Current Training, Credentialing, and Facilities Guidelines for Carotid Stenting & National Carotid Outcomes Database: Rationale and Status Update

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Disclosures

Abbott
Bard
BSC
Cordis
Guidant
Medtronic

• Research and training support
• Consultant/advisor
Carotid Stenting

Unique programmatic issues

Why is this procedure different from all other procedures?

Organ system and Disease state
- Unique anatomy, pathol, access, response to intervention

Procedure
- New skill sets and different equipment
- Unique access considerations
- High risk; no room for error… *Little* errors cause a *lot* of hurt
- Must be “on” all the time…never let guard down…

Milieu
- Multidisciplinary disease
- many specialties traditionally involved and have “stake”
- unprecedented level of peer review and scrutiny
- unique opportunity to set quality standards and benchmarks which cross specialty lines
Declining Incidence of Strokes - Roubin, Iyer, Vitek, et al

Combined effects of learning curve, better devices and distal protection

<table>
<thead>
<tr>
<th>Year</th>
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## Carotid Training & Credentialing Documents

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<td>10 cases or 4 w/16 hr training</td>
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<td>ACC/ACP/SCAI/SVS/SVMB</td>
<td>Competency Document on PVD (section on carotid)</td>
<td>2004</td>
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Training and Credentialing Documents

Society Recommendations

- Neurovascular Coalition 2003
- ACC/ACP/SCAI/SVS/SVMB PVD 2004
- SCAI/SVS/SVMB Carotid 2005
- Neurovascular Coalition 2005
Quality Improvement Guidelines for the Performance of Cervical Carotid Angioplasty and Stent Placement

Developed by a Collaborative Panel of the American Society of Interventional and Therapeutic Neuroradiology, the American Society of Neuroradiology, and the Society of Interventional Radiology

John D. Barr, MD, John J. Connors, III, MD, David Sacks, MD, Joan C. Wojak, MD, Gary J. Becker, MD, John F. Cardella, MD, Bohdan Chopko, MD, PhD, Jacques E. Dion, MD, Allan J. Fox, MD, Randall T. Higashida, MD, Robert W. Hurst, MD, Curtis A. Lewis, MD, MBA, Terence A.S. Matalon, MD, Gary M. Nesbit, MD, J. Arliss Pollock, MD, Eric J. Russell, MD, David J. Seidenwurm, MD, and Robert C. Wallace, MD, for the ASITN, ASNR, and SIR Standards of Practice Committees

Abbreviations: ACAS = Asymptomatic Carotid Atherosclerosis Study, ACR = American College of Radiology, AHA = American Heart Association, ASITN = American Society of Interventional and Therapeutic Neuroradiology, ASNR = American Society of Neuroradiology, CAS = carotid angioplasty and stent placement, CEA = carotid endarterectomy, CREST = Carotid Revascularization: Endarterectomy vs. Stent Trial, NASCET = North American Symptomatic Carotid Endarterectomy Trial, NIHSS = National Institutes of Health Stroke Scale, SIR = Society of Interventional Radiology
2. The requirements for meeting the qualifications listed in IV.B.1 may be met by obtaining the following training and experience.

2.1. Indications for CAS:

1. Acute ischemia of the leg or foot requiring immediate revascularization.
2. Presence of a high-grade stenosis or occlusion in a major artery that is not amenable to endovascular therapy.
3. Presence of a dissection or pseudoaneurysm that requires endovascular repair.

2.2. Contraindications to CAS:

1. Presence of a severe vascular malformation.
2. Presence of a severe aortic or femoral aneurysm.
3. History of severe allergy to contrast material.

3. Technical Requirements for the Procedure:

1. General requirements for the procedure.
2. Specific requirements for the procedure.
3. Equipment requirements for the procedure.
4. Personnel requirements for the procedure.

4. Indications for cervical angioplasty and stent placement:

1. Presence of a severe stenosis or occlusion in the carotid artery.
2. Presence of atherosclerotic plaques in the carotid artery.
3. Presence of a dissection or pseudoaneurysm in the carotid artery.

5. Contraindications to cervical angioplasty and stent placement:

1. Presence of a severe vascular malformation.
2. Presence of a severe aortic or femoral aneurysm.
3. History of severe allergy to contrast material.

