

**Department of Veterans Affairs**  
**Quality Enhancement Research Initiative (QUERI)**

**Stroke QUERI Center**

Annual Report and Strategic Plan



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# **Stroke QUERI Center**

## ***2007 Core Strategic Plan***

**November 2006**

## Table of Contents

### CORE STRATEGIC PLAN

	<b>Pages</b>
<b>Strategic Plan Executive Summary</b>	iv
<b>Part I. Center Mission, Goals and Scope</b>	
I.1. Clinical Focus and Scope	1
I.2. Significance and Consequences: Epidemiology, Morbidity/Mortality, Quality of Life and Costs	2
I.3. Treatment/Management and Evidence Base	3
I.4. Current Practices and Quality/Outcome Gaps	6
I.5. Significant Influences on Current Practices and Outcomes	10
I.6. Stroke QUERI Center Goals	15
I.7. Plans for Achieving the Stroke QUERI Center Goals	17
I.8. Addressing Health Disparities	37
<b>Part II. Overview of the Management Plan</b>	
II.1. Overview	38
II.2. Roles of the Stroke QUERI Coordinators	40
II.3. Roles of the Workgroups, Core Teams and Their Leaders	41
<b>References</b>	57

## Table of Contents, continued

	<b>Pages</b>
<b>List of Tables</b>	
Table 1. National VA Program/Entities Influencing Clinical Practices and Outcomes for Stroke	12
Table 2. National Non-VA Program/Entities Influencing Clinical Practices and Outcomes for Stroke	14
Table 3. Stroke QUERI Clinical Goals	16
Table 4. Stroke QUERI Implementation Science Goals	16
Table 5. Projects in the Implementation Pipeline	25
Table 6. Impacts, Contributions and Products	31
Table 7. Stroke QUERI Staff and Executive Committee Roster	46
 <b>List of Figures</b>	
Figure 1. Key Stroke QUERI Collaborations (Wiring Diagram)	11
Figure 2. Continuum of Care Model with Stroke QUERI Workgroups and Selected Projects	19
Figure 3. Conceptual Model Guiding Implementation	21
Figure 4. Stroke QUERI's Implementation Pipeline	24
Figure 5. Stroke QUERI Organization	40
Figure 6. Stroke QUERI Table of Organization	45

# Core Strategic Plan Executive Summary

**The mission of the Stroke Quality Enhancement Research Initiative (QUERI) is to reduce the risk of stroke and to obtain the best possible outcomes for veterans who suffer a stroke. Our ultimate goal is to translate the latest clinical research findings and evidence-based guidelines into routine clinical practice.**

The Stroke QUERI's **overarching focus** is to improve quality of VA stroke care across the continuum from primary prevention to acute treatment and throughout recovery and rehabilitation. This includes engaging and empowering patients and caregivers to participate in self-management of risk factors and stroke recovery. The Stroke QUERI works to support system-wide change and quality by: 1) leveraging existing quality improvement efforts related to stroke risk management, and 2) developing and testing quality indicators for critical elements of stroke care that are not currently measured.

The **scope** of the Stroke QUERI current and planned quality improvement activities across the continuum of clinical care include high priority problems or issues: management of risk factors, promoting guidelines for acute stroke care, screening and management of dysphagia, post stroke depression management and treatment, and patient and caregiver education. Priorities in assessment of stroke care services include evaluation of access to functional assessments, access to rehabilitation care, cost effectiveness of care coordination for hypertension management, and cost effectiveness of different rehabilitation services. A new initiative suggested by our Executive Committee and planned for 2007 is to partner with Office of Quality Performance and the Patient Care Services (Primary Care, Neurology, Physical Medicine and Rehabilitation, Nursing Services, Geriatrics and Extended Care) to evaluate the feasibility of developing a Stroke Scorecard to comprehensively measure the quality of stroke care across the continuum of care. **An immediate goal in this initiative is to develop a quality indicator for screening for post stroke dysphagia, and to develop and execute a rapid pilot implementation project to improve compliance with dysphagia screening.**

The **Stroke QUERI clinical goals** address critical gaps in knowledge and practice, which if addressed could decrease the risk of stroke, improve functional outcomes, and quality of life of stroke survivors. Our clinical goals represent care through the continuum:

- Reduce the risk of stroke
  - Improve management of high blood pressure
  - Appropriate anticoagulation for primary and secondary prevention of stroke for atrial fibrillation

- Reduce complications of stroke
  - Screen stroke patients for dysphagia
- Improve education of patients and caregivers about stroke prevention and stroke recovery
- Improve screening and management of post stroke depression
- Evaluate access to post-stroke rehabilitation services and functional status assessments
- Evaluate cost effectiveness of rehabilitation services and stroke related care coordination programs
- Improve compliance with stroke clinical practice guidelines

The **Stroke QUERI's implementation goals**, based on the three factors of the PARIHS model, addresses the identified gaps in stroke care practices. We are developing implementation tools, actively partnering with front lines providers to modify practices to improve stroke care, and evaluating our implementation efforts.

Evidence:

- Establish the evidence for evidence-based practices for stroke care by synthesizing research evidence, clinical and patient experiences, and stakeholders' preferences
- Increase awareness and understanding of evidence-based practices to VA providers and stakeholders across the continuum of stroke care: the Veterans Affairs/Department of Defense Clinical Practice Guidelines Acute Care; the Management of Adult Stroke Rehabilitation Care; Secondary Prevention

Context:

- Inform implementation science by identifying multi-level contextual factors that influence the adoption and/or maintenance of the stroke clinical guidelines and evidence-based practices across the continuum of stroke care
  - Identify provider and patient level characteristics that affect the implementation of evidence-based practices
  - Identify clinical systems that affect the implementation of evidence-based practices
  - Identify organizational factors that affect the implementation of evidence-based practices
- Inform implementation science on identifying contextual factors that influence the adaptation of existing evidence-based tools into practice

Facilitation:

- Develop and evaluate tools (clinical decision support; performance monitoring) to facilitate the adoption and maintenance of implementing evidence-based practices within the Veterans Health Administration (VHA) organization

- Develop and evaluate direct to consumer strategies to facilitate the implementation of evidence-based practices

Intervention Development/Testing:

- Evaluate the cost-effectiveness of implementing evidence-based practices and interventions
- Develop and evaluate interventions designed to increase the implementation of evidence-based practices across the continuum of stroke care in small pilots and regional multi-site demonstration studies
- Evaluate the ongoing performance of evidence-based practices at the national level
- Evaluate implementation models for implementing evidence-based stroke care across the continuum

**Progress** has been made over the last year in the Stroke QUERI's goal to improve stroke care across the continuum. There has been a progression of work from small pilots, and rapid response projects to larger studies that lead to more specific implementation activities. Examples of these progressions include:

- A pilot project (LIP) evaluating focus groups of caregivers supported the development of a large national caregiver survey and is also contributing to development of culturally sensitive Web-based stroke educational materials.
- A pilot project (LIP) to develop telehealth dialogues for stroke patients contributed to the successful funding of a telehealth trial of stroke rehabilitation. The pilot found that the CCHT (VA Care Coordination/Home Telehealth) can provide a link to the VA for veterans and their caregivers post-discharge.
- A prior implementation planning grant and a National Institute of Neurological Diseases and Stroke funded randomized trial of post-stroke depression supported the successful funding of a project to implement evidence for the detection and treatment of post-stroke depression.
- An Implementation IIR focused on adapting and implementing existing tools for secondary stroke risk factor management was awarded. This project builds on our Process and Outcomes study.

Comparison of our Implementation Pipeline from last year (FY2005) to this year (FY2006) demonstrates transitions of our work from evaluation of clinical practices to more implementation activities.

The Stroke QUERI has also addressed **health disparities** based on our national caregiver survey and partnering with the VA Caribbean Health Care System, Puerto Rico. The

investigators found that culturally appropriate educational materials on care giving and stroke are greatly needed. The Stroke QUERI has selected to address health disparities in Puerto Rican veterans based on its work with the Caribbean Health Care System. Approximately 150,000 veterans are serviced by the San Juan VA Medical Center, and serves the second largest number of stroke patients in the VA (FY 05, N = 2,064). Puerto Rican veterans tend to be less educated, and have more health risk factors, and have limited access to computers and educational materials. A Stroke QUERI funded project, based on work in partnership with the San Juan VA Medical Center and Polytrauma Blast-Related QUERI, aims to pilot test and modify adapted educational materials for OIF/OEF Puerto Rican veterans and their families, to determine the most effective methods to disseminate education materials to them, and to develop implementation methods to provide access to the materials. A second planned project, also based on the national caregiver survey, is being developed to implement tailored, culturally sensitive, useable, and appropriate web-based informational materials for stroke caregivers and health care providers on the My Health<sub>e</sub>Vet (MHV) website.

With direction from the Executive Committee, the Stroke QUERI has reorganized its **administrative structure** to reflect its focus on the continuum of stroke care. The Continuum of Care model (page 19) delineates stroke care into primary prevention, in-hospital care, and recovery/secondary prevention elements. The Stroke QUERI Operations Committee and four Workgroups, 1) Compliance with Stroke Guidelines, 2) Access and Quality of Stroke Care, 3) Risk Factor Management, and 4) Detection and Management of Post-Stroke Depression) use this model to inform discussions on ongoing projects, plan new projects, set Workgroup goals, and plan the next steps in their portfolio and service activities.

Beginning in FY 2006 and continuing in FY 2007 the Stroke QUERI has taken steps to further integrate its Executive Committee and strategically address its scope of clinical and implementation research. This includes:

- Reorganizing and reconstituting the Executive Committee after its first Chair, Dr. Larry Brass, died in early 2006. The new Chair, Dr. David Matchar, is committed to creating strong partnerships within the VA and across Non-VA entities for the QUERI that will facilitate its work in improving stroke care for veterans. In addition, he encourages the active participation of the Committee members with the Stroke QUERI. For instance, Dr. Matchar is a member of the QUERI Operations Committee that meets twice a month. Other Executive Committee members interact with the workgroups, and help in the development and support of research and service activities. For instance, Dr. Robert Ruff is working with Workgroup 2 to formulate ideas for the Stroke Scorecard. Dr. Thomas

Kent, and his nurse research coordinator, Ms. Jane Anderson, are actively engaged with Workgroup 1 and the Implementation Core to develop the SQUIDSS project. To strengthen our implementation strategies we invited Dr. Marita Titler to join the Executive Committee. Dr. Titler is a nationally recognized expert in translating research findings into nursing practice.

- As mentioned above, the Stroke QUERI has been reorganized around the continuum of stroke care model which has helped clarify its mission, priorities, and future direction.
- A Ph.D. level Administrative Coordinator had been added to the Stroke QUERI in order to help the QUERI execute its restructuring around the continuum of stroke care model, and strategically administer the portfolio of clinical and implementation research projects and services activities as a coherent package that addresses the mission and priorities of the Center.
- Continue to strengthen and broaden our partnerships with VA Patient Care Services, Office of Quality and Performance, My HealthVet, and VA managers and clinicians to implement and disseminate best practices for stroke care. We also work in close collaboration with two Centers of Excellence with experience in stroke (Rehabilitation Outcomes Research Center, Gainesville, Florida), and implementation research (Implementation of Evidence Based Practice, Indianapolis, Indiana).

# Part I. Center Mission, Goals and Scope

## I.1 Clinical Focus and Scope

**The mission of the Stroke Quality Enhancement Research Initiative (QUERI) is to reduce the risk of stroke and to obtain the best possible outcomes for veterans who suffer a stroke. Our ultimate goal is to translate the latest clinical research findings and evidence-based guidelines into routine clinical practice.**

One of the challenges of providing comprehensive high quality care to persons with stroke or at risk for stroke is the breadth of the care continuum and the number and variety of care providers that must be successfully engaged. An integrated care system that is excelling at providing quality stroke care would, for example, be performing well in evidence-based outpatient vascular risk factor management (primary prevention), providing guideline-adherent access to thrombolysis (acute treatment), prescribing deep vein thrombosis prevention (in-hospital care), referring appropriate patients to rehabilitation (in-hospital care and recovery), and prescribing evidence-based antiplatelet or anticoagulant treatment (secondary prevention). Such a system would require proactive, collaborative providers from multiple disciplines including primary care, emergency medicine, nursing, neurology, and rehabilitation, interacting with clinical managers that have organized care models and performance assessments throughout the care continuum. In addition, patients and caregivers should be engaged and empowered to participate in self-management of risk factors and stroke recovery.

We recognize that the Stroke QUERI cannot single-handedly support all of the elements necessary to implement this type of system-level change, but our overarching goal is to improve VA stroke care quality by: 1) leveraging existing quality improvement efforts that are related to stroke risk management, and 2) developing and testing quality indicators for critical elements of stroke care that are not currently measured. Our goal and projects are accomplished through partnership with VA Patient Care Services, Office of Quality and Performance, My HealthVet, and VA managers and clinicians to implement and disseminate best practices for stroke care. We also work in close collaboration with two Centers of Excellence with experience in stroke (Rehabilitation Outcomes Research Center, Gainesville, Florida), and implementation research (Implementation of Evidence Based Practice, Indianapolis, Indiana).

The scope of the Stroke QUERI's current and planned quality improvement activities across the continuum of clinical care include high priority problems or issues: management of risk factors, screening and management of dysphagia, post stroke depression management and

treatment, and patient and caregiver education. Priorities in assessment of stroke care services include evaluation of access to functional assessments, access to rehabilitation care, and cost effectiveness of care coordination for hypertension management, and cost effectiveness of different rehabilitation services. A new initiative planned for 2007 is to partner with Office of Quality Performance and the Patient Care Services (Primary Care, Neurology, Physical Medicine and Rehabilitation, Nursing Services, Geriatrics, and Extended Care) to evaluate the feasibility of developing a Stroke Scorecard to comprehensively measure the quality of stroke care across the continuum of care. **An immediate goal in this initiative is to develop a quality indicator for screening for post stroke dysphagia, and to develop and execute a rapid pilot implementation project to improve compliance with dysphagia screening.**

Evidence suggests that the burden of stroke falls disproportionately on minorities, with age-adjusted incidence of first ischemic stroke being 69% greater for Hispanics and 117% greater for African Americans compared to whites. The Stroke QUERI has several activities focused on minority populations. VISN 8 includes the Caribbean Health System which has the largest population of veterans with stroke. QUERI investigator Dr. Maude Rittman has collaborated with the Caribbean Health System to evaluate the trajectory of stroke recovery in the Puerto Rican community. She has held focus groups in Puerto Rico to developed caregiver surveys that are culturally sensitive. Dr. Rittman's work is guiding the development of a new project that plans to implement culturally sensitive and useable Web-based stroke materials for caregivers and health care providers.

