How to Manage the Growing Demand for Stroke Interventionalists

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## Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

<table>
<thead>
<tr>
<th>Affiliation/Financial Relationship</th>
<th>Company</th>
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<tbody>
<tr>
<td>Grant/Research Support</td>
<td>Toshiba</td>
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<tr>
<td>Consulting Fees/Honoraria</td>
<td>Boston Scientific, Cordis, Abbott Vascular, Covidien</td>
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<tr>
<td>Major Stock Shareholder/Equity</td>
<td>Boston Scientific, Valor Medical, Claret Medical, Inc., Augmenix, Endomation, Silk Road, Ostial, Apama, StimSox, Photolitec, ValenTx, Ellipse, Axtria, NextPlain, MedinaMed, Ocular</td>
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Tremendous worldwide mortality impact

The 10 leading causes of death in the world 2012

- Heart disease: 173.7 million
- Cancer: 169.0 million
- Chronic lower respiratory diseases: 42.5 million
- Stroke: 37.9 million
- Unintentional injuries: 39.1 million
- Alzheimer’s disease: 24.7 million
- Diabetes: 21.6 million
- Influenza and pneumonia: 15.7 million
- Kidney disease: 13.4 million
- Suicide: 12.3 million

Figure 3. Age-adjusted death rates for the 10 leading causes of death in 2012: United States, 2011–2012

NOTE: Access data table for Figure 3 [PDF - 8 KB].
Preventable Deaths From Heart Disease & Stroke

At least 200,000 deaths from heart disease and stroke each year are preventable.*

More than half of preventable heart disease and stroke deaths happen to people under age 65.

African-Americans are nearly twice as likely as Caucasians to die from preventable heart disease and stroke.

*Preventable (avoidable) deaths are defined as those from ischemic heart disease, stroke, chronic rheumatic heart disease, and hypertensive disease in people under age 75, although changes in health habits and the health care system can reduce death among all ages.

Source: Adapted from: CDC. Preventable Deaths from Heart Disease & Stroke. Available at www.cdc.gov/vitalsigns/HeartDisease-Stroke/index.html.
Not enough Stroke Centers

Stroke Care Center at the Gates Vascular Institute

Emergency Stroke Care available 24 hours a day – 7 days a week

The Stroke Care Center team at the Gates Vascular Institute is ready 24 hours a day, 7 days a week to take care for stroke patients with:

- Renowned neurosurgeons and neurologists
- State-of-the-art technology for diagnosis and treatment
- Multidisciplinary team specially-trained in stroke care

If you or someone you know is experiencing stroke symptoms call 9-1-1 and get to Gates – The new Gates Vascular Institute.
Acute Ischemic Stroke Is the Most Prevalent Subtype

750,000 strokes per year in the United States

- Acute Ischemic Stroke: 87%
- Hemorrhagic Stroke: 13%
High economic burden on society

- Heart disease and stroke cost the nation $312.6 billion/year in health care costs and lost economic productivity.
Acute Ischemic Stroke Burden

- Third most common cause of death in industrialized nations
- The single most common reason for permanent adult disability
- Estimated direct and indirect cost of stroke in the US for 2009 - $$$ 68.9 billion
- WHO 2002 (World wide)
  - 15.3 million strokes per year
  - 5.5 million deaths every year
Evolving Landscape for Stroke

• Moving from era of REHABILITATION…

   In the past, few treatment options available and considerable proportion of stroke survivors remained permanently disabled.

• … to new concepts in DIAGNOSIS, MEDICAL THEARPY, and INTERVENTION

   Since acute occlusion of an intracranial artery is responsible for the clinical manifestations, achieving timely recanalization remains the main aim of acute stroke care. Fast arterial recanalization often leads to dramatic clinical recovery.
Hospitals with neurointerventional ability: Needs 3 or more interventionalists

Zaidat et al, Neurology 2012
European cardiologists seek involvement in acute stroke

BY BRUCE JANCIN in European Association of Percutaneous Cardiovascular Interventions Congress on June 17th, 2015

“There should be no fight between the specialties. In hospitals with high patient volume and good work flow and experienced neuroradiologists available 24/7, there is no need for cardiologists to jump in. But in hospitals where that’s not the case then cardiologists can be of help,” he asserted at the annual congress of the European Association of Percutaneous Cardiovascular Interventions.