6. Procedure guidelines for cervical angioplasty and stent placement:

1. Procedure steps for cervical angioplasty and stent placement.
2. Post-procedure care for cervical angioplasty and stent placement.
3. Follow-up guidelines for cervical angioplasty and stent placement.

7. Quality Improvement:

1. Guidelines for cervical angioplasty and stent placement:
2. Guidelines for cervical angioplasty and stent placement.
3. Guidelines for cervical angioplasty and stent placement.
4. Guidelines for cervical angioplasty and stent placement.
5. Guidelines for cervical angioplasty and stent placement.

8. Technical aspects of cervical angioplasty and stent placement:

1. Technical considerations for cervical angioplasty and stent placement.
2. Technical considerations for cervical angioplasty and stent placement.
3. Technical considerations for cervical angioplasty and stent placement.
4. Technical considerations for cervical angioplasty and stent placement.
5. Technical considerations for cervical angioplasty and stent placement.

9. Performance Improvement:

1. Performance indicators for cervical angioplasty and stent placement.
2. Performance indicators for cervical angioplasty and stent placement.
3. Performance indicators for cervical angioplasty and stent placement.
4. Performance indicators for cervical angioplasty and stent placement.
5. Performance indicators for cervical angioplasty and stent placement.

10. Management and supervision of patients:

1. Management of patients undergoing cervical angioplasty and stent placement.
2. Management of patients undergoing cervical angioplasty and stent placement.
3. Management of patients undergoing cervical angioplasty and stent placement.
4. Management of patients undergoing cervical angioplasty and stent placement.
5. Management of patients undergoing cervical angioplasty and stent placement.

11. Conclusion:

1. Conclusion for cervical angioplasty and stent placement.
2. Conclusion for cervical angioplasty and stent placement.
3. Conclusion for cervical angioplasty and stent placement.
4. Conclusion for cervical angioplasty and stent placement.
5. Conclusion for cervical angioplasty and stent placement.
a. Performance (under the supervision of a qualified physician and with at least 50% performed as the primary operator) of at least 200 diagnostic cervicocerebral angiograms with documented acceptable indications and outcomes for physicians with no prior catheter experience (4,139), or at least 100 diagnostic cervicocerebral angiograms with documented acceptable indications and outcomes for physicians with experience sufficient to meet the AHA requirements for peripheral vascular interventions (124).
b. Arterial stent experience as either:

1. 25 non-carotid stent complete procedures, plus attendance at and completion of a "hands-on" course in performance of CAS, plus performance and completion of at least four successful and uncomplicated CAS procedures as principal operator under the supervision of an on-site qualified physician; this must be a comprehensive course in which the attendees earn at least 16 hours of AMA category I continuing medical education credit.

OR

2. Ten consecutive CAS procedures as principal operator under supervision of a qualified physician, defined as a physician who has already met the qualifications of section IV with acceptable indications and outcomes.

a. Performance (under the supervision of a qualified physician and with at least 50 procedures performed as the primary operator) of at least 200 diagnostic carotid angiograms with documented acceptable indications and outcomes for patients with or without prior carotid experience (4,139).

b. Diagnostic angiograms interpreted accurately and concisely with sufficient diagnostic accuracy and without complications.

c. Arterial stent experience as either:

1. 25 non-carotid stent complete procedures, plus attendance at and completion of a "hands-on" course in performance of CAS, plus performance and completion of at least four successful and uncomplicated CAS procedures as principal operator under the supervision of an on-site qualified physician; this must be a comprehensive course in which the attendees earn at least 16 hours of AMA category I continuing medical education credit.

OR

2. Ten consecutive CAS procedures as principal operator under supervision of a qualified physician, defined as a physician who has already met the qualifications of section IV with acceptable indications and outcomes.

3. Maintenance of competency through participation in a quality improvement program that monitors and improves the following:
   a. Indicators of performance.
   b. Indicators of outcomes.
   c. Preprocedure and postprocedure.


5. Anatomy, physiology, and pathology of the cardiovascular system.

6. Pharmacology of contrast agents and cardiac, anticoagulant, and antihypertensive drugs and recognition and treatment of adverse reactions to these substances.