## **1.2. Significance and Consequences: Epidemiology, Morbidity/Mortality, Quality of Life and Costs**

Each year in the U.S., about 700,000 people experience a new or recurrent stroke.<sup>1</sup> Approximately 500,000 of these are first strokes, with 200,000 recurrent attacks. In 2003, stroke accounted for about 1 of every 15 deaths in the U.S., ranking stroke third among all causes of death.

Moreover, stroke is a leading cause of serious, long-term disability in the U.S., with over 5.5 million Americans having survived a stroke.<sup>2</sup> Of these, more than 1.1 million American adults report difficulty with functional limitations or activities of daily living as a consequence of stroke.<sup>3</sup> Among stroke survivors, 15-30% are permanently disabled,<sup>2</sup> with 20% requiring institutional care at 3 months after stroke onset.<sup>1</sup>

The estimated direct and indirect cost of stroke in 2006 is \$57.9 billion, consisting of \$37.3 billion (64%) in health care expenditures, \$6.4 billion (11%) in lost productivity due to morbidity,

and \$14.2 billion (25%) in lost productivity due to premature mortality.<sup>1</sup> At the individual level, mean lifetime direct cost of ischemic stroke in the U.S. is \$140,048. Evidence suggests that this burden falls disproportionately on minorities.<sup>1</sup>

Within the VA, approximately 17,000 patients were treated for stroke during fiscal year 2005 (FY05).<sup>4</sup> One year post-stroke mortality for VA inpatients is approximately 20%; and 30% of veterans with stroke are discharged to non-community, institutional settings.<sup>5</sup>

The total VA cost of stroke treatment was almost \$315 million in FY05, with a cost per patient of over \$18,000. ***The importance of stroke within the VA is emphasized by the fact that stroke patients account for over 10 percent of the VA's complex caseload, with a cost per patient that is over 3.4 times the overall VA average.***<sup>4</sup>

In addition to the absolute burden of stroke, many elderly veterans are at high risk of stroke. **Two of the primary stroke risk factors for stroke are common in our veteran population. Hypertension affects more than 8.5 million veterans,<sup>6-8</sup> and approximately 220,000 veterans are diagnosed with atrial fibrillation** (2004 VHA Medical Inpatient datasets, both Acute Inpatient Main and Extended Care Main files, and VHA Medical Outpatient dataset). One year post-stroke mortality for VA inpatients is approximately 20%, with roughly 30% of post-stroke VA inpatients are discharged directly to non-community, institutional settings.

### **I.3 Treatment/Management and Evidence Base**

The mission of the Stroke QUERI is guided by the evidence-based guidelines developed by the Veterans Health Administration and the Department of Defense for management of adult stroke rehabilitation care. These evidenced based guidelines were also endorsed by the American Stroke Association and published in the journal *Stroke*. (Duncan et al. *Stroke* 2005; 36; 100-143).<sup>9</sup> In 2006, this article was the fifth most frequently quoted article published in the journal, *Stroke*.

In addition to the Veterans Administration/Department of Defense (VA/DOD) guideline, the Stroke QUERI's mission as it relates to primary prevention, secondary prevention, and aspects of acute stroke management are guided by evidence summarized in other American Heart Association Guidelines: 1) Prevention of Stroke in Patients with Ischemic Stroke or Transient Ischemic Stroke (Sacco et al. *Stroke* 2006; 37: 577-617)<sup>10</sup>, 2) Early Management of Patients With Ischemic Stroke (Adams et al. *Stroke* 2005; 36: 916-923)<sup>11</sup> and 3) Primary Prevention of Ischemic Stroke (Goldstein et al. *Stroke* 2006; 37:583-1633).<sup>12</sup>

The VA/DOD and other evidence based guidelines for stroke care recognize that individuals with stroke who receive well-organized, multidisciplinary care are more likely to survive their stroke, return home and make a good recovery. The VA/DOD guidelines include evidence base recommendations for early assessment and referral for rehabilitation services, standardized and comprehensive assessment, and treatment of impairments and functional status, prevention of secondary stroke, prevention of post-stroke complications, post-stroke depression management and patient and family education.<sup>9</sup>

Adherence to the VA/DOD post-acute stroke guidelines are associated with improved functional recovery, community discharge, and patient satisfaction.<sup>13-15</sup> Specifically increasing guideline adherence from 50% to 75% could increase Functional Independence Measure (FIM) motor score at rehabilitation discharge by 4 FIM points and increasing adherence by 10 points is associated with a 1.4 odds ratio for being discharged to the community.<sup>16</sup>

A few select examples of the evidence that are guiding the Stroke QUERI scope of work Include:

- Compelling evidence for more than 30 years has demonstrated that the control of high blood pressure contributes to the primary prevention of stroke. Overall, antihypertensive therapy is associated with a 35% to 44% reduction in the incidence of stroke.<sup>17</sup>
- Atrial fibrillation is the most potent common risk factor for stroke. Multiple clinical trials have demonstrated the superior therapeutic effect of warfarin compared with placebo in the prevention of thromboembolic events among patients with nonvalvular AF. Pooled data from 5 primary prevention trials of warfarin versus control have been reported.<sup>18</sup> The efficacy of warfarin has been shown to be consistent across studies, with an overall relative risk (RR) reduction of 68% (95% CI, 50 to 79) and an absolute reduction in annual stroke rate from 4.5% for the control patients to 1.4% in patients assigned to adjusted-dose warfarin. This absolute risk reduction indicates that 31 ischemic strokes will be prevented each year for every 1000 patients treated. The risk reduction for both primary and secondary prevention is similar.<sup>19</sup> Overall, warfarin use has been shown to be relatively safe, with an annual rate of major bleeding of 1.3% for patients on warfarin compared with 1% for patients on placebo or aspirin. The optimal intensity of oral anticoagulation for stroke prevention in patients with AF appears to be International Normalized Ratio, 2.0 to 3.0.
- One of the most dangerous post-stroke complications is aspiration pneumonia caused by dysphagia. Dysphagia, an abnormality in swallowing fluids or food is common, occurring in about 45% of all stroke patients admitted to the hospital. It can seriously

affect the patient's quality of life and potentially lead to death. It is associated with severe stroke and worse outcomes. Malnutrition is also common, being present in about 15% of all patients admitted to the hospital, and increasing to about 30% over the first week. Poor nutritional status is associated with increased risk of infection including pneumonia, gastrointestinal bleeding and pressure sores. There is level-two evidence that supports that a simple valid bedside swallow screening should be completed before initiating oral intake of fluids or foods.<sup>9</sup>

- The prevalence of post-stroke depression identified through VHA inpatient/outpatient databases estimated that between 40% to 57% of individuals post-stroke have depression. It is associated with worse functional outcomes, lowered quality of life and increased post-stroke mortality. Our prior work has demonstrated that these effects are present in veterans with stroke and we found that those with a new depression diagnosis post-stroke had a 25% increase in mortality and health care utilization post-stroke.<sup>20, 21</sup> Several small clinical trials have suggested that treatment with an antidepressant can improve depression symptoms in patients with post-stroke depression, and we recently completed a five-year randomized trial of depression care management demonstrating that guideline-adherent depression care resulted in significantly more depression remission than usual care after stroke (manuscript in press).<sup>22</sup>
- Patients who receive organized inpatient multidisciplinary stroke care are more likely to survive their stroke, return home and make a good recovery. A systematic review of 9 trials revealed that organized and multidisciplinary rehabilitation was associated with a reduced odds of death (OR .66; 95% CI, .49 to .88), death or institutionalization (Odds Ratio (OR) = .70; 95% CI, .56 to .88) and death or dependency (OR=.65; 96% CI, .50 to .85).<sup>23</sup>
- Three systematic reviews, and 7 clinical trials, have demonstrated educational interventions have been successful in improving the patient and caregiver's knowledge about stroke and may assist patients and caregivers in making effective decisions about treatments.<sup>9</sup>

#### **I.4. Current Practices and Quality/Outcome Gaps**

The Stroke QUERI, our research partners, and other VA researchers have documented significant evidence-practice gaps in stroke risk factor management and stroke care quality. We have organized four workgroups around these key gaps and have projects either underway or planned to address high priority issues.

**Management of Hypertension:** In the VA, there is substantial variability in blood pressure control. Several VA studies have documented that only 25% - 40% of hypertensive patients had their blood pressure under control (< 140/90 mm/Hg).<sup>7, 24-26</sup> Data from our recently completed locally initiated project demonstrated that in VISN 11 only 26% of veterans with stroke met the established VA performance criteria for hypertension management of having at least 75% of blood pressure measurements at or below goal (L. Williams, Locally Initiated Project, 2006).

**Anticoagulation for Atrial Fibrillation:** Utilizing VA administrative databases, our investigators sought to determine the impact of warfarin for secondary prevention of mortality and morbidity among stroke patients with atrial fibrillation (AF). In a recently completed retrospective observational cohort (FY01) study of individuals with stroke and atrial fibrillation, we found that 39.8% of these individuals had received outpatient warfarin therapy within 4 weeks of the stroke admission date. Controlling for age and co-morbidities, we found that warfarin is associated with significantly improved survival over a 2 year period following stroke (Hazard Ratio: 0.568, 95% CI: 0.445-0.724) [Manuscript submitted to Annals of Internal Medicine]. Utilizing FY03 data from the Decision Support System lab data, our investigators determined that individuals with stroke and AF, who are anticoagulated, are in a therapeutic range (International Normalized Ratio, 2-3) approximately 50% of the time.

**Dysphagia:** A recent report by the Office of the Inspector General (OIG)<sup>27</sup> evaluated the management of patients with feeding and swallowing problems in VHA medical facilities and found significant variations in care and opportunities for improvement of dysphagia evaluation and management. Even though this OIG report was not restricted to stroke, the findings are important because dysphagia is common after stroke. A recent review of swallowing evaluations at the NF/SGVHS Gainesville and Lake City medical facilities demonstrated that only 43 out of 188 veterans (23%) admitted for stroke or TIA received a documented swallowing evaluation during the past six months.

**Post-Stroke Depression (PSD) Management:** Considerable variation has been documented in non-stroke-related depression screening and follow-up in the VA (MH QUERI 2005 Strategic Plan). Although annual screening rates are high, follow-up within six weeks of a

positive screen (a recommended performance measure) occurs much less often. A study in 14 VHA hospitals in the Northeast demonstrated that although adequate antidepressant dosage was achieved in 90% of patients with a major depression diagnosis only 45% had adequate duration of treatment, with younger age, African American veterans, and treatment exclusively in primary care associated with inadequate depression care.<sup>28</sup>

Gaps also exist and are likely magnified specifically in the detection and treatment of PSD. Studies done as pilots in the Stroke QUERI have shown:

- Depression was diagnosed in only 27% of veterans in the first three year after stroke, even when outpatient diagnoses and written physician notes were examined.<sup>29</sup>
- PSD is under-treated, with 20% of patients prescribed an antidepressant after stroke receiving only a single prescription.<sup>30</sup>
- Only 1/3 of veterans with recent stroke are screened for depression in primary care during the six months immediately post-stroke. This “accidental” screening occurs only if the annual depression performance measure was due at that visit and is not targeted specifically to this high-risk group of veterans (data from the VISN Implementation Planning Grant – L. Williams 2004).

**Access to Rehabilitation Services:** In collaboration with Physical Medicine and Rehabilitation Service, Stroke QUERI investigators used the Integrated Stroke Outcomes Data Base (FY2003), to analyze access to inpatient and outpatient rehabilitation care for individuals with moderate stroke (Functional Related Groups 4-7). Our results demonstrated that access to intensive rehabilitation bed unit care varied across VISNs from 9% to 60%. In a subsequent collaboration with Whitson et al.<sup>31</sup> we determined that the individuals with intermediate functional impairment (FRG 4-7) are at the highest risk for subsequent fracture. However it is not known yet if access to rehabilitation services would decrease the fracture risk.

**Patient and Family Education:** Compliance with the post acute stroke guidelines for patient and family education is only 36%.<sup>16</sup> The gaps in the provision of patient and family education are not unique to the VA. Non-VA studies have demonstrated stroke survivors and their caregivers often do not have the information necessary to manage the recovery process,<sup>32</sup> caregivers are dissatisfied with information provided to them about stroke and lack basic knowledge about stroke and prevention of future stroke.<sup>34</sup> The information they do receive is often not tailored to individual patient needs, creating a gap in meeting the needs of this group.<sup>35</sup> Further, health care providers do not have easy access to current patient education materials for stroke survivors and their families.

**Uptake of the VA/DOD Guidelines:** In spite of the Employee Education System's efforts to develop and disseminate knowledge about the VA/DOD guidelines, there has been very minimal uptake of the educational programs. For example, over the last 3 years only 123 physical therapists, occupational therapists, and speech and language pathologists have accessed the EES education module.

**Management of Quality and Outcome Gaps in Non-VA Settings:** Several important national initiatives have resulted in the development of tools to both enhance and evaluate the quality of stroke care. The initiatives come from one of the VA Stroke QUERI's strategic stakeholders, the American Stroke Association (ASA). An ASA task force recently published recommendations for the establishment of stroke systems of care<sup>37</sup> and describes 3 critical functions of a stroke system. A stroke system should: 1) ensure effective interaction and collaboration among all providers of stroke patients; 2) promote use of a standardized approach in each facility; and 3) identify performance measures (both process and outcomes measures) and include a mechanism for evaluating effectiveness through the system.<sup>37</sup> Based on these and other recommendations, the ASA<sup>38</sup> and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) have established assessment and credentialing for primary stroke center status (JCAHO manual reference). This credentialing evaluates key structure and process elements and includes the implementation of quality improvement systems as a necessary component for primary stroke center status.<sup>38</sup> There are currently 334 JCAHO certified stroke centers. There are no VA facilities certified for stroke care.

The ASA also developed a hospital-based quality improvement program for cardiac and stroke patients, "Get With The Guidelines" (GWTG)<sup>36</sup>. This program, which received the 2004 Innovation in Prevention Award, includes tools to evaluate the quality of acute stroke treatment delivery, initiate stroke guideline recommended therapies, and deliver patient education at the teachable moment immediately after an acute stroke event. As of October 6, 2006, there are 847 facilities with GWTG signed contracts, of which 334 are JCAHO Primary Care Stroke Centers. This means that almost every Primary Stroke Center is a GWTG hospital (AHA/ASA Stroke Activity Report). The GWTG program requires the transmission of data from the VA to a civilian, commercial data depot for benchmarking. Due to the transfer of data, several VA hospitals have been unsuccessful in attempting to implement GWTG.

