

Stroke QUERI

2004 QUERI Annual Report and Strategic Plan

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Research Coordinator:

Pamela W. Duncan, PhD, FAPTA
Rehabilitation Outcome Research Center
1601 SW Archer Road
Gainesville, FL 32608-1197
Phone: (352)376-1611 Ext. 6843
Fax: (352)271-4540
Email: pwduncan@phhp.ufl.edu

Clinical Coordinator:

Linda S. Williams, MD
Roudebush VAMC HSR&D
1481 West 10th Street
Indianapolis, IN 46202
Phone: (317)554-0000 Ext. 2887
Fax: (317)554-0114
Email: lwilliams@HSRD.va.iupiu.edu

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Executive Summary

Stroke is one of the leading causes of disability in the United States and the third largest cause of death. Stroke has a substantial impact on the physical and psychological well-being of both veterans and their families. The Veterans Health Administration (VHA) of the Department of Veterans Affairs (VA) estimates that 15,000 veterans are hospitalized for stroke each year, with a new stroke costing an estimated \$111 million for acute inpatient care, \$75 million for post acute inpatient care, and \$88 million for follow-up care over 6 months post-stroke [1]. Based on American Heart Association (AHA) stroke incidence and prevalence figures, up to 75,000 veterans may be stroke survivors [2]. Effective secondary prevention and rehabilitation interventions initiated early following stroke may reduce the risk of a second stroke, can enhance the recovery process and minimize functional disability. Improved functional outcomes for patients improve quality of life as well as reduce long-term care expenditures.

The mission of the stroke QUERI is to reduce stroke risk and maximize the functional status and quality of life of veterans with stroke by systematically implementing clinical research findings and evidence-based guidelines into routine clinical practice.

Given our current level of evidence and status of post-acute stroke practice within the VA system, we have chosen to focus on the following four primary goals and related objectives:

Goal 1: To improve overall compliance with the Department of Veteran Affairs and the Department of Defense (VA/DoD) clinical practice guidelines for the management of stroke rehabilitation.

Objective 1: Identify baseline levels of VA clinical stroke guideline compliance using an existing RR&D funded project.

Objective 2: Collaborate with the VHA Employee Education Service (EES) program to promote implementation of evidence-based stroke guidelines.

Objective 3: Develop a service directed project or IIR (Investigator Initiated Research) to evaluate compliance with the newly created post stroke rehabilitation guideline following

the nationwide EES education program. Compare guideline compliance pre-post EES program in select sites of care to determine the effectiveness of the education program.

Objective 4: Based on the evaluation of the effectiveness of the EES program, modify future programming and processes to enhance implementation of the guidelines.

Goal 2: To ensure that a plan for rehabilitation is considered for all stroke patients.

Objective 1: Develop and validate methods for establishing the numerator (patients who received or were offered rehabilitation services) and the denominator (patients with stroke).

Objective 2: Estimate the proportion of stroke patients that receive stroke rehabilitation services across VISNs (Veterans Integrated Service Network).

Objective 3: Collaborate with VA Central Office (VACO) Physical Medicine and Rehabilitation Services (PM&RS) and VACO Office of Quality and Performance (OQP) to evaluate the feasibility of creating performance indicators, report card feedback, or performance measures using methods and measures developed in this QUERI initiative.

Goal 3: To reduce the risk of stroke recurrence by assuring appropriate anticoagulation of stroke patients with atrial fibrillation.

Objective 1: Define existing practice patterns in the VA and variations from best practices.

Objective 2: Identify patient characteristics that predict performance re: Objective 1 and that could form the foundation for implementation.

Objective 3: Identify site characteristics that predict performance re: Objective 1 and that could form the foundation for implementation.

Goal 4: To reduce the physical, emotional, and social burden of depression after stroke.

Objective 1: Define the existing practice patterns in the detection of depression in veterans with stroke.

Objective 2: Examine variation and impact of evidence-based treatment of depression in veterans with stroke.

Objective 3: Improve the implementation of best evidence for the detection and treatment of post-stroke depression.

The Stroke QUERI faces two major challenges in accomplishing its mission. First, the guidelines cannot be effectively implemented without considering the continuum of care and the multiple providers for stroke patients. Second, much work is needed to identify effective approaches to promote and sustain adoption of stroke evidence based guidelines. The goals of the QUERI will only be realized if we partner with VA clinical services and experts in implementation. In this strategic plan we have established collaborations with VISN clinical performance workgroups, Physical Medicine and Rehabilitation Service, Employee Education Service, Office of Quality Performance, and the Community Care Coordination Service (CCCS) in VISN 8. We have also formed a Translation Implementation and Evaluation Core (TIEC) as part of our organizational structure.