7. Recognition and treatment of cardiac arrhythmias associated with CAS.

8. Technical aspects of performing CAS.

9. Recognition of any concomitant abnormality or complication related to the CAS procedure.

10. Postprocedural patient management, particularly the recognition and initial management of complications and maintenance of competency to continue performance of procedures with acceptable outcomes. Additional numbers of sufficient numbers of CAS procedures to maintain success and complication rates as outlined below.

11. Participation in courses that provide continuing education for advances in CAS.

12. Continuing education should be in accordance with the ACR standard for Continuing Education.

ANNEXES TO THE GUIDELINES

Requirements for technical operations and equipment necessary to ensure successful performance of CAS. These include angiographic facilities, angiographic monitoring equipment, and support personnel. The necessary requirements are:

- An angiographic suite with sufficient space to accommodate patient-monitoring equipment, anesthesia equipment, while leaving adequate room for the circulating staff to move without contaminating the sterile field.
- A high-resolution image intensifier and imaging chain with the ability to acquire and store images digitally, imaging and recording must be consistent with the as low as reasonably achievable (ALARA) radiation safety guidelines.
Neurovascular Coalition

American Academy of Neurology
American Association of Neurological Surgeons
Society of Interventional and Therapeutic Neuroradiology
American Society of Neuroradiology
Congress of Neurological Surgeons
AANS / CNS Cerebrovascular Section
Society of Interventional Radiology
Training, competency, and credentialing standards for diagnostic cervicocerebral angiography, carotid stenting, and cerebrovascular intervention

A Joint Statement from the American Academy of Neurology, the American Association of Neurological Surgeons, the American Society of Interventional and Therapeutic Neuroradiology, the American Society of Neuroradiology, the Congress of Neurological Surgeons, the AANS/CNS Cerebrovascular Section, and the Society of Interventional Radiology* 

John J. Connors III, MD; David Sacks, MD; Anthony J. Furlan, MD; Warren R. Selman, MD; Eric J. Russell, MD; Philip E. Stieg, PhD, MD; and Mark N. Hadley, MD; for the NeuroVascular Coalition Writing Group†

Connors et al., Neurology (spring 2005)
4) All collaborating neuroscience societies recommend appropriately supervised cervicocerebral angiography training and resultant credentialing with an accumulated total of 100 diagnostic cervicocerebral angiograms before postgraduate training in cervicocerebral interventional procedures, including carotid stenting, as described herein.\textsuperscript{29,97}

5) All collaborating neuroscience societies endorse the principles of training and quality assurance espoused in the multisociety Quality Improvement Guidelines for the Performance of Carotid Angioplasty and Stent Placement,\textsuperscript{113} which include a defined training pathway for any qualified practitioner for carotid stent training.
Consensus of the collaborating neuroscience societies

1) All collaborating neuroscience societies are of the unanimous opinion that the safety of the patient is paramount.

2) Defined formal training and experience in both the cognitive and technical aspects of the neurosciences are essential for the performance and interpretation of diagnostic and therapeutic cervical and cerebrovascular procedures. Therefore, in addition to procedural technical experience requirements, a minimum of 6 months of formal cognitive neuroscience training is required in an approved program in radiology, neuroradiology, neurosurgery, neurology, and/or vascular neurology for any practitioner performing cervical carotid interventional therapy, including carotid stenting. This minimum neuroscience training recommendation applies to all practitioners, whether from specialties with or without dedicated training in the clinical neurosciences as part of their ACGME-approved residency programs.

“6 months of formal cognitive neuroscience training is required...”

Connors et al., Neurology (spring 2005)
Credentialing for Carotid Stenting

*Position of Neurovascular Coalition*

- 100 diagnostic cervico-cerebral angiograms with appropriate indications
- 6 month formal cognitive neuroscience training
- No mention in most recent documents of any need for experience with stents, distal protection, or carotid stent training
Worldwide Registry

Carotid Stent by Physician Specialty

- Cardiology: 63%
- Radiology: 25%
- Surgery: 12%

Wholey and Wholey; Cath and Cardiovascular Intervent; 1998.
Who should do Carotid Intervention

**Principles**

- Individuals with...
  - Knowledge of disease state/natural history, therapeutic options, etc.
  - Appropriate skills (catheter and clinical)
  - Commitment to obtain appropriate training and credentials
  - Knowledge of limitations

- **Restrictions should not be Specialty-based**
ACC/ACP/SCAI/SVMB/SVS Clinical Competence Statement on Vascular Medicine and Catheter-Based Peripheral Vascular Interventions