Stroke quality indicators are being developed by JCAHO and a consortium including NCQA, the American Medical Association (AMA), and the AMA-convened Physician Consortium for Performance Improvement<sup>TM</sup>, and the Center for Medicare and Medicaid for proposed consideration in the CMS voluntary reporting system. The candidate measures include:

- DVT Prophylaxis
- Discharged on Antithrombotics
- Patients with Atrial Fibrillation Receiving Anticoagulation Therapy
- Tissue Plasminogen Activator (t-PA) Considered
- Antithrombotic Medication within 8 Hours of Hospitalization
- Lipid Profile
- Screen for Dysphagia
- Stroke Education
- Smoking Cessation
- A Plan for Rehabilitation was Considered

The present timeframe for completion of this project is January 1, 2007. JCAHO anticipates roll-out of a standardized measure set for certification purposes on July 1, 2007

The VA does not have any stroke specific performance measures. Yet there are several EPRP relevant performance measures (e.g.: LDL in goal, Hgb A1c in goal, blood pressure in goal, smoking cessation and screening for depression) in use. The Office of Quality Performance has one stroke specific performance indicator for rehabilitation. This performance indicator requires that all stroke, TBI and amputee patients have a functional status assessment (Functional Independence Measure). This indicator was established in 2002 and since then the compliance with FIM assessment for stroke has improved from 65% in FY03 to 87.6% in FY06.

Consistent with the JCAHO initiatives, and the evidence that establishment of a performance measure for rehabilitation significantly improved compliance, the VA needs to establish evidence-based performance measurement for stroke care. To respond to this need, the Stroke QUERI has set as a new goal to work with the Office of Quality and Performance to assess the feasibility of developing a scorecard to assess the quality of stroke care. Several performance measures relevant to quality of primary and secondary stroke prevention already are in use in the VA (e.g. hypertension control, diabetes control, consideration of rehabilitation for all veterans admitted with stroke). We envision initially using the existing stroke-related performance measures as a base of measurement for the scorecard, then strategically directing our efforts toward developing and testing high-priority additional indicators. For example, an immediate priority is to work with OQP to develop a quality indicator for dysphagia screening post-stroke. We are also planning a Service Directed Project (Development and Feasibility Test of Implementing SQUIDDS: A Stroke Quality Improvement Decision Support System) to develop clinical reminders and documentation templates prompting guideline-adherent acute stroke care.

## **I.5. Significant Influences on Current Practices and Outcomes**

**VA Influences on Practices and Outcomes:** The Stroke QUERI focuses its efforts on assessing compliance with VA clinical practice guidelines for stroke, and developing and implementing innovative approaches to improve stroke care. To accomplish these goals, the Stroke QUERI continued, in 2006, engaging with its key clinical stakeholders: Physical Medicine and Rehabilitation Services, Neurology Service, Office of Care Coordination in VISN 8, Quality Management Officers, and veterans with stroke and their caregivers. We collaborated with Dr. Mary Goldstein and the ATHENA developers in VA Palo Alto, the Houston VAMC (second largest stroke service in the VA), and the Caribbean Health System. In 2006, we began collaboration with the VA National Center for Health Promotion and Disease Prevention (NCP), a field-based program office of the VA Office of Patient Care Services. They featured the Stroke QUERI's "Sarge" stroke prevention direct to consumer campaign on its website and included a link to the Stroke QUERI website. We are also collaborating with My HealthVet to develop a Service Directed Project (SDP) to implement culturally sensitive, usable and appropriate Web-based materials for stroke caregivers and health care providers. Finally, Nan Musson from our QUERI is working with the National Task Force for Dysphagia Management to identify appropriate strategies for implementing the directives for screening for dysphagia in individuals with stroke. In 2007, we will work with the OQP, the National Task Force for Swallowing Management, Physical Medicine and Rehabilitation, Nursing Services, and the Audiology and Speech and Language Services to develop a quality indicator for screening of swallowing post stroke.

In 2006, we expanded our collaborations with leading researchers and opinion leaders, Dr. Eugene Oddone and Dr. Hayden Bosworth, both from the Durham VAMC, Center of Excellence. They have also joined our Executive Committee and the Workgroup 3 Research Objective of Stroke Risk Management. The Stroke QUERI strengthened its relationships across QUERI Centers and partnered with the Diabetes QUERI through Dr. Sarah Krein's participation on our Executive Committee, the Mental Health QUERI through collaboration with IRC, Jeff Smith on our Post Stroke Depression implementation project, and the Polytrauma and Blast Related Injury QUERI through investigator, Diane Cowper, Ph.D., IIR funding from HSR&D on a GIS mapping study of OIF/OEF veterans with traumatic injury.

The Stroke QUERI continues to collaborate with VA entities that support and promote the implementation of evidence-based practices informing clinical policy and through guideline development dissemination, and performance measures. Our collaborations include the Office of Quality and Performance, the VA/DOD Evidence Based Practice Work Group and the Employee Education System.



**Table 1. National VA Programs/Entities Influencing Clinical Practices and Outcomes for Stroke**

VA Programs/Entities	Descriptions
VISNs	<ul style="list-style-type: none"> <li>• 8 - VA Sunshine Healthcare Network</li> <li>• 11 - Veterans In Partnership</li> <li>• 15 - VA Heartland Network</li> <li>• 17 - VA Heart of Texas Health Care Network</li> </ul>
Facilities	<ul style="list-style-type: none"> <li>• Richard L. Roudebush VA Medical Center, Indianapolis, IN</li> <li>• Michael E. DeBakey VA Medical Center, Houston, TX</li> <li>• VA Caribbean Health Care System, San Juan, PR.</li> <li>• Malcom Randall VA Medical Center, Gainesville, FL</li> <li>• Kansa City VA Medical Center, Kansa City, MO</li> <li>• Durham VA Medical Center, Durham, NC</li> <li>• Minneapolis VA medical Center, Minneapolis, MN</li> <li>• Atlanta VA Medical Center, Decatur, GA</li> <li>• James A. Haley VA Medical Center, Tampa, FL</li> <li>• VA Community Based Outpatient Clinics in VISN 8 and 11</li> </ul>
Patient Care Services	<ul style="list-style-type: none"> <li>• Neurology</li> <li>• Physical Medicine and Rehabilitation</li> <li>• Primary Care</li> <li>• Nursing</li> <li>• Extended Care</li> <li>• Auditory, Speech and Language</li> <li>• Emergency Care</li> </ul>
Office of Quality Performance (OQP)	Through its work in clinical guideline development, performance measurement, accreditation and credentialing, OQP plays a major role in influencing quality improvement in VHA treatment settings.
Office of Care Coordination (OCC)	OCC role is to act as the national program office to support VA's national implementation of care coordination, coordinate clinical input into VA's patient-held records My Health@Vet, coordinate clinical input into e-health information to veteran patients, incorporates VA's telehealth/telemedicine initiatives, and supports VA's Social Work Service.
VA National Center for Health Promotion and Disease Prevention (NCP)	The VA NCP is a field-based program office of the <a href="#">VHA Office of Patient Care Services</a> and a resource to a broad range of customers from healthcare policy makers to front-line providers of services to veterans and beyond.
VA My Health@Vet	My Health@Vet provides access to trusted health information, links to Federal and VA benefits and resources, the Personal Health Journal, and online VA prescription refill. Thus, My Health@Vet is a powerful tool to help veterans better understand and manage their health.
MOVE!	<i>MOVE!</i> is a national weight management program designed by the <a href="#">VA National Center for Health Promotion and Disease Prevention (NCP)</a> , a part of <a href="#">the Office of Patient Care Services</a> , to help veterans lose weight, keep it off and improve their health.
VA DoD Evidence Based Practice Work Group	The Group prioritizes clinical areas for which CPGs need to be developed, adapted and/or adopted; oversees and participates in CPG development and/or adaptation; assures revision of existing CPGs; and facilitates implementation of CPGs.

VA Programs/Entities	Descriptions
Office of Patient Education	The Office of Patient Education provides health & wellness information to veteran patients, their family members, and staff. Patient Education offers services such as Patient Education/Patient Health Libraries and <a href="#">Patient Health Classes</a> .
VA Employee Education System (EES)	The EES is the VA's education and training organization for employees. By offering multiple opportunities and forums for learning about evidence-based care and quality improvement, EES serves as an important resource for influencing clinical practice.
VA Information Resource Center (VIReC)	VIReC is a VA HSR&D Service Resource Center. Its mission is to improve the quality of VA research that uses databases and information systems. VIReC provides an infrastructure of database and informatics experts, customer service, expert advice, information products, and Web technology to VA researchers and others.
VA Pharmacy Benefits Management Strategic Health Group	The purpose of the VA Pharmacy Benefits Management strategic health group is to improve the health status of veterans by encouraging the appropriate use of medications in a comprehensive medical care setting. The pharmacy benefits management database captures extensive prescription information for all VA patients who obtain their prescriptions within the VA system.
HSR&D and RR&D Rehabilitation Outcomes Research Center (RORC)	The RORC develops and integrates clinical and administrative data to evaluate outcomes of post-acute stroke care, advances outcome measurement in stroke, evaluates clinically significant outcomes emerging therapies for stroke rehabilitation, and provides some of the infrastructure to support the Stroke QUERI.
HSR&D Center of Excellence on Implementing Evidence-Based Practice	The Center of Excellence on Implementing Evidence-Based Practice, generates new knowledge about best practices through clinical and organizational research; Identify organizational, environmental and provider-based aspects of health systems that influence adoption of these best practices; Design and test health system interventions to support, expand, and sustain the implementation of evidence-based practice; Make maximal use of research evidence in routine care; and Facilitate the use of research in the dissemination of best practices.

**Non-VHA Influences Practice and Outcomes.** Important non-VA sources of influence on clinical practices include the American Stroke Association, the ASA/JCAHO task force to develop quality indicators for stroke care, the Paul Coverdale Stroke Registry, the Canadian Stroke Network, and the Ontario Stroke Initiative, and the Duke DEcIDE Center.

Stroke QUERI investigators are closely linked to all of these initiatives and are often the leaders or serve on their advisory boards. For instance, Dr. Pamela Duncan is Vice-Chair of the ASA Leadership, a member of the ASA/JCAHO task force, and a member of the executive advisory panel of the Canadian Stroke Network; Dr. Linda Williams is a member of the AMA/NCQA stroke guidelines writing panel and leads the ASA panel developing performance measures for Comprehensive Stroke Centers; Dr. David Matchar, the Stroke QUERI Executive Committee Chair, is director of the Duke DEcIDE Center; and Dr. Larry Goldstein, a Stroke QUERI investigator, helped develop the Paul Coverdale Stroke Registry.

**Table 2. National Non-VA Programs/Entities Influencing Clinical Practices and Outcomes for Stroke**

Non-VA Programs/Entities	Descriptions
American Stroke Association	The American Stroke Association offers a wide array of programs, products and services, from patient education materials to scientific statements in purpose to reduce stroke and stroke risk.
Canadian Stroke Network	The Canadian Stroke Network's mission is to reduce the impact of stroke on Canadians through collaborations that create valuable new knowledge in stroke; to ensure the best knowledge is applied; and to build Canadian capacity in stroke.
Florida Center for Medicaid and the Uninsured	The mission of the Florida Center for Medicaid and the Uninsured is to conduct research and policy analysis on issues related to access to health care for low-income individuals and their families.
Florida's Agency for Health Care Administration (AHCA)	AHCA is responsible for administering the state's Medicaid program, as well as regulating nearly 19,000 health care facilities and 25 health maintenance organizations operating in Florida.
Stroke Initiatives in Ontario	Stroke Initiatives in Ontario is Ontario government stroke strategy to ensure Ontarians have increased access to stroke prevention and care. Rehabilitation Pilot Projects, Secondary Stroke Prevention Clinics, Telestroke Pilots, Education and Training are some of the stroke strategy initiatives underway to help ensure stroke patients have access to quality care, prevention, treatment and recovery.
National Stroke Association (NSA)	The NSA is a nonprofit organization dedicated to educating stroke survivors, families, health care professionals, and the general public about stroke. It seeks to reduce the incidence and impact of stroke through activities related to prevention, medical care, research, rehabilitation, and re-socialization.
Research Data Assistant Center (ResDAC)	ResDAC is a <a href="#">Centers for Medicare &amp; Medicaid Services</a> contractor that provides free assistance to academic, government and non-profit researchers interested in using Medicare and/or Medicaid data research.
Paul Coverdell National Acute Stroke Registry	Paul Coverdell National Acute Stroke Registry is Centers for Disease control and Prevention that implement state-based registries that measure, track, and improve the delivery and quality of stroke care.
Centers for Medicare and Medicaid Service (CMS)	CMS offers researchers and other health care professionals a broad range of quantitative information on their programs, from estimates of future Medicare and Medicaid spending to enrollment, spending, and claims data.
Florida Medicaid	Medicaid is the state and federal partnership that provides health coverage for selected categories of people with low incomes. Its purpose is to improve the health of people who might otherwise go without medical care for themselves and their children.
Duke Developing Evidence to Inform Decisions about Effectiveness (DEcIDE) Network	The DEcIDE Network is a new network of research centers that Agency for Healthcare Research and Quality created in 2005 to generate new knowledge. The DEcIDE Network conducts accelerated practical studies about the outcomes, comparative clinical effectiveness, safety, and appropriateness of health care items and services.

## **I.6. Stroke QUERI Center Goals**

**The overall mission of the Stroke QUERI is to reduce the risk of stroke and to obtain the best possible outcomes for veterans who suffer a stroke.** We have targeted high priority clinical problems or issues concerning clinical care. The priority clinical areas include management of risk factors, screening and management of dysphagia, post stroke depression management and treatment, and patient and caregiver education. Priorities in assessment of stroke care services include evaluation of access to functional assessments, access to rehabilitation care, and cost effectiveness of care coordination for hypertension management, and cost effectiveness of different rehabilitation services. A new initiative planned for 2007 is to partner with Office of Quality Performance and the Patient Care Services (Primary Care, Neurology, Physical Medicine and Rehabilitation, and Geriatrics and Extended Care) to evaluate the feasibility of developing a Stroke Scorecard across the continuum of care. This planned integrated exercise is to an attempt to assemble the existing stroke relevant EPRP (External Peer Review Process) measures already being collected by OQP into a preliminary Stroke Scorecard.

