Stroke QUERI
Strategic Plan and Goal Development

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October 12, 2010
Outline

• Background
  – Stroke facts, VA and non-VA

• Current stroke quality improvement activities
  – Joint Commission/Get With the Guidelines
  – VA OQP Stroke Special Project
  – VA Stroke Task Force

• Our process for setting clinical goals
  – Existing work, partner interviews, modeling

• Planned FY11-14 goals and rationale
Audience response question:

• With what organization or group are you most closely affiliated?
  – VA QUERI
  – VA HSR&D
  – VA clinical service
  – VA operations/managerial service
  – VA other
  – Non-VA researcher
  – Non-VA clinician
Stroke Epidemiology in US
AHA Heart and Stroke Facts 2009

• **Incidence:** 795,000 strokes annually
• **Prevalence:** 6.5M stroke survivors
• **Cost:** $69B direct and indirect cost in 2009
• **3rd leading cause of death**
  • CMS 30-day risk standardized mortality:
    • 15.3% in stroke
    • 15.9% in MI
  • Mortality decreased overall 1995-2005 by 30%
• Still a strong marker of 1-year mortality risk:
  • Age 49-69: 14-20%
  • Age ≥70: 24-27%
Stroke Epidemiology in VA

- Stroke incidence and prevalence rates among veterans are unknown
- In FY2007, more than 6000 veterans were admitted to a VAMC for an acute ischemic stroke
  - Does not include patients with TIA (approximately 5,000 diagnosed annually), those admitted with stroke and another acute medical condition, or in-hospital strokes
- In FY07 national VA cohort with ischemic stroke:
  - In-hospital mortality was 4%
  - 6-month mortality was 8%
  - 6-month readmission (VA only) was 27%
- In FY05, the total VA cost of stroke treatment was $315M, with cost per veteran of 3.4x the average VA healthcare cost
Current VA Stroke Performance Measures

• **Stroke-specific measures:**
  • None
  • FIM (functional) screening of inpatients with stroke, amputation, or spinal cord injury transitioned to a “quality indicator without benchmark” in FY08

• **Stroke-relevant measures:**
  • Outpatient:
    • BP, lipids, DM, smoking; none reported in stroke cohort
  • Inpatient:
    • DVT prophylaxis (IPEC measure, stroke not included in high risk group that makes up the denominator)
    • Smoking cessation counseling (not reported for stroke patients specifically)
Stroke Improvement Activities:
Joint Commission Primary Stroke Center Certification

• Collaboration with the American Stroke Association and the Brain Attack Coalition
• Process of data collection and review
  • Registry of patients
  • Staff, including core stroke team, and training
  • 4 months of data on eight core measures
  • Action plans for performance improvement
• One-year certification, then bi-annual review
• More than 600 PSCs as of October 2009
JC Primary Stroke Center Data Elements

- Thrombolytic therapy
- DVT prophylaxis
- Antithrombotic therapy by day 2
- Assessed for rehabilitation
- Stroke education
- Discharge on statin
- Discharged on antithrombotic therapy
- Anticoagulation for atrial fibrillation

Two former measures recently excluded:
- Dysphagia screening before oral intake
- Smoking cessation counseling
Stroke Improvement Activities: AHA/ASA Get With the Guidelines-Stroke

- Hospital-based quality improvement program
- Online data collection and sharing with other program participants
- Harmonized achievement measures with JC PSC plus:
  - Other measures (e.g., dysphagia screening)
  - Other processes (e.g., door to CT time)
  - Other outcomes (e.g., in-hospital mortality)
Current VA Participation in National Stroke QI programs

- JC PSC certified or pending: Bay Pines, Houston, Miami, ? others
- GWTG certified: Bay Pines, ? others
- Other VA facilities have or are pursuing various state certifications
  - Some states are requiring certification for EMS transport of patients with suspected stroke
Stroke Measurement Activities: Centers for Medicare & Medicaid Services (CMS)

- Current proposal for two national facility-level stroke quality indicators:
  - Adjusted 30-day mortality rate
  - Adjusted 30-day readmission rate
- Public comment period recently closed
- Awaiting CMS decision about these 2 measures
Stroke Improvement Activities: OQP/Stroke QUERI Stroke Special Project