--Dr. Petr Widimsky
“Structured training programs that focus on the early intervention of stroke could readily provide the cardiologist with the necessary neurological and anatomical knowledge to effectively treat stroke. Such programs, organized and maintained in a cooperative effort by neurointerventionists and cardiologists, would bridge the gap that we will undoubtedly face in the near future.”
What can acute stroke interventionalists learn from cardiologists regarding workflow?

*EuroPCR: 21 May 2015*

1. Petr Widimsky, 2. L. Nelson Hopkins

1. Cardiocenter, University Hospital Kralovske Vinohrady and Third Faculty of Medicine, Charles University Prague, Czech Republic, and 2. Gates Vascular Institute, Department of Neurosurgery, University at Buffalo, United States.

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**Typical STEMI**

- EMS: Pre-hospital ECG
- Cath-lab: intervention
- Cardiology ICU

**Typical acute stroke**

- EMS: clinical suspicion
- Emergency: clinical suspicion
- CT/CT-angio/CT-perfusion
- Neurology: thrombolysis
- Cath-lab: intervention
- Neurology ICU

Fig. 2 shows the optimal workflow in STEMI and acute ischaemic stroke with possible time savings when the emergency room and intensive care unit are skipped en route to the cath lab. Thrombolysis (whenever indicated) should be given in the CT suite and should not delay transfer to the cath lab.
Cardiac Innovation

• Cardiac care has set a high and constantly rising bar for innovation
• Cardiologists and CT-surgeons resourceful in overcoming challenges and quick adopters of new technologies
Why a Vascular Center??

Number One Crippler and Killer in WNY

Heart    Head    Legs

Vascular Disease Specialists Work in Silos

Cardiology    Neurosurgery    Vascular Surgery    Radiology    Engineers    Physicists    Cell biologists
Goal #1: Break Down Silos

Meetings like TCT mix the disciplines, create synergies
Back home, we return to our silos
GOAL Number Two
Change the Treatment Paradigm

Cardiology
Neurosurgery
Vascular Surgery
Radiology
Engineers
Physicists
Cell biologists

Future Vascular Care Delivery…??
Who better to get involved in stroke?

- Cardiologists
  - Understand the emergency of recanalization
  - Skill-set to handle technologies for thrombectomy
  - Work on coronary arteries in a moving target
Poised to fill any shortage
Retrospective/Prospective Economics & Outcomes

- Multidisciplinary approach
- Synergies in Pt care
- Synergies in staffing
  - Cross training
  - Team building
- Economic synergies
  - Flex labs
  - Combo rooms
  - Dual plane labs
How it will work…

- Multidisciplinary stroke teams
  - Endovascular trained neurosurgeons
    - most comfortable with intracranial anatomy/vasculature leading team.
  - Neurologists
  - Cardiologists
  - Radiologists
Pushing the envelope

Innovations in

- Diagnostics
- Devices
- Data
- Delivery
What Does the Evolving Vascular Specialist Look Like…

- Technological advancement will drive the future of vascular neurosurgery practice
- Vascular and endovascular Neurosurgeons need to be equipped with the whole tool box
  - CAS
  - Intracranial Stents
  - Angioplasty techniques
  - Flow Diversion
  - Coil Embolization
  - Coil Sacrifice
  - AVM embolization
  - BTO/WADA testing

http://www.yalemedicalgroup.org/stw/Page.asp?PageID=STW029076
Can we better serve our patients by developing specialized, cross-disciplinary vascular centers of excellence?
Endovascular Neurosurgeons—Evolving Specialty

• “Endovascular Surgical Neuroradiology”
  • Neurosurgery
  • Neurology
  • Neuroradiology
  • Cardiologists???

• Requirement beyond technical training
  • Understand the breadth of natural history, pathophysiology, anatomy, critical care, and diagnostic modalities of vascular diseases
Form enhances function

Close working proximity of:
- multidisciplinary vascular specialists
- Researchers
- Clinical resources