The clinical goals of the Stroke QUERI are ambitious. Each goal of the Stroke QUERI is important. However, the management of stroke is complex and involves numerous health care providers, different systems of care (primary care, acute care, post-acute rehabilitation, and extended care) and management thru the continuum (primary prevention, in-hospital management, secondary prevention and recovery). We accomplish our goals by providing guidance to QUERI investigators, and through close collaboration with other VA researchers, the Rehabilitation Outcomes Research Center and Implementation of Evidence-Based Practice, to address these goals. Our extensive networks and collaborations with non-VA initiatives also offer opportunities for leveraging activities to accomplish our VA specific goals. We have a virtual community of VA and Non-VA researchers, clinicians, and managers who work to improve stroke care.

**Stroke QUERI Clinical Goals.** The Stroke QUERI's clinical goals address critical gaps in knowledge and practice, which if closed could decrease the risk for stroke, improve functional outcomes, and quality of life of stroke survivors. In collaboration with our executive committee we have assured that our clinical goals represent care thru the continuum.

**Table 3. Stroke QUERI Clinical Goals**

<b>Goal 1</b>	Reduce the risk of stroke <ul style="list-style-type: none"> <li>o Improve management of high blood pressure</li> <li>o Appropriate anticoagulation for primary and secondary prevention of stroke for atrial fibrillation</li> </ul>
<b>Goal 2</b>	Reduce complications of stroke <ul style="list-style-type: none"> <li>o Screen stroke patients for dysphagia</li> </ul>
<b>Goal 3</b>	Improve education of patients and caregivers about stroke prevention and stroke recovery
<b>Goal 4</b>	Improve screening and management of post stroke depression
<b>Goal 5</b>	Evaluate access to post-stroke rehabilitation services and functional status assessments
<b>Goal 6</b>	Evaluate cost effectiveness of rehabilitation services and stroke related care coordination programs
<b>Goal 7</b>	Improve compliance with stroke clinical practice guidelines.

**Stroke QUERI Implementation Science Goals.** The Stroke QUERI's implementation goals address the identified gaps in practices from our previous work and the factors contributing to those gaps. We are developing implementation tools, adapting existing tools for the VA, and actively collaborating with front line providers to improve stroke care, and evaluating ongoing stroke related projects and care. In 2006, we began active implementation with front-line providers. Dr. Williams and Dr. Beyth lead monthly meetings with front-line providers of stroke care in the VA to collaborate on modifying the existing VA depression screener for stroke patients (see Workgroup 4). In 2007, we will again collaborate with front-line providers as we tailor stroke secondary prevention at the local level based on resources and provider preferences. The Stroke QUERI goals are listed within the three factor framework of implementation depicted in the PARIHS model.

**Table 4. Stroke QUERI Implementation Science Goals**

<b>EVIDENCE</b>	
<b>Goal 1</b>	Establish the evidence for evidence-based practices for stroke care by synthesizing research evidence, clinical and patient experiences, and stakeholders' preferences.
<b>Goal 2</b>	Increase awareness and understanding of evidence-based practices to VA providers and stakeholders across the continuum of stroke care: the Veterans Affairs/Department of Defense Clinical Practice Guidelines Acute Care; the Management of Adult Stroke Rehabilitation Care; Secondary Prevention

<b>CONTEXT</b>	
<b>Goal 3</b>	Inform implementation science by identifying multi-level contextual factors that influence the adoption and/or maintenance of the stroke clinical guidelines and evidence-based practices across the continuum of stroke care.
Goal 3a	<ul style="list-style-type: none"> <li>○ Identify provider and patient level characteristics that affect the implementation of evidence-based practices;</li> </ul>
Goal 3b	<ul style="list-style-type: none"> <li>○ Identify clinical systems that affect the implementation of evidence-based practices;</li> </ul>
Goal 3c	<ul style="list-style-type: none"> <li>○ Identify organizational factors that affect the implementation of evidence-based practices.</li> </ul>
<b>Goal 4</b>	Inform implementation science on identifying contextual factors that influence the adaptation of existing evidence-based tools into practice.
<b>FACILITATION</b>	
<b>Goal 5</b>	Develop and evaluate tools (clinical decision support; performance monitoring) to facilitate the adoption and maintenance of implementing evidence-based practices within the VHA organization
<b>Goal 6</b>	Develop and evaluate direct to consumer strategies to facilitate the implementation of evidence-based practices
<b>INTERVENTION DEVELOPMENT/TESTING</b>	
<b>Goal 7</b>	Evaluate the cost-effectiveness of implementing evidence-based practices and interventions.
<b>Goal 8</b>	Develop and evaluate interventions designed to increase the implementation of evidence-based practices across the continuum of stroke care in small pilots and regional multi-site demonstration studies.
<b>Goal 9</b>	Evaluate the ongoing performance of evidence-based practices at the national level.
<b>Goal 10</b>	Evaluate implementation models for implementing evidence-based stroke care across the continuum

### **I.7. Plans for Achieving the Stroke QUERI Center Goals**

The scope of the QUERI work is developed and executed by four workgroups and supported by three cores groups. The four Workgroups are:

- Work Group 1 - Compliance with Stroke Guidelines
- Work Group 2 - Access and Quality of Stroke Care
- Work Group 3 - Risk Factor Management
- Work Group 4 - Detection and Management of Post-Stroke Depression

Each workgroup is responsible for developing a portfolio of funded projects and establishing collaborations consistent with our stated goals and representative of projects across the pipeline. The workgroups have been very successful in developing pilot projects, and formative evaluations that have supported future implementation projects. For example, Dr. Neale Chumbler had a pilot project to develop dialogues for stroke management. This work is supported, in part, by his successful funding of a trial for home-based tele-rehabilitation. Dr. Maude Rittman had a rapid response project that supported her development of a national caregiver survey, and

finally Dr. Linda Williams had an implementation planning grant that supported her Post-Stroke Depression Implementation project.

The supporting cores are:

- Implementation Core
- Methodology Core
- Dissemination Core

The workgroups and cores' activities are further described in the Management Plan.

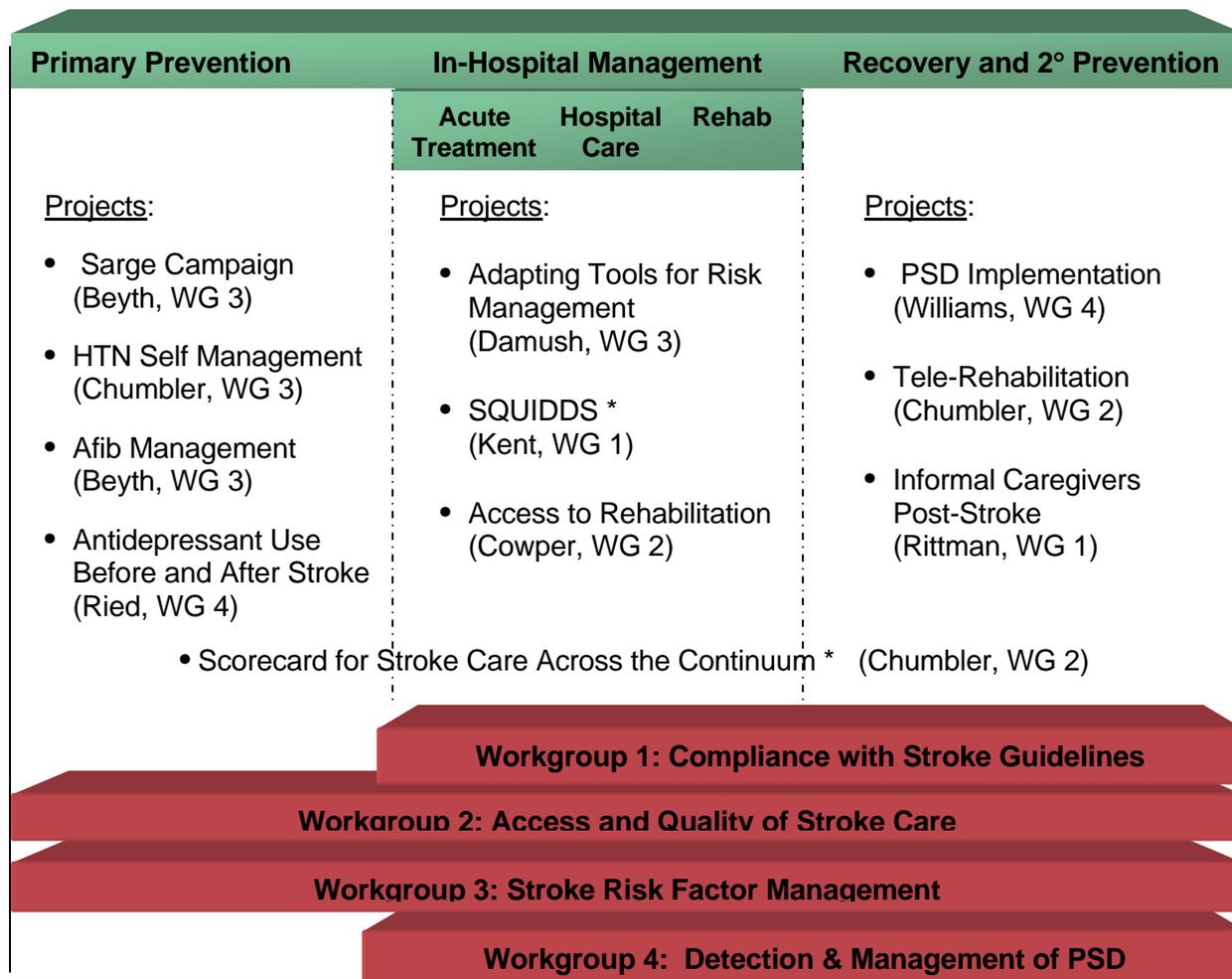
### **Conceptual Model for Clinical Management of Stroke.**

The scope of work developed by the workgroups and cores are driven by a clinical model and an implementation model.

Quality stroke care encompasses a wide range of care systems, settings, and providers. The Stroke QUERI, with the encouragement of our Executive Committee, has adopted a clinical Continuum of Care model to guide each workgroup's planned projects and the overall Stroke QUERI portfolio. Although we recognize that it is beyond the scope of the QUERI to address all stroke care elements across this continuum, we use this model to strategically allocate time and resources to projects and as a platform for outlining important next steps for stroke implementation research.

The Continuum of Care model delineates stroke care into primary prevention, in-hospital care, and recovery/secondary prevention elements. This model is informed by the work of other key VA groups, especially in the area of primary prevention where much critical work in management of stroke risk factors is ongoing in the Coronary Artery Disease QUERI, the Diabetes QUERI, and various groups focusing their research on hypertension management in VHA. Drawing on this body of work, each Stroke QUERI Workgroup uses this model to inform discussions about ongoing projects, to set workgroup goals, and to plan next steps in their portfolio. In so doing, each workgroup ensures that they consider how they can best direct their efforts to improve the quality of stroke care in their specific focus area across the continuum of stroke care.

**Figure 2. Continuum of Care Model with Stroke QUERI Workgroups and Selected Projects**



\* Pending project

The Continuum of Care figure illustrates some of our specific ongoing or planned projects in each care element and demonstrates how this model permeates our workgroups and our overall portfolio of research. Additional information about each of these and other projects can be found in Table 8 and Table 9 of the Annual Report. The projects are examples of how the Stroke QUERI portfolio is engaging in work to improve the quality of VA stroke care across the clinical continuum. For example, in response to feedback on our FY 2005 annual report, we directed efforts to **primary prevention projects** such as:

- A pilot campaign using direct-to-consumer marketing strategies to increase awareness of stroke risk factors and how to manage them among veterans at risk for stroke (“Sarge campaign”)

- A project to demonstrate cost effectiveness of blood pressure self management via tele-health technology specifically to reduce stroke risk and are addressing the issue of anticoagulation in atrial fibrillation via implementation strategies to support patient and provider decision making
- Examined the use of antidepressants before and after stroke to evaluate the effectiveness of treatment in prevention of post-stroke depression in anticipation of an active implementation project

In the element of **in-hospital management**, projects have included:

- Adapting existing stroke guidelines for risk factor management post-stroke to VA inpatient and post-discharge care (Adapting Tool project)
- Focusing on response to identified stroke risk factors at the time of stroke and patient behavioral change to improve risk factor management (Tools project)
- Planning a service-directed project to develop and pilot test the implementation of a stroke decision support system consisting of documentation templates and reminders to guide providers to key guideline-adherent care processes (e.g. appropriate consideration of thrombolysis, use of deep venous thrombosis prevention measures and swallowing evaluation, use of appropriate antiplatelet therapy) at the time of acute stroke evaluation and admission (the SQUIDSS project, resubmission December 2006)

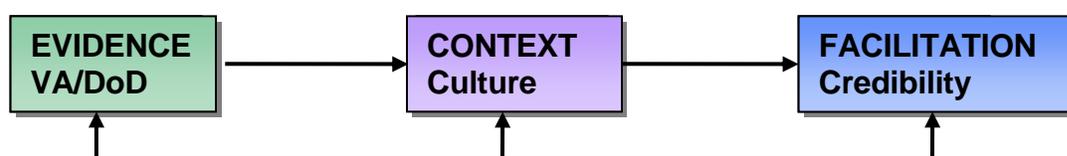
In the area of **recovery and secondary stroke prevention** our projects include:

- Addressing appropriate access to rehabilitation by veterans with moderate stroke severity
- Implementing evidence in detection and treatment of post-stroke depression,
- Evaluation of tele-rehabilitation technologies

**Conceptual Model for Implementation Research.** The Promoting Action on Research Implementation in Health Services (PARIHS) model is useful to help understand the complexity of implementing evidence based practices [Figure 7.2].<sup>39-41</sup> The PARIHS Model has been used extensively as a conceptual framework to guide implementation efforts among implementation science researchers in the VA.<sup>42, 43</sup> The model posits that successful implementation is a result of the characteristics of the evidence being implemented, the quality of the context, and the type of facilitation needed to produce a change in the process of care.<sup>39</sup> The PARIHS framework identifies '**Evidence**' as clinical guidelines; (research evidence), clinical experience (of providers), and patient experience. '**Context**' refers to the environment in which the proposed change is being implemented. Factors contributing to the context fall into 3 broad themes: culture, leadership and evaluation. Culture is influenced by the physical and social system; the workload

and complexity of patients, and resources. Leadership refers to decision making processes of the organization, organizational openness to change, and teamwork. Evaluation includes feedback on individual, team and system performance, and use of multiple sources for feedback such as clinical care. **'Facilitation'** enables the implementation of evidence into practice. Key facets of facilitation are also organized into 3 themes: purpose, role and skills, and attributes of the facilitator. Organizational dynamics play a role in promoting implementation. Moreover, facilitators with specific skills and attributes serve a role in enabling implementation among its organizational members.