• **Background**
  • Stroke is a high volume, high acuity, high impact condition with no current VA performance assessment
  • To improve stroke care across the VA system, we must measure stroke care quality, to identify gaps in care that will serve as targets for future improvement projects

• **Objectives**
  • Assess the quality of inpatient VA stroke care
  • Assess post-stroke risk factor management
  • Feedback data to VAMCs
  • Provide a toolkit of improvement strategies and tools
OQP Stroke Study: Methods

• **Sample**
  • 5000 veterans admitted to a VA facility with discharge diagnosis of ischemic stroke, FY07
  • *Excluded*: hemorrhagic stroke and elective carotid endarterectomy, in-hospital stroke
  • 100% of veterans at small volume centers (≤55 in FY07)
  • 80% of veterans at high volume centers (>55 in FY07)

• **Chart review**
  • Chart review based on electronic medical records only (not paper) by EPRP abstractors
  • VAMCs provided opportunity to review and correct inpatient data
14 Inpatient Processes of Care

**Early Hospitalization**
- Dysphagia screening before oral intake
- NIH Stroke scale completed
- Thrombolysis (tPA) given

**In-Hospital Period**
- Antithrombotic therapy, HD2
- DVT prophylaxis
- Early ambulation
- Fall risk assessment (Morse Scale)
- Pressure ulcer risk assessment (Braden scale)
- Rehab consultation/FIM results

**Hospital Discharge**
- Antithrombotic therapy, D/C
- Lipid management
- Atrial fibrillation management
- Smoking cessation counseling
- Stroke education

- Joint Commission based
- VA-specific

- Among 5000 patients, 3936 were eligible for at least one quality indicator
- Among 131 VAMCs, 129 facilities cared for veterans who were eligible for at least one quality indicator
# Final National In-Patient Data Summary

<table>
<thead>
<tr>
<th>Process of Care</th>
<th>Eligible Patients</th>
<th>Process Present</th>
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</thead>
<tbody>
<tr>
<td>Antithrombotic therapy, DC</td>
<td>3514</td>
<td>96.4</td>
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<tr>
<td>Antithrombotic therapy, HD2</td>
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<td>95.6</td>
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<tr>
<td>Smoking cessation counseling</td>
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<td>94.9</td>
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<td>Pressure ulcer risk assessment</td>
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<tr>
<td>Early ambulation</td>
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<td>Lipid management</td>
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<tr>
<td>DVT prophylaxis</td>
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<td>Anticoagulation for atrial fibrillation</td>
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<td>NIH Stroke Scale documented</td>
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<td>Stroke education</td>
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<td>18.1</td>
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<tr>
<td>Thrombolysis (tPA) given</td>
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<td>8.4</td>
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<td>Process Present %</td>
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Stroke Improvement Activities: VA National Stroke Task Force

• Based on OQP results and ED survey of stroke care, VA assembled a multidisciplinary team to make recommendations about improving acute stroke care
  • ED, Neurology, Primary Care, Nursing, Allied Health, Operations

• Recommendations in four areas:
  • Templates/measures
  • Facility requirements
  • Consent
  • Education
VA Stroke Task Force

Recommendations:

• Each facility will assess and report its capabilities for acute stroke care as:
  • VHA Primary Stroke Center (24/7 acute stroke care)
  • VHA Limited-hours Stroke facility (acute stroke care at some times)
  • VHA Supporting Stroke facility (cannot provide acute stroke care)

• For Primary and Limited Hours Stroke facilities:
  • Stroke clinical pathway/protocol
  • Radiology coverage
  • Stroke team
  • tPA provision for eligible patients
  • Measurement of acute care quality indicators

• All facilities:
  • Treatment or transfer policy
  • Patient and staff education
How do these ongoing activities relate to and inform our clinical goals?

- **Existing work:**
  - Where have we been?

- **Partner interviews:**
  - Where should we be?