A Report of the American College of Cardiology/American Heart Association/American College of Physicians Task Force on Clinical Competence (ACC/ACP/SCAI/SVMB/SVS Writing Committee to Develop a Clinical Competence Statement on Peripheral Vascular Disease)

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GREGORIO A. SICARD, MD
CHRISTOPHER J. WHITE, MD, FACC, FSCAI
Physician seeking training for Carotid Stenting

• Multiple different clinical backgrounds
• Variable skill level in catheter-based techniques
• Variable familiarity with carotid/cerebral circulation
• Different cognitive knowledge base re: stroke and cerebrovascular disease
SCAI/SVMB/SVS CLINICAL COMPETENCE STATEMENT

Clinical Competence Statement on Carotid Stenting: Training and Credentialing for Carotid Stenting—Multispecialty Consensus Recommendations

A Report of the SCAI/SVMB/SVS Writing Committee to Develop a Clinical Competence Statement on Carotid Interventions

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GARY S. ROUBIN, MD, PhD
BONNIE H. WEINER, MD
CHRISTOPHER J. WHITE, MD
Skills Required for Carotid Intervention (Regardless of specialty)

• Cognitive
• Technical/Procedural
• Clinical
Cognitive Requirements

Table 1. Cognitive Requirements for Performance of Carotid Stenting

Cognitive elements including the fund of knowledge regarding cerebrovascular disease, its natural history, pathophysiology, diagnostic methods, and treatment alternatives.

I) Pathophysiology of carotid artery disease and stroke.
   a) Causes of Stroke
      i. Embolization (cardiac, carotid, aortic, other)
      ii. Vasculitis
      iii. Arteriovenous malformation
      iv. Intracranial bleeding (subdural, epidural)
      v. Space-occupying lesion
   b) Causes of carotid artery narrowing
      i. Atherosclerosis
      ii. Fibromuscular dysplasia
      iii. Spontaneous dissection
      iv. Other
   c) Atherogenesis (pathogenesis and risk factors)

II) Clinical manifestation of stroke
   a) Knowledge of stroke syndromes (classic and atypical)
   b) Distinction between anterio and posterior circulation events

III) Natural history of carotid artery disease

IV) Associated pathology (e.g., coronary and peripheral artery disease)

V) Diagnosis of stroke and carotid artery disease
   a) History and physical examination
      i. Neurologic
      ii. Non-neurologic (cardiac, other)
   b) Non-invasive imaging and appropriate use thereof
      i. Duplex ultrasound
      ii. MRA
      iii. CTA

VI) Angiographic anatomy (arch, extracranial, intracranial, basic collateral circulation, common anatomic variants, and non-atherosclerotic pathologic processes)

VII) Knowledge of alternative treatment options for carotid stenosis and their results (immediate success, risks, and long-term outcome)
   a) Pharmacotherapy (e.g., anti-platelet agents, anticoagulation, lipid-lowering agents)
   b) Carotid endarterectomy
      i. Results from major trial (NASCET, ACAS, ECST, ACST)
      ii. Results in patients with increased surgical risk
   c) Stent revascularization
      i. Results with and without distal embolic protection

VIII) Case selection
   a) Indications and contraindications for revascularization to prevent stroke
   b) High risk criteria for carotid endarterectomy
   c) High risk criteria for percutaneous intervention

IX) Role of post-procedure follow up and surveillance

*In addition to baseline cognitive skills encompassed in the Competency documents (6).
Training in Carotid Intervention

*Cognitive Component*

- Knowledge of cerebrovascular disease, anatomy/pathophysiology of target organs, natural hx of disease
- Appropriate diagnostic testing, interpretation of results
- Therapeutic alternatives
“Cognitive knowledge base”
When is CAS relatively or absolutely contraindicated

- Large (pedunculated) Thrombus
- Complex lesion
- String sign or Total occlusion
- Heavy calcification
- Distal ICA severely tortuous or diffusely diseased
- Arch severely unfolded, making access impossible
- Arch severely diseased with friable plaque
Table 2. Technical Requirements for Performance of Carotid Stenting

Minimum number of procedures to achieve competence
I) Diagnostic cervico-cerebral angiograms - 30 (≥ half as primary operator)†
II) Carotid stent procedures - 25 (≥ half as primary operation)†