**Figure 3: Conceptual Model Guiding Implementation**



The Stroke QUERI incorporates the PARIHS framework to guide its implementation efforts over the continuum of stroke care and through the Classic Six-Step QUERI Process:

1. Identify high risk/high burden conditions
2. Identify best practices
3. Define existing practice patterns in VA and variations from best practices
4. Identify (or develop) and implement programs to promote best practices
5. Document outcome and system improvements
6. Document improvements in health-related quality of life

The Stroke QUERI Implementation efforts are planned across Evidence, Context, Facilitation and Interventions. In Workgroup 1, our team contributed to the development of stroke clinical guidelines for stroke rehabilitation and acute management of stroke. Moreover, our workgroups have developed strategies to increase the awareness and knowledge of stroke clinical guidelines (e.g. EES program; Multidisciplinary Stroke Clinic; SQUIDSS) to increase implementation of the guidelines.

Across Workgroups 2, 3, and 4, we received funding to evaluate implementation interventions and have incorporated contextual factors to determine their influence on implementation of evidence-based practices. Examples include:

- Dr. Linda Williams' Post Stroke Depression project, includes organizational factors from Dr. Elizabeth Yano's national 2006 VA organizational survey

- Dr. Teresa Damush's Adapting Tools implementation project has included an organizational psychologist as a consultant to assist with organizational change and adaptation of the existing tools into practice
- Dr. Neale Chumbler's recently funded tele-health RCT project has included an assessment of organizational factors

The Stroke QUERI Workgroups have been active in developing tools to facilitate the implementation of evidence-based practices, including:

- Workgroup 1 is resubmitting the SQUIDSS development and testing SDP in December 2006. This is a stroke quality improvement support system that will interface with CPRS
- Workgroup 2 includes Dr. Chumbler's home rehabilitation telehealth program, and this group has begun working on the Stroke Scorecard to evaluate quality of stroke care performed across the continuum of care
- Workgroup 3 efforts have targeted the patients directly to implement evidence-based practices (e.g. Direct to consumer Sarge campaign, Clinical Decision Making for Stroke Prevention, Secondary Stroke Prevention Tools)
- Workgroup 4 is modifying the current depression screener in the VA to target post stroke survivors and testing a stroke self-management program

**Stroke QUERI Process.** The Implementation Pipeline (Figure 2) shows each workgroup portfolio of planned, ongoing and completed projects in FY 2006. Table 1, Figure – Contribution, and Figure 6 further expands on the Stroke QUERI's impacts, contributions, partners, and products. Progress has been made over the last year in the QUERI's goals to improve stroke care across the continuum. There has been a progression of work from small pilots, and rapid response projects to larger studies that lead to more specific implementation activities. Examples of these progressions include:

- A pilot project (LIP) supporting focus groups of caregivers supported the development of a large national caregiver survey and is also contributing to development of culturally sensitive Web-based stroke educational materials.
- A pilot project (LIP) to develop tele-health dialogues for stroke patients contributed to the successful funding of a tele-health trial of stroke rehabilitation. Findings from the pilot study, which interviewed veterans and their caregivers about their experience with stroke, post-discharge stroke recovery needs, and their experiences with the CCHT (VA Care Coordination/Home Telehealth) program, highlighted the complexity of managing stroke recovery, the need for care coordination across the continuum, and follow-up post-

discharge. CCHT can provide a link to the VA for veterans and their caregivers post-discharge.

- A prior implementation planning grant and a National Institute of Neurological Diseases and Stroke funded randomized trial of post-stroke depression supported the successful funding of a project to implement evidence for the detection and treatment of post-stroke depression.
- An Implementation IIR focused on adapting and implementing existing tools for secondary stroke risk factor management was awarded. This project builds on our Process and Outcomes study.

Comparison of our Implementation Pipeline from last year (FY 2005) to this year (FY 2006) demonstrates transitions of our work from evaluation of clinical practices to more active implementation activities where we partner with front-line providers to change practices (e.g., post stroke depression screening and treatments; tailoring secondary stroke risk management).

As outlined in Table 5. Impacts, Contributions and Products, our accomplishments are impacting the process of care, supporting the development of clinical practice decision support tools, and development of improved patient and family educational materials.



**Table 5. Projects in the Implementation Pipeline**

**ONGOING PROJECTS**

Project Label	Title	PIs	Number	Project Period
<b>Brief Description</b>				
<b>Workgroup 1</b>				
NRI Caregivers	Informal Caregivers of Veterans Post Stroke	Maude Rittman	NRI 05-246	4/06 – 03/08
The long-term goal of this line of research is to support veteran stroke survivors to live independently in their own home and communities for as long as possible. The aim of this study is to determine the relationship between veteran and caregiver characteristics and positive and negative responses to stroke caregiving and to ultimately develop appropriate patient and caregiver educational materials.				
Fear of Falling	The Exploration of the Development of Fear of Falling After Stroke	Arlene Schmid	XNV 87-60	09/06 – 08/07
The objective of this longitudinal study is to survey post-stroke individuals to estimate the prevalence of fear of falling and to better understand the timing and consequences of the development of the fear of falling and the impact on activity and participation after stroke. The ultimate goal is to use these data to develop patient-centered intervention to improve activity and participation after stroke.				
<b>Workgroup 2</b>				
Acute vs. Subacute	VHA Costs of Acute vs. Subacute Rehabilitation Care for Stroke	Bruce Vogel	RRP	11/06 – 04/07
Based on findings from the previous study (Processes and Outcomes of Stroke Care in the VHA), the expected outcome of this study is a body of economic information that will provide empirical evidence regarding the value and effects of two differing rehabilitation structures of care (rehabilitation in acute vs. subacute rehabilitation units).				
Rehab Cost	Cost-Effectiveness of Stroke Rehabilitation Settings in the VA	Bruce Vogel Dean Reker		01/07 – 06/09
In this project variations in treatment costs, outcomes, and cost-effectiveness of rehabilitation services for VHA stroke patients in six alternative post-stroke settings (from no rehabilitation care to rehabilitation in a specialized acute rehab unit) will be examined providing critical guidance to VHA clinicians, planners and administrators concerning how to achieve maximal functioning for veterans.				
Support Indicator	Service Activity: VA National Supporting Indicator	Diane Cowper	NA	10/05 – ongoing
This service activity started one year ago. The first full year of the Supporting Indicator has been documented, showing the national average of 22.3% of all stroke patients in the moderate impairment groups are receiving intensive rehabilitation, and that there is considerable variation across VISNs (range: 8.2% - 43.3%).				

Perform Measure	Service Activity: Performance Measure National Rollout of FY 2007 in Collaboration with OQP	Diane Cowper	NA	10/02 – ongoing
Since the initiation of the Performance Measure using the strategy of forming collaborations with Physical Medicine and Rehabilitation Services, and the Office of Quality and Performance, we are observing changes in patient care; for example, the capture rate in assessment of functional status of stroke survivors rose from an average of 65% in FY 03 to 87.6% in FY 06; and absolute increase of more that 20%.				
Telehealth Trial	Home-Based TeleHealth Stroke Care: A Randomized Trial for Veterans	Neale Chumbler Helen Hoenig	IRB 241-2006	10/06 – 09/09
The purpose of this study is to examine a Tele-rehabilitation (TR) intervention that uses tele-health technology to improve outcomes of stroke patients after discharge to home. The primary aim is to determine the effect of TR on physical function, and secondarily to determine the effect on disability, falls-related self-efficacy, and patient satisfaction.				
<b>Workgroup 3</b>				
Sarge	Disseminating Stroke Prevention Materials to Veterans: Development of a Direct-to-Consumer Implementation Strategy (“Sarge Campaign”)	Rebecca Beyth	QLP 71-001	05/05 -09/06
This project developed and disseminated stroke prevention materials (distributed 882 packets to veterans and providers) using Mort Walker’s Beetle Bailey cartoon “Sarge” character to demonstrate stroke risk behaviors and management directly to veterans during National Stroke Awareness month using multiple delivery methods at two VA medical centers and their supporting CBOCs in VISN 8 and 11.				
Educ Material	Education Materials for Puerto Rican Veterans and Families	Connie Uphold Maude Rittman	RRP 06-185	11/06 – 05/07
The overall objective of this project is to adapt existing education materials to help Puerto Rican OIF/OEF veterans and their families readjust to life returning home. The adapted education materials will be pilot tested and the most effective methods to disseminate the materials and help the veterans and families to access the materials will be evaluated.				
Decision Making	Improved Clinical Decision Making for Stroke Prevention	Rebecca Beyth Debra Wilson	RRP 06-153	10/06 – 09/07
This project addresses the gaps in decision making by developing and implementation process and testing the feasibility of using a previously validated clinical decision making tool, “Making Choices: An Atrial Fibrillation Treatment Decision-Making Aid”. The results will provide important information about the feasibility of using the decision making tool throughout the VA.				
Adapting Tools	Adapting Tools to Implement Stroke Risk Management to Veterans	Teresa Damush Linda Williams	IIR 05-297-1	01/07 – 12/09
This study will develop an evidence based, implementation strategy to adapt existing stroke tools for stroke prevention in the VA, and estimate the effect size to test the impact of a future regional and national roll-out.				
Anti-Thromb	Improving Anti-Thrombotic Use in Stroke Prevention	Rebecca Beyth	7 R01 H1070 794	10/02 – 09/07
This study is a randomized controlled trial of an intervention (the RBC) to increase the appropriate use of anti-thrombotic therapy (warfarin and aspirin) for stroke prevention in patients with chronic atrial fibrillation.				

### Workgroup 4

PSD	Implementing Evidence in the Detection and Treatment of Post-Stroke Depression	Linda Williams Teresa Damush Rebecca Beyth	IMV 04-096	01/06 – 12/08
This project will provide important insight into the patterns of care post-stroke so that the best sites for intervening to improve depression detection and treatment can be identified. The project will also provide key insights into patient and provider-perceived barriers to depression detection and treatment after stroke.				
Anti-Dp Trt	Depressed Mood and Antidepressant Treatment Among Post-Stroke Veterans	L. Douglas Ried	D3487R	05/05 – 04/08
This project has several objectives including establishing the prevalence of mood disorders and utilization of antidepressant (ADT) medications among post-stroke veterans six months before and up to one-year after the stroke event; establish the sensitivity and specificity of mood disorders ICD-9-CM codes in existing VA automated databases; and establish the feasibility of conducting a nationwide retrospective study of recent treatment practices.				
PSD Educ	Stroke Education in VISN 8 and 11	Teresa Damush Laurie Plue Linda Williams	QUERI Funded	01/06 – 10/06
The objective for this study was to collect data on the methods and materials currently used to educate veterans receiving stroke care at any VISN 8 or 11 facilities. Surveys have been completed at all facilities.				

### COMPLETED PROJECTS

#### Workgroup 1

Process & Outcomes	Processes and Outcomes of Stroke Care in the VHA	Dean Reker Pamela Duncan	03131-R	07/03 – 03/06
Identified gaps in practice and have targeted implementation projects to decrease the gaps (e.g., depression screening and management, patient and family education, and dysphagia)				
Pilot Caregivers	Informal Caregivers of Veterans Post Stroke	Maude Rittman	QLP 71-002	05/05 -04/06
The findings from this pilot study were used to refine a caregiver survey and to describe domains of informal stroke caregiving.				
Cultural Models	Culturally Sensitive Models of Stroke Recovery and Caregiving After Discharge Home	Maude Rittman	NRI 98-183	10/00 – 03/06
Results of this study indicate that the recovery of stroke survivors varies by race/ethnicity in (a) functional status, (b) activities of daily living, (c) depression, (d) sense of self, (e) connectedness, (f) social participation. Across the board Puerto Ricans on average were more impaired (functional status and activities of daily living) at discharge and experienced slower recovery across the 24 month time period.				

### Workgroup 2

VA/NonVA Util	VA and Non-VA Utilization by Veterans with Acute Stroke	Huanguang Jia	IIR 03-151	07/04 – 06/06
This study found that using multiple sources for post-stroke care was common among VHA stroke patients in Florida. In addition, while VHA-initial inpatients received less rehabilitation services than the Medicare patients, VHA provided a safety net for multiple-system enrollee users who need post-stroke rehabilitation. This study informed the development of the planned project “VA and Non-VA Healthcare Utilization and Outcomes by Veterans with Stroke”.				
Telehealth Dialogues	Home-Based Tele-Health Stroke Care: Validation of Evidence-Based Disease Dialogues	Neale Chumbler	QLP 71-003	05/05 – 04/06
The purpose of this LIP was to collect pilot information that supports the development and initial testing of the VA care coordination/home-telehealth (CCHT) of disease management dialogues for veterans with stroke and their caregivers. This study informed the development of the ongoing project “Home-Based TeleHealth Stroke Care: A Randomized Trial for Veterans”.				
NH QOC Indicators	Quality of Care Indicators for Veterans with Stroke in Community Nursing Homes	Huanguang Jia	IIR 02-284	02/04 – 01/06
This study define characteristics of community nursing homes where veterans receive their care versus community nursing homes that do not treat veterans, compared Centers for Medicare and Medicaid Services Minimum Data Set nursing home facility-level quality indicators, and examined patient-level variation in therapy utilization, and determine patient-level outcome variations.				

### Workgroup 3

Coagu Care	Formative Evaluation of an INR Home Monitoring Program in the VA Sunshine Health Network	L. Douglas Ried	STR 04-347	06/04 – 09/04
This study found, that despite expressed satisfaction from patients, the Coagu Care Program INR Monitoring Project for self-managed care has system, patient and technological barriers to full program participation and access to care that would need to be improved before this program is expanded to other VA facilities.				
Blood Pressure	Electronic Medical Record (EMR) and Focus Group Evaluation of Blood Pressure Control after Stroke: Assessing Strategies to Support Self Management of Blood Pressure after Stroke	Linda Williams	HFP 05-187	05/05 – 10/05
This study found that despite improving blood pressure control across the VA, most veterans do not meet EPRP goals for blood pressure control post-stroke. Patients and providers identified multiple modifiable characteristics that may be impacting this poor control.				