- **Systems Dynamics modeling:**
  - If we go there, what will happen?
### Stroke QUERI Existing Work Across the Continuum of Care

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<th>In-hospital Management</th>
<th>Recovery</th>
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</thead>
<tbody>
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<td>Acute Treatment</td>
<td>Hospital Care</td>
<td>Rehab</td>
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- **Stroke Risk Factor Management**
  - Hypertension control
  - Self-management of multiple vascular risk factors
  - Identification of high-risk patients

- **In-hospital Management**
  - Developing systems to document inpatient care processes
  - Implementation of QI interventions aimed at various inpatient processes

- **Recovery**
  - Rehabilitation structure and outcomes
  - Telerehab interventions
  - Depression management

### Cross-cutting projects:
- OQP Stroke Special Project (national quality assessment)
- Systems Dynamics modeling of VHA stroke care
Process for Goal Setting: Partner Interviews

**Purpose:** to solicit opinions from various partners related to how the Stroke QUERI could maximize its efforts to reduce the burden of stroke within VHA

**Process:** drafted series of questions, spoke directly with partners, summarized findings for executive committee

- “Should we focus on multiple risk factor management projects or individual risk factor projects?”
- “Should we focus on low volume/high impact or high volume/low impact indicators?”
- “If we could do one thing to improve VA stroke care, what would you want the Stroke QUERI to do?”

**Partners:** leaders from patient care services (primary care, neurology, rehabilitation, SLP, etc.), HSRD, operations (IPEC), OQP, veteran stroke survivors
Partner Interviews Summary

• **Single vs. multiple vascular risk:**
  - Consensus that HTN is a key stroke risk factor
  - Many entities in VHA are working on HTN so Stroke QUERI should focus on specific targets within HTN
  - Veterans with HTN have multiple vascular risk factors

• **Gaps in clinical areas:**
  - No other national VA groups have major focus on improving thrombolysis, atrial fibrillation management, or carotid stenosis

• **Access to rehabilitation services:**
  - More important than evaluation of specific rehabilitation interventions
  - Many unknowns about provision of rehab post-stroke

• **Measurement:**
  - Consensus on need for improved systematic measurement of key processes and outcomes post-stroke
  - Assumptions about stroke volume not always consistent with data
Veteran stakeholder input

- Conducted 4 focus groups of 17 veteran stroke survivors from two VAMCs (Indy, Houston)
- Presented clinical goals and asked for feedback on importance to veterans
- All groups unanimously chose acute stroke care as the most important priority area
  - Access to tPA
  - Cost concern in going to community hospital first
  - Remaining NPO while waiting for dysphagia screen
- Most felt VA was doing a good job emphasizing prevention in Primary Care
- Most reported being satisfied with the level of rehabilitation services
Process for Goal Setting: Systems Dynamics Modeling

- **Problem**: Many possible interventions exist for improving stroke prevention, acute care and rehabilitation, but it is difficult to compare their relative effectiveness.

- **Approach**: System Dynamics methodology to consider VA system factors, patient factors, and intervention effects to compare various intervention:
  - Model VA care over 5, 10, and 20 year intervals
  - Include degree of intervention implementation, heterogeneous treatment effects, aging population, and trends in health risk behavior
  - Outcomes: disability adjusted life years (DALYs) and stroke-related fatalities

QUERI RRP 09-146, Hayden Bosworth and Kristen Hassmiller-Lich, Durham VAMC
VA Stroke Systems Dynamics Model

**NON-EVENT VA USER POPN**
by age group & subsets of smokers, hypertensives, atrial fib, diabetes, CVD; and interventions targeting particular subsets