Technical elements for competence in both diagnostic angiography and interventional techniques
I) High level of expertise with antiplatelet therapy and procedural anticoagulation
II) Angiographic skills
   a) Vascular access skills
   b) Selection of guidewires and angiographic catheters
   c) Appropriate manipulation of guidewires and catheters
   d) Use of “closed system” manifold
   e) Knowledge of normal angiographic anatomy and common variants
   f) Knowledge of Circle of Willis and typical/atypical collateral pathways
   g) Proper assessment of aortic arch configuration, as it affects carotid intervention
   h) Familiarity with use of angulated views and appropriate movement of the X-ray gantry
III) Interventional skills
   a) Guide catheter/sheath placement
   b) Deployment and retrieval of embolic protection devices
   c) Pre- and post-dilation
   d) Stent positioning and deployment
IV) Recognition and management of intra-procedural complications
   a) Cerebrovascular events
      1. Stroke or cerebrovascular ischemia
      2. Embolization
      3. Hemorrhage
      4. Thrombosis
      5. Dissection
      6. Seizure and loss of consciousness
   b) Cardiovascular events
      1. Arrhythmias
      2. Hypotension
      3. Hypertension
      4. Myocardial ischemia/infarction
   c) Vascular access events
      1. Bleeding
      2. Ischemia
      3. Thrombosis
IV) Management of vascular access
   a) Proper sheath removal and attainment of hemostasis
   b) Closure device utilization

*In addition to technical skills encompassed in the Competency document (6). †Angiograms and stenting procedures may be performed in the same sitting (e.g., in the same patient), provided that one performs 15 angiograms as primary operator before performing the first stent as primary operator.
CEREBRAL ANGIOGRAPHY

• To achieve and ensure competency in the safe performance of cervico-cerebral angiography, interventionalists with proper credentials and demonstrated expertise in non-cerebrovascular vessels can achieve the required level of technical skill by performing thirty (30) supervised angiograms, half as primary operator, in a supervised setting.

• This recommendation acknowledges the transferable nature of basic and advanced catheter skills acquired in other vascular beds. Prior to performance of these 30 angiograms, the trainee should have acquired extensive knowledge of neurovascular anatomy and pathology through study of appropriate textbooks and case review of angiograms.
CAROTID STENTING

- Interventionalists training in carotid stenting must perform a minimum of 25 patient procedures in a supervised setting, half as primary operator.
  - “Supervision” implies that the mentor is scrubbed alongside the trainee; “primary operator” implies that, throughout the entire procedure, the trainee is personally directing the guidewires, placing the sheath, positioning and retrieving the distal protection device and balloons, and deploying the stent.
  - Prior to functioning as a primary stent operator, the trainee must have performed at least 15 diagnostic cervico-cerebral angiograms as primary operator.
Clinical Skills

Table 3. Clinical Requirements for Performance of Carotid Stenting

<table>
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<tr>
<th>Clinical elements, including the ability to manage inpatients and outpatient care</th>
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<tr>
<td>I) Determine the patient’s risk/benefit for the procedure</td>
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<tr>
<td>II) Outpatient responsibilities</td>
</tr>
<tr>
<td>a. Adjust medications pre-procedure</td>
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<td>b. Counsel patient and family</td>
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<tr>
<td>III) Inpatient responsibilities</td>
</tr>
<tr>
<td>a. Admit patients (privileges required) and write orders</td>
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<tr>
<td>b. Obtain informed consent for procedures</td>
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<tr>
<td>c. Provide pre- and post-procedure hospital care</td>
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<tr>
<td>i. Neurological evaluation pre and post-procedure</td>
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<tr>
<td>ii. Post-procedure pharmacotherapy</td>
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<tr>
<td>iii. Monitoring of hemodynamic and cardiac rhythm status</td>
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<tr>
<td>IV) Coordinate post-stent surveillance and clinical outpatient follow-up</td>
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</table>

*In addition to clinical skills encompassed in the Competency document (6).
Training in Carotid Intervention

**Clinical Component**

**General Skills**

- Patient management, physical examination and evaluation of influence of disease on patient
- Inpatient admission, work-up and management, ability to evaluate and treat complications
- Interpretation of diagnostic tests
- Risk-benefit analysis
Clinical Skills for Carotid Stenting: Complex hemodynamic management