### Workgroup 4

AIM Trial	AIM: A Randomized Trial of PSD Care Management	Linda Williams	RO1INS39571-01	09/00 – 09/05
This study evaluated the effectiveness of a multi-faceted, 12 week intervention (AIM) that sought to activate patients to be aware of post-stroke depression, initiate antidepressant treatment and monitor treatment side effects and compliance.				

## PLANNED PROJECTS

### Workgroup 1

SQUIDSS	The Development and Feasibility Test of Implementing SQUIDSS: A Stroke Quality Improvement Decision Support System	Thomas Kent	SDP 06-004	2 <sup>nd</sup> Submission 03/07
The objective for this project is to develop and evaluate the implementation of a computer based quality improvement, decision support and outcomes monitoring tool for veterans admitted with ischemic stroke or transient ischemic attack (TIA). This SDP will be the first developmental step toward development of tools to promote interdisciplinary implementation of acute stroke guidelines, systematic methods for monitoring stroke care, and mechanisms for tracking patients' outcomes for quality benchmarking.				
WebBased	Web-Based Informational Materials for Caregivers of Veterans Post Stroke	Melanie Sberna Constance Uphold	SDP 06-327	1 <sup>st</sup> Submission 12/06
The primary objective of this SDP is to implement tailored, culturally sensitive, useable, and appropriate Web-based informational materials for stroke caregivers and health care providers on the My HealthVet (MHV) Website.				
Dysphagia	Implementation Project on Stroke and Dysphagia Assessment	Neale Chumbler	NA	1 <sup>st</sup> Submission 06/07
A recent report by the Office of the Inspector General that evaluated the management of patients with feeding and swallowing problems in VHA medical facilities and found significant variations in dysphagia evaluation and management. In response to this report this project will develop a Performance Measure for stroke and dysphagia assessment. It will be the first project developed under the Stroke QUERI Scorecard Project.				

### Workgroup 2

Scorecard	Service Activity: Stroke Continuum of Care Scorecard	Neale Chumbler	NA	10/06 - ongoing
This service activity is a new initiative for the Stroke QUERI to partner with the Office of Quality Performance and the Patient Care Services (Primary Care, Neurology, Physical Medicine and Rehabilitation, Nursing Services, Geriatrics, and Extended Care) to develop and evaluate the feasibility of a Stroke Scorecard to measure the quality of stroke care across the continuum of care.				
VA/NonVA Util/Out	VA and Non-VA Healthcare Utilization and Outcomes by Veterans with Stroke	Huanguang Jia	IIR 06-108-02	Funded to start 01/07
The focus of this study is to understand the process and outcomes of post-stroke care by VA stroke patients who are VA-only users versus stroke patients who are Medicare-only users or VA-Medicare dual users.				

### Workgroup 3

VA CCHT Cost	Examining the Cost Effectiveness of a VA CCHT Program for Hypertension	Neale Chumbler Bruce Vogel	SDP 06-179	Funded 04/07 – 03/10
The objective of this study is to evaluate the cost-effectiveness of a VA Care Coordination/Home Telehealth (CCHT) program compared to usual care for veterans at three VAMCs in VISN 8, and to identify both the qualitative and quantitative patient and organizational characteristics of the CCHT program that contributed to its success (e.g., improved cost effectiveness).				

Go To Sleep	DiaGnOsis and Treatment of Sleep Apnea in Cerebrovascular Disease (Go To Sleep)	Dawn Bravata H. Klar Yaggi		2 <sup>nd</sup> Submission 12/06
The objective of this project is to demonstrate the effectiveness of using the VHA electronic medical record to identify veterans with cerebrovascular disease who have hypertension and obesity, risk factors for sleep apnea, and to demonstrate the effectiveness of a strategy (auto-titrating CPAP) for treating sleep apnea, that if found effective, can be implemented across VHA medical centers				
<b>Workgroup 4</b>				
No planned projects to report at this time				

**Table 6. Impacts, Contributions and Products**

<b>Description</b>  Key: Diss Core = Dissemination Core, Impl Core = Implementation Core; Method Core = Methodology Core  NOTE: Project Labels are listed in Table 5. Projects in Implementation Pipeline, page 24 Clinical Goals are listed on page 16 Implementation Goals are listed on page 16	<b>Project Label</b>	<b>Workgroup</b>	<b>Clinical Goals</b>	<b>Implementation Goals</b>
<b>IMPACTS</b>				
<b>Process-of-care / performance improvements</b>				
<ul style="list-style-type: none"> <li>Assessment of functional status of stroke survivors (OQP – Performance Indicator) rose from an average of 65% in FY03 to 87.6% in FY06; an absolute increase of more than 20%, since the initiation of the Performance Measure.</li> </ul>	Perform Measure	2	5, 7	9
<ul style="list-style-type: none"> <li>Established front line provider teams in VISN 8 and 11 to modify the VA depression screener for veterans with stroke.</li> </ul>	PSD	4	4	5
<ul style="list-style-type: none"> <li>Median 8-point drop in systolic blood pressure in stroke patients with follow-up in multidisciplinary clinic</li> </ul>	** Multidisc Stroke Clinic	1	1, 2, 3, 4	3b, 3c
<ul style="list-style-type: none"> <li>Percentage of patients with blood pressure on target improved from 49-70% from first evaluation to the last visit in the multidisciplinary clinic</li> </ul>	** Multidisc Stroke Clinic	1	1, 2, 3, 4	3b, 3c
<b>Morbidity performance improvements</b>				
<ul style="list-style-type: none"> <li></li> </ul>				
<b>Mortality performance improvements</b>				
<ul style="list-style-type: none"> <li></li> </ul>				
<b>Quality of life improvements</b>				
<ul style="list-style-type: none"> <li>Identified the need for development of culturally sensitive usable, age appropriate web-based information for caregivers.</li> </ul>	Cultural Models	1	3	6
<b>Cost/utilization savings</b>				
<ul style="list-style-type: none"> <li>Median stroke care cost savings of \$4,293 in veterans receiving multidisciplinary stroke care vs. usual care</li> </ul>	** Multidisc Stroke Clinic	1	1, 2, 3, 4	3b, 3c

**\*\* Multidisc Stroke Clinic – Refers to the Stroke QUERI LIP: “Implementation of Post-Stroke Guidelines in a Multi-Disciplinary Stroke Clinic”, funded from July 2004 to Sept 2004. Patient accrual continued to FY 2006, and impacts realized and reported in FY 2006.**

<b>Other Patient and System Impacts</b>				
<ul style="list-style-type: none"> <li>Developed collaborative working relationships with the VA Caribbean Health Care System to identify the unique needs of their stroke population and their caregivers. This health care system has the second largest volume of stroke patients within the VA system. The collaborative working relationship include the Medical Chief of Staff, Research Program, Nursing, PM&amp;R, and Neurology.</li> </ul>	Cultural Models NRI Caregivers Educ Material, Anti-depress Trt	1	3	6
<ul style="list-style-type: none"> <li>Analyses found, that despite expressed satisfaction from patients, the Coagu Care Program has system, patient, and technological barriers to full program participation and access to care that would need to be improved before this program is expanded to other VA facilities.</li> </ul>	Coagu Care	3	1	3
<ul style="list-style-type: none"> <li>Increased awareness of veterans and providers on stroke and risk factors for stroke; with a total of 882 educational packets requested (440 of the requests were from veterans). Qualitative evaluation of the Sarge Campaign revealed that it was totally informative, brought awareness that stroke was a real risk, and that the colorful presentation attracted the veterans' attention. A veteran wrote, "You guys are doing great things for us veterans. I am very grateful for the services provided."</li> </ul>	Sarge	3	1	3
<b>CONTRIBUTIONS</b>				
<b>Contributions to VHA activities/entities</b>				
<ul style="list-style-type: none"> <li>In collaboration with the VA Evidence Based Workgroup and the American Stroke Association Scientific Oversight Committee, the VA/DOD post-stroke guidelines were published in the journal, Stroke. This is the fifth most quoted article in the Stroke journal and establishes the VA/DOA guidelines as a model for stroke care nationally and internationally.</li> </ul>		1	7	1, 2
<ul style="list-style-type: none"> <li>Members of the Stroke QUERI Executive Committee are leading the development of the acute stroke clinical practice guidelines to be released in FY07.</li> </ul>	SQUIDSS	1	7	1
<ul style="list-style-type: none"> <li>Collaborated with the VA Caribbean Health System to assess needs of stroke survivors and their families.</li> </ul>	NRI Caregivers	1	3	6
<ul style="list-style-type: none"> <li>Collaborated with the My HealthVet to plan a project to develop culturally sensitive patient and provider educational materials.</li> </ul>	WebBased	1	3	5, 6, 8, 10
<ul style="list-style-type: none"> <li>Collaborated with the Houston VA to develop an implementation project to create a decision support system for acute stroke management.</li> </ul>	SQUIDSS	1	1, 2, 7	4, 5, 8, 10
<ul style="list-style-type: none"> <li>Audited 23 VA health care facilities to assess stroke guideline compliance, and surveyed staffing and organizational factors.</li> </ul>	Process and Outcomes	1	1, 2, 7	5, 8
<ul style="list-style-type: none"> <li>Initiated a Stroke QUERI activity to collaborate with Patient Care Services (audiology and speech and language, PM&amp;R, neurology, and nursing), OQP, and the National Dysphagia Task Force to create in FY 07 a performance measure for dysphagia and stroke.</li> </ul>	Dysphagia	1	2	5

<ul style="list-style-type: none"> <li>Implementation Research Coordinators presented Cyberseminars on implementation methods in June and July 2006 which is archived on the HSR&amp;D website.</li> </ul>	Impl Core	Impl		
<ul style="list-style-type: none"> <li>Implementation Research Coordinator served on VA Clinical Decision Support Workgroup Committee IMPROVE (led by VA Drs. Graber and Pogach).</li> </ul>	Impl Core	Impl		
<ul style="list-style-type: none"> <li>Implementation Research Coordinator participated in the VA SOTA on the complexity of chronic care, Sept 2006.</li> </ul>	Impl Core	Impl		
<b>Consultation efforts</b>				
<ul style="list-style-type: none"> <li>Consultants for the American Stroke Association and JCAHO to develop quality indicators for stroke care.</li> </ul>		1	1, 2, 5, 7	2, 5
<ul style="list-style-type: none"> <li>Implementation Research Coordinators leads the implementation core in providing consultation on implementation methods and evaluation for Stroke QUERI investigators and affiliates.</li> </ul>	Impl Core	Impl		
<b>Other contributions</b>				
<ul style="list-style-type: none"> <li>Disseminated information, using existing technology and communications channels within VA, to a large audience at little or no cost to raise stroke awareness. Two "Hey VA" and two Earnings and Leave statements on stroke risk factors reached over 200,000 VA employees, many who are veterans.</li> </ul>	Diss Core	Diss	1, 3	6
<ul style="list-style-type: none"> <li>Provided articles for variety of VA Newsletters to raise awareness about stroke and current activities in the Stroke-QUERI. Articles appeared in Research FORUM, Research Currents, THNRS Newsletter and an article has been accepted for publication in the November 2006 issue of the Society of General Internal Medicine (SGIM) Newsletter, FORUM.</li> </ul>	Diss Core	Diss	1, 3	
<ul style="list-style-type: none"> <li>Presentation on Web based dissemination methodology at the TRIPP conference, Washington, DC in July 2006 by the Stroke QUERI Dissemination Coordinator.</li> </ul>	Diss Core	Diss		
<b>CLINICAL PRACTICE PRODUCTS</b>				
<b>Clinician education materials</b>				
<ul style="list-style-type: none"> <li>Developed and deployed at two sites a post-stroke depression clinician education talk/slide set.</li> </ul>	PSD	4	4	5
<ul style="list-style-type: none"> <li>Developed a post-stroke depression decision support document for the Stroke QUERI website that will be accessible from the provider depression reminder in CPRS. This document prompts guideline adherent action for initiating and monitoring antidepressant treatment post-stroke.</li> </ul>	PSD	4	4	5
<ul style="list-style-type: none"> <li>Developed and evaluated a post-stroke depression care management program that included patient activation/education, initiation of antidepressant treatment, and telephone monitoring of treatment effectiveness and side effects. Aspects of this program have been adapted into the current PSD Implementation IIR.</li> </ul>	PSD Educ	4	3	5
<ul style="list-style-type: none"> <li>Published invited editorial putting the Feed Or Ordinary Diet (FOOD) after stroke trials in a clinical context for the <i>Annals of Internal Medicine</i>. Within six months of publication, this editorial had been downloaded from the journal website 5,409 times.</li> </ul>		1	2, 7	1, 2

<b>Patient education materials</b>				
<ul style="list-style-type: none"> <li>Developed and disseminated stroke prevention materials using Mort Walker's Beetle Bailey cartoon "Sarge" character to demonstrate stroke risk behaviors and management directly to veterans during National Stroke Awareness month using multiple delivery methods at two VA medical centers and their surrounding CBOCs in VISN 8 and 11.</li> </ul>	Sarge	3	1, 3	6
<ul style="list-style-type: none"> <li>Developed partnerships with the VHA National Center for Health Promotion and Disease Prevention (NCP), VA Office of Public and Intergovernmental Affairs, and Office of Research and Development helped by taking the message to VA clinicians, and employees via their websites, emails, monthly conference call, VA Research Currents newsletter, and VA employees' Earning and Leave (E&amp;L) statements.</li> </ul>	Sarge	3	1, 3	6
<ul style="list-style-type: none"> <li>Designed a post-stroke self-management program focused on decreasing depression symptoms, improving self efficacy, and enhancing healthy behaviors post-stroke. This program is being evaluated in the current PSD Implementation IIR.</li> </ul>	PSD	4	4	5
<b>Other clinical practice support tools</b>				
<ul style="list-style-type: none"> <li>Developed an evidence-based disease management dialogue tailored for stroke patients and their informal caregivers which, following further tailoring, can be used by the Office of Care Coordination to be disseminated to the field for care coordinators.</li> </ul>	Telehealth Dialogues	3	1, 2, 3	5
<ul style="list-style-type: none"> <li>Currently adapting and testing the feasibility of using a clinical decision aid for atrial fibrillation (AF) management.</li> </ul>	Decision Making	3	1, 3	5, 6, 8
<ul style="list-style-type: none"> <li>Worked with front-line clinicians to adapt the existing CPRS depression screening tool as a post-stroke depression screening reminder (modified at Indianapolis and N. Florida/S. Georgia VAMCs).</li> </ul>	PSD	4	4	5
<ul style="list-style-type: none"> <li>Partnered with Indianapolis IRM and CoE data management staff to develop a VISTA data extraction tool for efficient measurement of depression screening and management quality of care indicators. This data extraction tool supports evaluation of VISN quality improvement activity. This tool has been successfully deployed in VISN 8 and 11 as part of our PSD Implementation IIR.</li> </ul>	PSD	4	4	5
<b>RESEARCH PRODUCTS</b>				
<ul style="list-style-type: none"> <li>Established that compliance with clinical practice guidelines improves patient outcomes at discharge and increases the probability of being discharged to the community.</li> </ul>	Process and Outcomes	1	7	3
<ul style="list-style-type: none"> <li>Demonstrated that the largest gaps in practice are in patient and family education.</li> </ul>	Process and Outcomes	1	3, 7	3b, 3c
<ul style="list-style-type: none"> <li>Identified gaps in patient and family education post-stroke.</li> </ul>	NRI Caregivers	1	3	6
<ul style="list-style-type: none"> <li>Developed the National Caregiver Survey.</li> </ul>	Pilot Caregivers	1	7	