**POST-TIA VA USER POPN**
- Undx
- Dx

**OUTCOMES IN VA USER POPN**
- Total strokes & TIAs
- Fatal strokes
- DALYs
- Medical costs

**POST-STROKE VA USER POPN**
- Rankin 0 & 1
- Rankin 2 & 3
- Rankin 4 & 5

**Primary prevention efforts (HTN & AF mgmt)**

**1st Strokes in New VA Users**

**1st TIAs in New VA Users**

**1st TIA**

**1st stroke**

**Survived**

**Fatal**

**Post-TIA CEA & 2° prevention efforts**

**Post-1st stroke Rankin score**

**Post-recurrent stroke change in Rankin**

**TIA diagnosis effort**

**Stroke acute care efforts:**
- Timely to hospital
- Effective tPA use
- DVT prophylaxis
- Dysphagia screening

**Stroke rehab effort**

**Post stroke CEA & 2° prevention efforts**

**Recurrent TIA**

**Recurrent stroke**

**Fatal**

**POST-1st stroke**

**Survived**

**Recurrent stroke**

**Fatal**

**Outcomes in VA User Popn**

- Total strokes & TIAs
- Fatal strokes
- DALYs
- Medical costs
Systems Dynamics Model Outcomes

• Outcomes: Disability-adjusted Life Years (DALYs) and stroke-related deaths
• 20-year base case scenario predicted total of 2.55M DALYs lost and 98,099 stroke-related deaths
• Evaluate relative effect of single interventions or combinations of interventions at 5, 10, and 20-year time horizons
  • Theoretical maximum benefit: 300,000 fewer DALYs lost and 15,201 fewer stroke-related deaths
• CyberSeminar on this modeling work planned for later this year
Planned Goals for 2011-2014

• **Goal 1.** Improve in-hospital management of stroke to reduce stroke mortality and morbidity
  • Stroke decision support systems
  • Active implementation projects

• **Goal 2.** Develop, test, and integrate strategies to improve control of stroke risk factors in veterans at high risk of stroke
  • Uncontrolled hypertension
  • Post-stroke and Transient Ischemic Attack (TIA)

• **Goal 3.** Support VA stroke policy decisions by collecting and reporting VA patient- and system-level data
  • Risk-adjusted mortality tracking
  • Access and systems data
Goal 1. In-Hospital Management

- Improve in-hospital management of stroke to reduce stroke mortality and morbidity
  - **Goal 1A**: Develop systems to document, measure, and improve inpatient stroke care processes and quality
  - **Goal 1B**: Conduct active implementation projects to foster ongoing inpatient stroke quality improvement activities and improve stroke care
In-Hospital Management Activities
Systems to document, measure and improve processes and quality

- **SQUIDSS SDP**: acute stroke decision support and documentation tool that interfaces with CPRS
  - Mock ups and end-user input complete, beta-test in FY11 (Tom Kent, MD; Jane Anderson, PhD)
- **RRP**: testing administratively-derived subacute inpatient quality indicators
  - DVT prophylaxis, Lipid management, Atrial fibrillation management (Neale Chumbler, PhD)
- **Planned work**: SQUIDSS 2.0 SDP, Inpatient administrative QI SDP
  - Implementation in multiple high-volume VAMCs
In-Hospital Management Activities

Active QI projects

• **INSPIRE SDP**: 12-site randomized trial of Systems Redesign-based improvement collaborative vs. data feedback alone
  - Site interviews and baseline data collection ongoing, intervention phase begins FY11
• **REINSPIRE SDP**: pending; rich-context evaluation of local contextual elements and their relationship to improvement in intervention and control sites in INSPIRE (Edward Miech, EdD)
• **Planned RRP**: characterize responses to VA national acute stroke directive
  - Identify and spread successful strategies to address acute stroke treatment needs
In-Hospital Rationale

<table>
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<th>Strength of existing work</th>
<th>Partner interest</th>
<th>Model support (Y/N)</th>
</tr>
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<tbody>
<tr>
<td>Strong</td>
<td>Strong</td>
<td>Y</td>
</tr>
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</table>

**Evidence Summary:**

- GWTG-Stroke programs associated with significant improvement in in-hospital stroke process measures
- Organized inpatient care has similar benefit on improving outcomes as tPA
- Approximately 1/3 of patients arrive in ED at US academic hospitals within 2 hours of symptom onset (stable 2001-2004) but % receiving tPA increased from 14% to 37.5%
- Systems to structure transport to stroke-ready hospitals increase proportion receiving tPA fourfold (9.5% to 23.4%) Toronto pre-hospital project
- Telestroke consultation and radiology can improve access to tPA and can be done safely
Goal 2. Patients at High Risk of Stroke