- Hypertension
  - Rx vasodilators (avoiding bleed due to reperfusion hyperemia)
- Hypotension and bradycardia at time of balloon inflation, especially post-dilating stent
  - Rx Fluids and Atropine
- Persistent hypotension/bradycardia post procedure
Pathways to credentialing

• Fellowship Programs (future)
• Didactic course work
  – THIS Course, SCAI live and web-based courses; VIVA
• Observation of cases
• Proctorship
• Partnering
• Industry FDA-mandated training
• SIMULATION Training
SIMULATOR TRAINING

• To assist physicians with differing backgrounds and skills to reach a common benchmark of proficiency, metric-based simulation may be incorporated into training.

• To provide skills acquisition in an objective manner, removing specialty biases from the training process.
“...the cost of a single tragic event can far exceed the cost of the simulation training that may have prevented it!”

-David Holmes, M.D.
STAFF TRAINING: the team
Role of Industry

• To ensure familiarization with specific equipment as required by the FDA, successful completion of an industry-sponsored certification course may be required.

• Industry-sponsored programs should assist the individual physician in completion of the requirements suggested above to achieve competency, while not supplanting them.

• The industry sponsored training may include didactic cognitive training, metric-based simulator training to proficiency, and proctoring.
Carotid Stent Credentialing

Credentialing is a process by which hospitals determine physician competency and establishes permission to perform particular procedures within that institution.

LOCAL ISSUE!
Facility Credentials

**CMS: “High Quality Systems In Place”**

- **High Resolution Imaging Equipment**
  - DSA
- **Advanced Hemodynamic Monitoring**
  - Real-time physiologic, hemodynamic and cardiac rhythm
- **Recovery Area**
  - Capable of access site management
- **Emergency Management**
  - Availability and skill in use of vasoactive drugs and resuscitation procedures
- **Skilled Allied Health Professionals**
  - Formal training and experience evaluating patients pre- and post-carotid artery revascularization
- **QA Systems Well-Defined and Operational**
  - Prospective collection of outcomes data for each carotid intervention
  - Thresholds for peer review and adjudication based on agreed upon national standards
Quality Assurance

- Independent assessment of carotid stent outcomes by a neurologist or other qualified NIH Stroke Scale certified individual is required.

- A systematic review of results from individual operators at standard intervals, i.e. after the initial 20 cases and quarterly thereafter.

- We support the creation of a mandatory national multi-specialty registry database for reporting of outcomes and assessment of ongoing institutional and individual operator competence.
Implications of the CMS Coverage Decision on Your Clinical Practice

September 28, 2005

Ralph Brindis, MD, MPH
Chief Medical Officer, ACC-NCDR®
Multi-Specialty Workgroup

Objective 1
Determine standards for a national CAS Registry

Objective 2
Determine core elements and definitions

ACC Facilitated
Challenges at the Local Level

**Data Collection**
- Burden on Facilities to Collect Data
- Feasibility for Facilities to Fund Costs

**Resource Constraints**

**Time Constraints**
Launch VIVA September 2005!!
Fully Integrated Registries

Linked data elements to reduce redundant data collection

CathPCI Registry™

ICD Registry™

Carotid Stent Registry™

In partnership with the Heart Rhythm Society
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<th><strong>/<strong><strong>/</strong></strong></strong>_</th>
<th>Date of Procedure&lt;sup&gt;3010&lt;/sup&gt;:</th>
<th><strong>/<strong><strong>/</strong></strong></strong>_</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Insurance Payor&lt;sup&gt;3020&lt;/sup&gt;:</td>
<td>Government; Commercial; HMO; Non-U.S. Insurance; None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>→ if Government, Type&lt;sup&gt;3030&lt;/sup&gt;:</td>
<td>Medicare; Medicaid; TriCare; VA Health Plan; Federal Employee Insurance</td>
<td></td>
<td></td>
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<tr>
<td>Secondary Insurance Payor&lt;sup&gt;3040&lt;/sup&gt;:</td>
<td>Government; Commercial; HMO; Non-U.S. Insurance; None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>→ if Government, Type&lt;sup&gt;3050&lt;/sup&gt;:</td>
<td>Medicare; Medicaid; TriCare; VA Health Plan; Federal Employee Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary&lt;sup&gt;3060&lt;/sup&gt;:</td>
<td>________________</td>
<td>Auxiliary&lt;sup&gt;3070&lt;/sup&gt;:</td>
<td></td>
</tr>
</tbody>
</table>