<ul style="list-style-type: none"> <li>Findings from our caregiver research have lead to the Web-Based Information projects to develop culturally sensitive web-based informational materials. Across Dr. Rittman's caregiver projects we have determined the burden of caregiving post-stroke and that Puerto Rican caregivers use more help and spend more time in caregiving. In addition, African American caregivers have fewer depressive symptoms.</li> </ul>	NRI Caregivers	1	3	6
<ul style="list-style-type: none"> <li>Conducted a survey of all facilities in VISN 8 and 11 to determine stroke education materials and processes currently used to promote patient and caregiver education post stroke.</li> </ul>	QUERI funded	1	3	6
<ul style="list-style-type: none"> <li>Found that veterans who used two or three sources of care (e.g., VHA-Medicare, VHA-Medicaid, &amp; VHA-Medicare-Medicaid) were more likely to be re-hospitalized in general as well as for recurrent stroke than the VHA only users 12-month post-index stroke.</li> </ul>	VA/Non-VA Util	2	6	3
<ul style="list-style-type: none"> <li>Highlighted the complexity of managing stroke recovery, the need for care coordination across the continuum, and follow-up post-discharge, and further suggested that CCHT (VA Care Coordination/Home Telehealth) can provide a link to the VA for veterans and their caregivers post-discharge.</li> </ul>	Telehealth Dialogues	2	2, 3	3
<ul style="list-style-type: none"> <li>Found that 22.3% of all stroke patients in the moderate impairment groups are receiving intensive rehabilitation since tracking of the Supporting Indicator began.</li> </ul>	Support Indicator	2	5, 7	9
<ul style="list-style-type: none"> <li>Confirmed that a high proportion of VHA Florida enrollees with stroke were dually and triply eligible and/or enrolled with Medicare and Medicaid. This project lead to a national study.</li> </ul>	VA/NonVA Util	2	6	7
<ul style="list-style-type: none"> <li>Identified a strong need to coordinate post-stroke care in terms of post-stroke providers. A lack of coordination in this area can lead to over-utilization because many who are eligible for multiple sources enroll in multiple programs.</li> </ul>	VA/NonVA Util	2	6	7
<ul style="list-style-type: none"> <li>Findings can assist healthcare planners and clinicians in understanding the post-stroke inpatient utilization behavior and healthcare continuity of VHA enrollees diagnosed with stroke. It further signifies the importance of incorporating veteran Medicare data in rehabilitation outcome research, and a better understanding of matching and merging VHA and Medicare data.</li> </ul>	VA/NonVA Util	2	6	7
<ul style="list-style-type: none"> <li>Collaborated with VISN 8 VA Care Coordination/Home Telehealth (CCHT) program and submitted a Service Directed Project to evaluate the cost-effectiveness of this program compared to usual care among veterans with hypertension. Organizational characteristics of successful programs will be identified.</li> </ul>	VA CCHT Cost	3	1, 6	7, 8, 10
<ul style="list-style-type: none"> <li>Analysis of clinical administrative databases showed that in FY01, the percentage of veterans with AF who received warfarin varied from 21-51% among the VISNs, and that ~40% of veterans with acute stroke and AF received warfarin within 4 weeks post stroke in the VHA in FY01, showing that AC practice in the VHA is equivalent or better than the private sector's practice pattern.</li> </ul>	Method Core	3	1	

<ul style="list-style-type: none"> <li>Found that stroke patients with AF have improved survival compared to those not receiving warfarin, they do not appear to have lower stroke rates, MI or bleeding events in analyses of the VA administrative data including the addition of Medicare data.</li> </ul>	Method Core	3		3
<ul style="list-style-type: none"> <li>Analyses of administrative data in FY01 have shown that warfarin use is significantly associated with reduced mortality after controlling for age, CHF, diabetes and prior stroke or TIA. Thus, the use of warfarin should be considered for high risk veterans who have acute stroke and AF.</li> </ul>	Method Core	3	1	
<ul style="list-style-type: none"> <li>Analyses showed that most veterans with stroke and AF in FY 01 were dually eligible patients (VA and Medicare users). Although the veterans had dual eligibility they received most of their post stroke care in the VA hospitals rather than in the community.</li> </ul>	Method Core	3	1	
<ul style="list-style-type: none"> <li>Data from our recently completed locally initiated project demonstrated that in VISN 11 only 26% of veterans within 12 months of stroke or TIA met the established VA performance criteria for hypertension management (having at least 75% of blood pressure measurements at or below goal).</li> </ul>	Blood Pressure	3	1	2
<ul style="list-style-type: none"> <li>Qualitative analyses from six veteran focus groups demonstrated the following patient barriers to blood pressure management post-stroke: reliance on symptoms to indicate when to monitor BP, lack of knowledge about their BP target, difficulty managing stress, and difficulty maintaining healthy diet and exercise.</li> </ul>	Blood Pressure	3	1	3
<ul style="list-style-type: none"> <li>Analyses found that among veterans responding to the clinic poster, most preferred requesting material via mail while clinicians preferred the Web, showing that direct-to-consumer marketing can be an effective method for delivery of health prevention materials and prompting behavior change for veterans, though the strategy should be tailored differently for patients and clinical providers.</li> </ul>	Sarge	3	1, 3	6, 8
<ul style="list-style-type: none"> <li>Conducted a two-site pilot study to establish an administrative data algorithm to accurately identify veterans with post-stroke depression. This algorithm is being validated in a VISN-8 study examining depression treatments before and after stroke.</li> </ul>	PSD Educ Anti-Dp Trt	4		5
<ul style="list-style-type: none"> <li>Demonstrated in a 5-year NINDS-funded RCT that care management is more effective than usual care for treatment of PSD (depression remission 39% vs. 23% at 12 weeks, p = 0.01).</li> </ul>	PSD Educ	4		5
<ul style="list-style-type: none"> <li>Determined characteristics related to the development of PSD so that high-risk patients can be identified prior to discharge. Factors independently related to developing PSD at 1-2 months post-stroke included age, prior history of depression, and medical co-morbidity.</li> </ul>	PSD Educ	4		5

## **I.8. Addressing Health Disparities**

The Stroke QUERI, in assessing the needs of caregivers, in the national caregiver survey, found that veterans and families are in need of appropriate educational materials. In addition, Stroke QUERI investigators have partnered with the VA Caribbean Health Care System, Puerto Rico, and have found that culturally appropriate educational materials on caregiving and stroke are greatly needed. The Stroke QUERI has selected to address health disparities based on the work with the VA Caribbean Health Care System. The San Juan VA Medical Center (SJVAMC), part of VISN 8, serves a population of 150,000 veterans in Puerto Rico and the U.S. Virgin Islands, and has the second largest number of stroke patients in the VA (FY 05: inpatients = 591, outpatients = 1,855) (FY 05 VHA Medical SAS Inpatient and Outpatient Datasets). This population tends to be less educated, have more health risk factors, and have limited access to computers and educational materials. A Stroke QUERI funded project, based on work in partnership with the San Juan VA Medical Center and Polytrauma and Blast-Related Injury QUERI, aims to pilot test and modify adapted educational materials for OIF/OEF Puerto Rican veterans and their families, and to determine the most effective methods to disseminate education materials, and to develop implementation methods to provide access to the materials.

A second project under development is also responding to the findings of the national caregiver survey. The primary objective of this service directed project (SDP) is to implement tailored, culturally sensitive, useable, and appropriate web-based informational materials for stroke caregivers and health care providers on the My Health<sub>e</sub>Vet (MHV) website. This informational material can be used by caregivers and health care providers to help manage and understand the process of post-stroke recovery at home. This proposed implementation project addresses the Veterans Affairs (VA)/Department of Defense (DoD) Clinical Practice Guidelines for the Management of Stroke Rehabilitation recommendations for the need to increase guideline compliance in the area of family education. This project is consistent with the QUERI's clinical goal 3 to improve the education of patients and caregivers about stroke prevention and stroke recovery, and the implementation Goal 8 to develop and evaluate direct to consumer strategies to facilitate the implementation of evidence-based practices.

## Part II. Overview of the Management Plan

### II.1. Overview

The Stroke QUERI's administrative structure has two centers. The **Research Coordinating Center**, directed by Dr. Pamela Duncan, is in the North Florida/South Georgia Veterans Health System, located in Gainesville, Florida. It houses the **Administrative Coordinator**, Dr. Jini M. Hanjian, who also supports implementation research efforts in Gainesville. This Center focuses on stroke guidelines development and implementation, and health services research. The **Clinical Coordinating Center**, directed by Dr. Linda S. Williams, is housed in the Richard L. Roudebush VA Medical Center in Indianapolis, Indiana. The **Implementation Research Coordinator**, Dr. Teresa Damush, and the Assistant Implementation Research Coordinator, Ms. Laurie Plue, are located in this Center. It focuses on post-stroke depression, clinical aspects of stroke care, and implementing interventions based on best practice. The **Operation Committee**, composed of the **Chair of the Executive Committee**, and **Leaders** of the **Workgroups** and **Core Teams**, and the Administrative Coordinator, supports and advises the research, implementation and administrative efforts of the QUERI (see Figure 5; Table 6. Staff and Executive Committee Roster).

The Stroke QUERI **Executive Committee** acts as the advisory body to the Center. In conjunction with the Coordinators, it develops the focus and direction of the QUERI, provides guidance for the strategic plan and goals, helps identify critical areas for implementation focused research, and develops critical partnerships both in and outside of the VA. It meets bi-annually, once by conference call, and once in-person. The Executive Committee is composed of nationally recognized leaders in stroke health care including representatives from the American Stroke Association, and the VA Office of Quality and Performance. The Committee also includes a veteran stroke survivor, Mr. Don Prether, and his spouse, Mrs. Jan Prether. Dr. David B. Matchar, Director of the Duke Center for Clinical Health Policy Research, and a Durham VA physician, began as Chair of the Executive Committee in 2006. He is committed to creating strong partnerships within the VA and across Non-VA entities for the QUERI that will facilitate its work in improving stroke care for veterans.

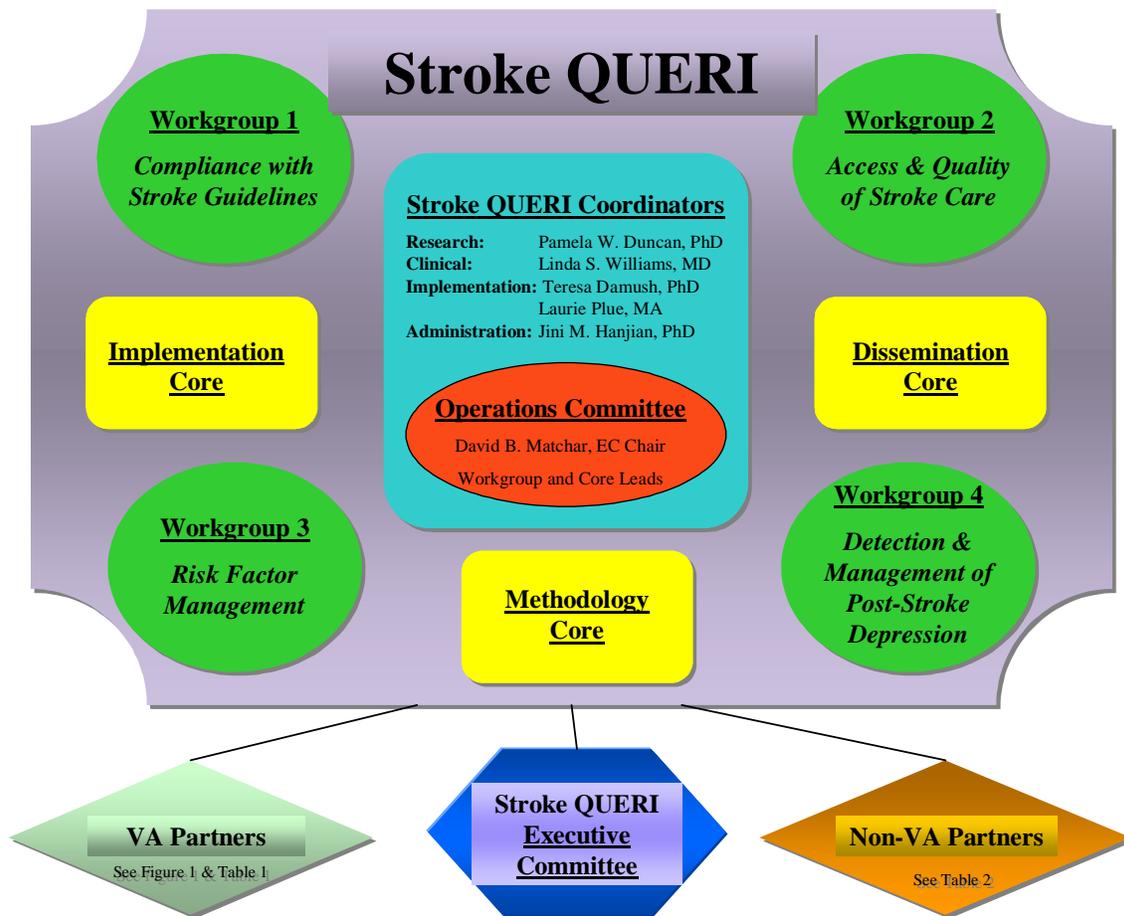
The Executive Committee held one face to face meeting in FY 2006, on June 16, 2006 in Gainesville, Florida. In 2005, our Executive Committee Chair, Dr. Larry Brass became very ill and died in March 2006. After Dr. Brass' death, with the approval of Dr. Joe Francis, we reevaluated the makeup of the Committee and invited new members and Dr. David Matchar accepted the

position as Chair of the Committee. The Executive Committee Chair meets every other week with the Stroke QUERI Operations Committee. In addition, a number of the EC members actively participate in workgroup activities. For instance, Dr. Robert Ruff is working with Workgroup 2 to formulate ideas for the Stroke Scorecard. Dr. Thomas Kent, and his nurse research coordinator, Ms. Jane Anderson, are actively engaged with Workgroup 1 and the Implementation Core to develop the SQUIDSS project. To strengthen our implementation strategies we invited Dr. Marita Titler to join the Executive Committee. Dr. Titler is a nationally recognized expert in translating research findings into nursing practice.