• Develop, test, and integrate strategies to improve control of stroke risk factors in veterans at high risk of stroke

• **Goal 2A:** Develop and evaluate strategies to improve blood pressure control among veterans with uncontrolled hypertension

• **Goal 2B:** Develop and test approaches to improve risk factor management among veterans post-stroke and TIA
Risk Factor Management Activities

Uncontrolled Hypertension
- HTN Improve (Bosworth)
- Stroke risk Dashboard (Merchant)
- Telephone-based BP intervention (Natarajan)

Post-stroke and TIA
- TOOLS (Damush)
- STOP Stroke (Anderson)
- TIA (Cheng)

- Go To Sleep (Bravata)
- Group visits (Cheng)
- Cross-QUERI Collaborative (Bosworth)
- VA PATRIOTS (Bravata, Zillich)
Veterans with follow-up within 6 months post-stroke

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<tbody>
<tr>
<td>Blood pressure measured</td>
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<tr>
<td>INR measured</td>
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<td>Hemoglobin A1c measured</td>
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<tr>
<td>LDL measured</td>
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<tr>
<td>BP measured and meets goal</td>
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Risk Factor Management Rationale

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<td>Strong (debate on specifics)</td>
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Evidence Summary:
- HTN: highest population attributable risk of any stroke risk factor
- 10mm reduction in blood pressure associated with 30% reduction in stroke risk
- Approximately 80% of veterans with stroke have hypertension
- Despite VA system-wide attention to HTN performance, veterans with stroke commonly have uncontrolled HTN
  - More than half uncontrolled at discharge from VAMC
  - One-third uncontrolled at 6-months post-discharge
- Among 5135 veterans with TIA (FY09), 29% had a recurrent vascular event or died in first 90-days post-TIA
- Rapid TIA management has been associated with large reductions in post-TIA event rates
Goal 3. Support VA Stroke Policy

• Support VA stroke policy decisions by collecting and reporting VA patient-level and system-level data
  • **Goal 3A:** Develop and implement a national VA risk-adjusted stroke mortality tracking and reporting system
  • **Goal 3B:** Develop and evaluate models of stroke care systems to inform VA stroke care organization
Policy Rationale

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Evidence Summary:

- Data are fundamental to informed decision-making
  - Unknowns: VA stroke prevalence, incidence, mortality, patterns of rehabilitation use
  - Emerging data suggest that inpatient rehabilitation is cost-effective compared to short-term nursing home based rehab
- CMS is evaluating risk-adjusted mortality and readmission as facility-level stroke quality indicators
- Organized stroke care improves outcomes
  - VA needs VA-specific patient and system data to support decisions about how stroke care organization should exist in VA
Policy-Relevant Activities
Stroke mortality assessment

• OQP Stroke Special Project
  • FY07 inpatient and outpatient (post-stroke) quality data for 5000 veterans admitted to VA for ischemic stroke
  • Risk-adjustment and quality-mortality analyses ongoing

• Planned project: SDP to develop ischemic stroke identification and risk-adjusted mortality assessment system
Policy-Relevant Activities
Models of stroke care systems

• Systems Dynamics modeling RRP (Kristen Hasmiller-Lich, PhD, Hayden Bosworth, PhD)
• tPA mapping RRP (Glenn Graham, MD, PhD)
  • Veteran access to VAMCs capable of giving tPA
• Rehabilitation structure, cost, and outcomes analysis (Bruce Vogel, PhD)
• Telerehabilitation model to increase access to rehabilitation (Neale Chumbler, PhD)
Other Clinical Goals Considered

• **Emerging Areas of Activity:**
  - Anticoagulation for atrial fibrillation
    • Some projects ongoing in partnership but not a stand-alone focus (Adam Rose, MD; RRP)
  - Carotid stenosis management
    • RRP examining patterns of use in symptomatic patients (Salomeh Keyhani, MD; RRP)
  - Readmission
    • Gathering more data about prevalence and associated factors (Salomeh Keyhani, MD; IIR submission)
Stroke QUERI’s collaborators