### D. HISTORY AND RISK FACTORS:

#### General History & Risk Factors

<table>
<thead>
<tr>
<th>Height&lt;sup&gt;4000&lt;/sup&gt;:</th>
<th>____ (cm)</th>
<th>Weight&lt;sup&gt;4010&lt;/sup&gt;:</th>
<th>____ (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Tobacco Use&lt;sup&gt;4020&lt;/sup&gt;:</td>
<td>Current; Former; Never</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes&lt;sup&gt;4030&lt;/sup&gt;:</td>
<td>No; Yes; → if Yes, Diabetes Control&lt;sup&gt;4040&lt;/sup&gt; (Choose highest level only):</td>
<td>None; Diet; Oral; Insulin</td>
<td></td>
</tr>
<tr>
<td>Hypertension&lt;sup&gt;4050&lt;/sup&gt;:</td>
<td>No; Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creatinine Level Baseline Pre-CAS&lt;sup&gt;4060&lt;/sup&gt;:</td>
<td>____ mg/dL</td>
<td></td>
<td></td>
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<tr>
<td>Current Dialysis Dependent Renal Failure&lt;sup&gt;4070&lt;/sup&gt;:</td>
<td>No; Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypercoaguable State&lt;sup&gt;4080&lt;/sup&gt;:</td>
<td>No; Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe Lung Disease&lt;sup&gt;4090&lt;/sup&gt;:</td>
<td>No; Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Oxygen Dependent&lt;sup&gt;4100&lt;/sup&gt;:</td>
<td>No; Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peripheral Arterial Disease&lt;sup&gt;4110&lt;/sup&gt; (Choose all that apply):</td>
<td>No; Yes-Lower Extremity; Yes-Renal; Yes-AAA; Yes-Other Non-Cerebrovascular</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyslipidemia&lt;sup&gt;4120&lt;/sup&gt;:</td>
<td>No; Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Cardiovascular History & Risk Factors

| Coronary Artery Disease<sup>4130</sup>: | No; Yes; → if Yes, Previous STEMI Date<sup>4140</sup>: | ____/____/_______ |
| Previous STEMI<sup>4140</sup>: | No; Yes; → if Yes, Previous STEMI Date<sup>4160</sup>: | ____/____/_______ |
| Previous NSTEMI: | No; Yes; → if Yes, Previous NSTEMI Date: | ____/____/_______ |
| Q Wave MI<sup>4150</sup>: | No; Yes |
| Current Angina<sup>4170</sup>: | No; Yes |
| Angina Type<sup>4180</sup>: | Stable Angina; Unstable Angina; |
| Previous CABG<sup>4190</sup>: | No; Yes; → if Yes, Date<sup>4200</sup>: | ____/____/_______ |
| Previous Percutaneous Coronary Intervention<sup>4210</sup>: | No; Yes; → if Yes, Date<sup>4220</sup>: | ____/____/_______ |
Online Data Entry Tool
Education and Training Support

- Training Manuals
- Annual User Group Meetings
- Workshops
- Webcasts
- Online Help Tools
How the ACC-NCDR® Program Works

1. **Hospital signs a participation agreement and pays annual fee**
   - **Hospital**
   - **CarotidStentRegistry™**

2. **Select a Certified Software Vendor or use ACC online**

3. **Submit Data quarterly**
   - **Submit**

4. **Receive quarterly benchmark reports**
   - **Receive**
Monitor key measures of performance

with quarterly online benchmark reports

Divided into three main reporting sections

– Key Performance Measures
– Quality and Utilization Indicators
– Detail Section
Carotid Stenting

*Multidisciplinary Team Approach*

- Eliminates most politics and “turf battles”
- Pooling of complementary skills
- May shorten the learning curve
- Facilitates optimal patient care
Stenting Rocks!

Great benefit of integrated approach to management
Incorporating CAS into Your Practice

• Designate 1-2 in practice who will do it
• Obtain appropriate training and credentialing
• Identify the team and install required facilities
• Track results with proper QA program and database

JUST DO IT... WELL!!!