **300** diagnostic coronary angiograms
- ACC - **interventional** training
 - **300** DX cases before beginning training
 - **250** interventional coronary procedures AFTER DX'c
- AHA/SIR/SVS peripheral **diagnostic** angiography
 - **100** diagnostic peripheral angiograms in **any** particular vascular bed
- **ASITN, AANS, ASNR, Joint Section, CNS, SIR**
 - **100 diagnostic** cerebral angiograms before beginning training in cervicocerebral intervention

Current requirements for training

new ACC, SVS, etc

- Diagnostic carotids
 - Participate in 30 cases
 - ***Primary operator in 15 cases***
- Carotid Stents
 - ***15 cases***
- Diagnostic cases can be acquired at same time as stent cases; indeed, due the opposite carotid and you have all 30!

Sample of proposed vascular surgery training program

- ***Take an Experienced NeuroInterventionist***
 - Trained in **Neurology, Radiology, Neuroradiology,**
 - expert in stroke evaluation, imaging, clinical diagnostic evaluation, emergency stroke therapy, blah, blah
 - Managed NeuroICU patients
- ***Participate in 30 carotid endarterectomies, with 15 being primary operator.....***

VOILA!!!!

I am a vascular surgeon!

Training components

Cognitive

- Neuroanatomy, cerebrovascular hemodynamics, normal variants, circle of Willis variants, vasculopathies
- Where is the internal capsule?
- What supplies the thalamus? What does the thalamus do?
- Stroke syndromes
- What is “hyperperfusion syndrome”?
 - No such thing in the heart
 - What is the treatment?
- What is blood brain barrier breakdown?
 - How do you treat it?
 - No such thing in the heart
- What is the normal A-V transit time for brain?

Training components

Technical

- What is a JB-1 catheter?
- Proper use of *neuro* catheters, guidecatheters, guidewires, flush systems
- ***Why are Simmons catheters rarely used by contemporary neurointerventionists?***
- Air emboli, not uncommon in coronary and peripheral intervention, is a disaster in cerebral vasculature
- Exchange wire/guidecatheter use requires different skills than direct selective guide catheter use; ie coronary
- What is a flush-line air filter?

Where is the science for carotid training? Evidence based.....

- Greatly increased stroke rates (>300%) for simple diagnostic cerebral angiography by **fellows** in training and by **non-specialty-trained physicians**^{1,2}
- Huge learning curve for carotid stenting even when performed by enormously experienced interventional cardiologists³

1. Balduf LM, Langsfeld M, Marek JM, et al. **Complication rates of diagnostic angiography performed by vascular surgeons.** *Vasc Endovasc Surg* 2002;36:439-445.
2. Willinsky RA, Taylor SM, TerBrugge K, et al. Neurologic complications of cerebral angiography: prospective analysis of 2,899 procedures and review of the literature. *Radiology* 2003;227:522-528.
3. Vitek JJ, Roubin GS, Al-Mubarek N, New G, Iyer SS. Carotid artery stenting: Technical considerations. *AJNR*. 2000 Oct;21(9):1736-43.

Requirements for post-graduate training for carotid stenting for ANY experienced interventionalists: **ASITN, SIR, ASNR**

- **Complete cognitive knowledge**
- 100 *diagnostic* cerebral angiograms experience for an experienced angiographer/interventionist
- Experience: 25 non-carotid *stent* procedures
 - *OR 10 carotid stents with acceptable results*
- Participation in a true “hands-on” course with REAL DEVICES of at least 16 hours
- Substantiation in writing of all necessary knowledge
- **4 proctored Carotid stent cases AFTER training**
- Maintenance of competency with CME

Training, Competency, and Credentialing Standards for Diagnostic Cervicocerebral Angiography, Carotid Stenting, and Cerebrovascular Intervention

A Joint Statement from the:
AAN, AANS, ASNR, ASITN, CNS,
CV Section of AANS/CNS, SIR

AJNR - Nov/Dec, 2004
NEUROLOGY - January, 2005
JVIR - December, 2004
RADIOLOGY- January, 2005

Training Statement from the NEUROSCIENCES

- Cognitive neuro training is **mandatory - 6 months**
 - *In a formal ACGME training program*
- Diagnostic angiography experience is **mandatory**
 - 100 cases
- Credentialing in cerebral angiography BEFORE training for carotid stenting is **mandatory**
- ***The carotid stent training principles of the SIR/ASITN/ASNR are endorsed and confirmed****
- Credentialing for one indication-ischemia-is unacceptable
- Simulator training alone is unacceptable

* JVIR, Oct, 2003

Thank you!