To meet our goals, we have a strong Operations Committee and a strong team of affiliated investigators from different VHA sites (Gainesville, Indianapolis, Durham, Kansas City, and New Haven). These investigators have a number of related ongoing and pending researcher initiated projects that will support our QUERI objectives as well as offer opportunities to develop new QUERI related proposals. We will take advantage of the infrastructure of the already funded VA Rehabilitation Outcomes Research Center (RORC) (Appendix A), the VA Information Management for Patient-Centered Treatment (IMPACT) in Indianapolis (Appendix B), and the recently proposed Roudebush VA Center of Excellence on Implementing Evidence-Based Practice (CEIBP) (Appendix C).

Goal 1: Improve overall compliance with the VA/DoD clinical practice guideline for the management of stroke rehabilitation

Step 1: Select Diseases/Conditions/Patient Population.

Forty percent of stroke patients are left with moderate functional impairments and 15% to 30% with severe disability.[3] Effective rehabilitation interventions should be initiated once the patients' acute situation is stabilized and may need to be continued during the continuum of post-acute care. This will enhance the stroke recovery process and minimize functional disability. Improved functional outcomes for patients contribute to patient satisfaction, as well as reduce potential costly long-term care expenditures. The VA estimates that 15,000 veterans are hospitalized for stroke each year.[2]

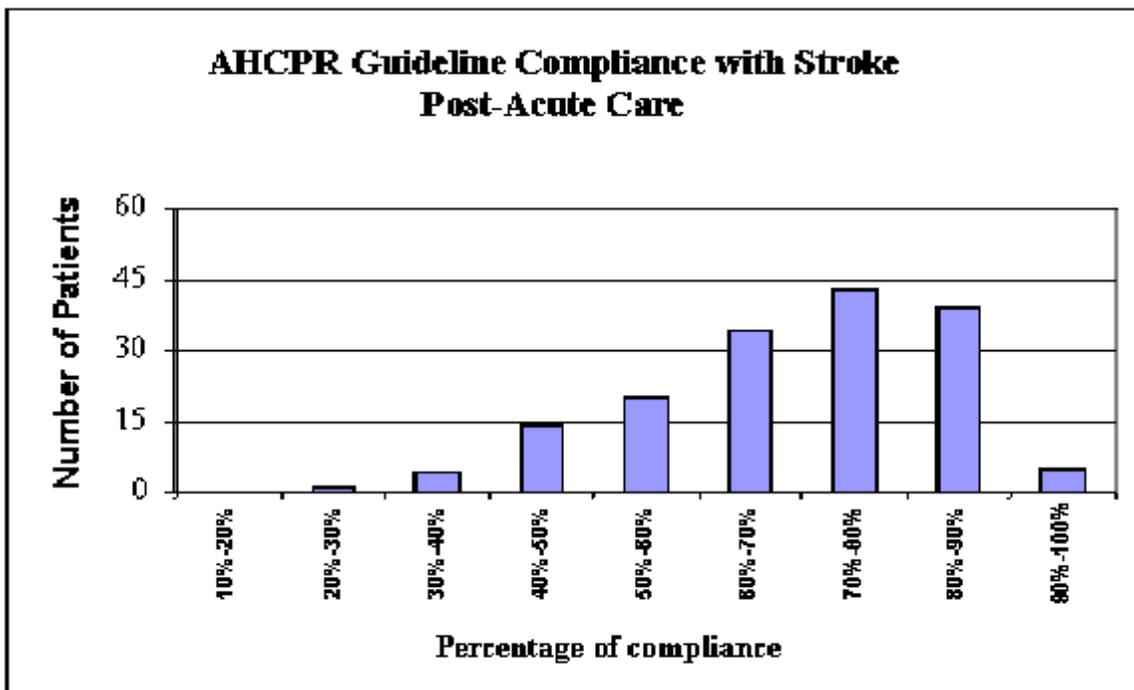
Step 2: Identify Evidence-Based Guidelines/Recommendations.

In April 2003, the VA/DoD released new guidelines for the management of post-acute stroke and stroke rehabilitation.[4] The guidelines were developed to assist facilities to implement processes of care that are evidence-based and designed to achieve maximum functionality and independence, and improve patient/family quality of life. These guidelines were developed using evidence-based methodology that integrated the best evidence with clinical expertise. There were 13 recommendations with the highest evidence. At this time, the VHA National Clinical Practice Guidelines Council (NCPGC) has given the guidelines the highest level of endorsement for implementation system-wide. The VHA EES will roll out a system-wide education program directed at guideline implementation in February 2004.

The most important goal of the VA/DoD Clinical Practice Guideline for the Management of Stroke Rehabilitation is to provide a scientific evidence-base for practice interventions and evaluations. Implementation of the guidelines should provide facilities a structured approach to post-stroke care and assure that veterans who suffer a stroke will have access to comparable care, regardless of geographic location. The guidelines will serve as a guide that clinicians can use to determine best interventions and timing of care for their patients, better stratify stroke patients, reduce readmission, and optimize healthcare utilization. If followed, the guideline is expected to have impact on multiple measurable patient outcome domains.

Step 3: Measure and diagnose quality/performance gaps.