On June 16, 2006, the Executive Committee laid out a **future direction** and a **framework** for the Stroke QUERI based on the stroke continuum of care. The new framework provides the leadership with a clear guide for the QUERI's future research and implementation projects, and broadens its focus across the full spectrum of stroke care. The Stroke QUERI was charged by the Executive Committee to examine the use of the stroke continuum of care as a guiding principle in its Fiscal Year 2007 strategic plan. The stroke continuum of care conceptual model is explained in Section I.7 (Figure 2, page 19).

In addition, the Executive Committee directed that the continuum of care model be considered in the development of a **scorecard of quality stroke care** from primary prevention to recovery and secondary prevention. This was seen as an essential step in the progression of projects focused on implementing the VA/DOD stroke guidelines. The Executive Committee directed that in developing this project it was important for the Stroke QUERI to work with a variety of VA partners. Workgroup 2 has been reorganized and refocused to lead the work on the stroke care scorecard, beginning with the addition of new members representing neurology, OQP, patient care services, nursing, and quality performance managers, (see page 42).

Figure 5. Stroke QUERI Organization



## II.2. Roles of the Stroke QUERI Coordinators

The roles and functions of the Stroke QUERI Coordinators are briefly provided below with special emphasis on their roles in administering and executing the Center’s strategic plan.

- **Pamela Duncan, Ph.D., FAPTA, Research Coordinator.** In conjunction with the Clinical Coordinator, Dr. Duncan oversees all research, administrative, educational and dissemination activities of the Stroke QUERI. She leads the Stroke QUERI to achieve its mission, and executes and revises the strategic plan. Dr. Duncan acts a national spokesperson for the Stroke QUERI.
- **Linda S. Williams, M.D., Clinical Coordinator.** In conjunction with the Research Coordinator, Dr. Williams oversees all clinical research activities of the Stroke QUERI. She leads the Stroke QUERI to achieve its clinical and implementation mission, and

executes and revises its strategic plan, and acts a national spokesperson for the Stroke QUERI.

- **Teresa M. Damush, Ph.D., Implementation Research Coordinator.** Dr. Damush leads the Translation, Implementation and Evaluation Core of the Stroke QUERI. She works with the QUERI researchers and coordinators in identifying interventions that promote best practices, and provides support to the QUERI researchers in the development of implementation approaches/models.
- **Laurie Plue, M.A., Assistant Implementation Research Coordinator.** Ms. Plue works closely with Dr. Damush and facilitates the ability of the Stroke QUERI researchers to conduct implementation studies that change practice and enhance dissemination efforts.
- **Jini M. Hanjian, Ph.D., Administrative Coordinator.** Dr. Hanjian provides daily administrative support for the Stroke QUERI and its Coordinators. She is point of contact for the Stroke QUERI and works collaboratively with Stroke QUERI researchers, Executive Committee, VACO staff, RORC administrators and staff, NF/SGVHS staff and administrators, and outside agencies. Dr. Hanjian oversees the Stroke QUERI budget, development annual report/strategic plan, and related projects. Dr. Hanjian collaborates in the implementation efforts of the Gainesville Center.

### **II.3. Roles of the Workgroups, Core Teams and Their Leaders**

The **Workgroups** and their leaders and their members provide the organizational structure that manages a portfolio of activities and projects related to the Stroke QUERI's clinical and implementation research goals (See Table 2 and 3 for Projects, Table 1 for Impacts, Contributions and Products).

- **Workgroup 1. Compliance with Stroke Guidelines.** Leader: Pamela Duncan, PhD, FAPTA. For FY 2007, the Workgroup 1 portfolio of activities and research projects focus on:
  - Support of veteran stroke survivors so they may live independently in their own home and communities for as long as possible. Projects include, a national survey of informal caregivers of stroke survivors, looking at the fear of falling in stroke survivors and its impact, and providing web-based information for providers and caregivers.

- Compliance with stroke guidelines within the VA. Planned projects include the development of a provider's decision support system during acute care, and an implementation project in post stroke dysphagia.
- **Workgroup 2. Access and Quality of Stroke Care.** Leader: Neale Chumbler, Ph.D.  
For FY 2007, the Workgroup 2 portfolio of activities and research projects focus on:
  - Oversight of the continued monitoring of the existing Rehabilitation Performance Measures (i.e., stroke, TBI and amputation) and the creation of maps of the geographical variation in the percentage of patients assessed by the PM&RS National Program Office. The Geographical Information System (GIS) mapping is conducted on a quarterly basis. In addition, its investigators collaborate with PM&R Services and OQP to develop and validate methods for a Supporting Indicator (SI) in rehabilitation.
  - Develop of a **scorecard of quality stroke care** across the continuum. Workgroup 2 was reorganized in the later part FY 2006 to include several new members creating a diverse and experienced team of researchers and clinicians. They will work in partnership with the Office of Quality and Performance in the development and implementation of the scorecard. The ultimate goal of the scorecard is to help decrease the gaps in practice and improve quality of stroke care and stroke outcomes.
  - Examination of the access, utilization, costs, and quality of stroke care, and development of tools and technologies. Projects include, assessments of costs of rehabilitation care settings, utilization and outcomes of veterans with stroke in VA and Non-VA settings, the use of quality assessments, and emerging tele-health technologies.
- **Workgroup 3. Risk Factor Management.** Leader: Rebecca Beyth, M.D., M.Sc., and David B. Matchar, M.D. For FY 2007, the Workgroup 3 portfolio of activities and research projects focus on:
  - Understanding of patient, provider and systems factors including facilitators and barriers to improving care. Projects include, an implementation process for improved clinical decision making for stroke prevention, the use of warfarin therapy for stroke prevention in patients with chronic atrial fibrillation for primary and secondary prevention, an implementation project adapting tools for stroke risk management, and validating home-based tele-health stroke care.

- Extending the stroke risk factor awareness dissemination projects to a larger VA audience. Projects include extending the successful “Sarge” pilot project that provided stroke prevention materials to veterans, and targeting educational materials on stroke to Puerto Rican OIF/OEF veterans, their families and healthcare providers.
- **Workgroup 4. Detection and Management of Post-Stroke Depression.** Leader: Linda S. Williams, M.D. For FY 2007, the Workgroup 4 portfolio of activities and research projects focus on:
  - What are current practices in PSD screening and what factors are limiting or facilitating best practices in PSD screening? What are current practices in PSD treatment and what factors are limiting or facilitating best practices in PSD treatment? What implementation strategies can we use to change practices and increase the proportion of veterans screened and treated for PSD? Projects continue to focus around the two ongoing Merit Review projects, including ongoing assessment of the fidelity of an implementation intervention, assessments of barriers and facilitators to implementation in this setting, and feedback to the two facilities on performance in depression screening and treatment.

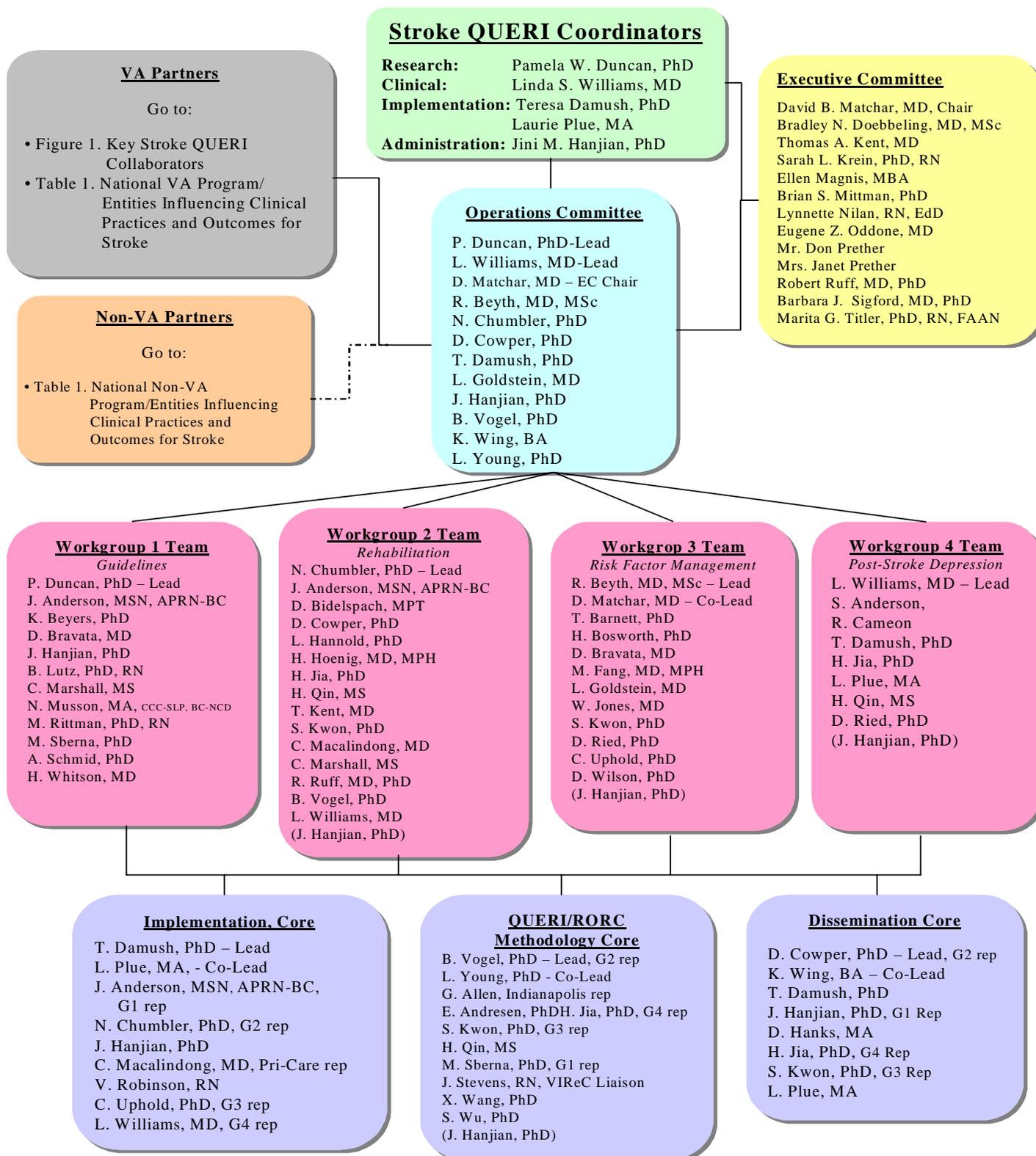
The **Core Teams** provide support to the current projects and activities, and consult with the investigators as they develop new projects and proposals, prepare articles and presentations and develop other dissemination materials.

- **Dissemination Core.** Leaders: Diane Cowper, Ph.D., and Kristen Warr-Wing, B.A. The Dissemination Core works from an approach to dissemination that is defined as the targeted distribution of information and intervention material to a specific public health or clinical practice audience. The Core’s intent is to spread knowledge and the associated evidence-based interventions associated with Stroke QUERI projects and research. In FY 2007, the dissemination strategy is to build upon our previous successes, continuing to use existing technology and communication channels within the VA to disseminate information to a large audience at little or no cost (for instance, in FY 2006, two “Hey-VA” emails and two Earning and Leave messages on stroke risk factors were sent to approximately 200,000 VA employees, many who are veterans). The Dissemination Core, and Ms. Warr-Wing, the QUERI Dissemination Coordinator and Webmaster, consult with investigators during the development of the proposals to assure that all aspects of dissemination are addressed. In addition, the Core oversees and develops other dissemination activities and products such as posters, newsletters, brochures and other

dissemination avenues to get the message out about the stroke prevention and the Stroke QUERI to veterans, their families and VA employees. The Core also oversees all dissemination activities to assure that VA dissemination procedures are followed.

- **Implementation Core.** Leader: Teresa M. Damush, Ph.D. The Implementation Core assists and leads in the development of implementation science and approaches used in the Stroke QUERI projects. This Core provides support to the Workgroups and investigators during the development of projects and proposals, and throughout the execution of implementation projects and activities, including supporting publication and dissemination efforts. This may include writing the implementation research methodology sections, and consulting on the use of implementation models, methodologies and approaches. Dr. Damush, Ms. Plue, and Dr. Hanjian serve as co-investigators and consultants on a number of Stroke QUERI implementation projects and provide methodological support as required. In 2006 we added Dr. Maria Titler to our Executive Committee to assist in guiding our implementation strategies.
- **Methodology Core.** Leaders: Bruce Vogel, Ph.D., and Linda Young, Ph.D. The primary purpose of the Methodology Core is to provide statistical support to the Workgroups and Stroke QUERI investigators. Each project, in need of statistical consultation and support, is assigned appropriate Core personnel (M.A. and Ph.D. level statisticians) who work on the project as members of the study team from project inception through completion. In addition, papers and presentation to be submitted for publication, and final reports to be submitted to VA Research Services are reviewed by a Ph.D. level statistician to ensure that the methods are appropriate and of the highest quality.
  - The Methodology Core is leading an effort to keep up-to-date the estimate of the incidence and prevalence of stroke for veterans within the VA. To fully understand the burden of stroke on VA resources, it is important to get an accurate assessment of stroke incidence and prevalence as well as the prevalence of high-risk factors for stroke among VA enrollees. Efforts are focused on the available administrative data bases and algorithms that have been developed for high sensitivity and high specificity. A variety of methods are being used to obtain estimates. In addition, the BRFSS will be used with the administrative data bases to obtain additional estimates. Once all estimates are compiled, stroke experts will review the meaning of the various approaches and come to consensus on the best measures to report.

**Figure 6. Stroke QUERI Table of Organization**



**Table 7. Stroke QUERI Staff and Executive Committee Roster**

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