In a 2002 study by Duncan, VHA stroke care in 11 VAMC sites was studied for compliance with a post acute stroke guideline published by the Agency for Healthcare Research and Quality (AHRQ, formerly AHCPR).[5] Using a formalized methodology for chart abstraction and dimension weighting, [6] composite compliance scores were calculated for individual patients receiving inpatient rehabilitation in a variety of care settings (acute inpatient rehabilitation, subacute inpatient rehabilitation, skilled nursing facility, extended care, etc.). The average compliance score was 70% for 159 subjects (median 73%) with a wide range from the 20th percentile to the 90th percentile. The graph below illustrates the distribution of patients across their composite compliance score.



Compliance rates varied as well across sites of care (site mean range 56% to 76%) and intensity of care settings (72% rehabilitation facilities, 62% nursing homes). The study also investigated whether guideline compliance was related to patient outcomes. After case mix adjustment, level of compliance with post-acute rehabilitation guidelines was significantly associated with patient functional recovery as measured by the Functional Independence motor

score, Lawton IADL, and Stroke Impact Aggregate Physical Domain score. The intensity of the effect of post-acute guideline compliance is both statistically significant and clinically meaningful. For example, by increasing guideline compliance from 50% to 100% the effect on FIM motor function is approximately 12 points and on Lawton IADL score approximately 4 points. Similar to the effects noted on six-month outcomes, compliance with guidelines improved patient satisfaction. [7]

Average compliance scores varied across different sites of care. Average post-acute compliance for individuals who received care in high level post-acute care was 72.7% compared to 63.4% for patients who received care in low-level sites (nursing homes) ($p < .005$). We also analyzed the relationship between specific aspects of structure of care and process of care using summary scores for systemic organization, staffing characteristics, and technological sophistication. These summary scores were positively associated with post-stroke guideline compliance in univariate and multivariate models. [8]

Building on the previous results, we now have a recently funded 2-year VA RR&D project (Reker, Duncan) that began in July 2003. This study is exploring the relationship between the new VA/DoD guidelines and functional status gain during rehabilitation stay in two types of settings (acute and subacute). Guideline compliance is being measured in 50 acute and subacute VHA rehabilitation sites of care over the period July 1, 2002 through June 30, 2003. This study will review medical records of approximately 800 patients. As such, the study will be powered to examine the individual dimensions of the guideline as well as calculating composite compliance scores for individual patients. Outcome measures include motor gains (FIM points) during rehabilitation and discharge to community. Organizational structural components identified by Hoenig et al [8] that were found to be associated with guideline compliance will be collected by survey and studied in greater detail to assess for effects on specific dimensions of compliance.

This existing study will serve as baseline documentation (Goal 1: Objective 1) for post-acute guideline compliance identifying variation across multiple VA sites of care in two settings of care.

Step 4: Implement improvement programs.

Much work is needed to identify effective approaches to promote and sustain adoption of stroke rehabilitation evidence-based guidelines. The challenges exist at multiple levels: at the organizational, provider, and patient level. The success of the Stroke QUERI however, will only be realized if we can partner with VA clinical services and managers, as well as experts in implementation to ensure successful implementation of the guidelines. In order to successfully implement the guidelines into routine clinical practice, the guideline-specific barriers need to be assessed, including organizational factors such as leadership support for and local modification of the guidelines, and individual patient and provider factors. As patients often do not comply with treatment regimens, it is important to evaluate patient attitudes, their understanding of the provider's recommendations, as well as their individual preferences. Identifying specific translational interventions that reduce the guideline-specific barriers normally involve formative evaluation of the patients', providers' and administrators' perspectives (attitudes, acceptance, support, etc.) on the guidelines.

Following the adoption of the VA/DoD stroke guideline by the VHA National Clinical Practices Guidelines Council, the VA EES, in collaboration with the OQP, and Patient Care Services, began developing a continuing education module for VHA Patient Care Services. The module is designed as an independent, web-based program of study with two goals: 1) to provide the learner with knowledge of the VA/DoD Clinical Practice Guideline (CPG) for the Management of Stroke; and 2) to use case vignettes to provide opportunities for learners to apply the guideline to emphasize how best to use evidence to provide care for the patient who needs stroke rehabilitation.

The program is accredited for continuing education units, and will be implemented in March 2004. The targeted audience is defined as the multi-disciplinary team including physicians, nurses, pharmacists, physical therapists, psychologists, occupational therapists, speech-language pathologists, social workers, recreation therapists, kinesiotherapists, physician assistants, dieticians, and nurse practitioners. The specific outcome objectives of the training are to enable the participants to:

- Utilize the Stroke Rehabilitation Clinical Practice Guideline;
- Define basic terms;
- Explain the basic concepts of stroke rehabilitation;
- Demonstrate use of appropriate tools;
- Analyze patient situations for appropriate care;
- Identify common symptoms in the post-stroke patient (depression, anxiety, aspiration, aphasia, motor-speech disorders, cognitive disorders, etc);
- Recognize and prevent potential complications following stroke.

QUERI investigators will collaborate with Donna Schoonover at EES to monitor the progress of the education intervention for facility level completion rates in order to estimate intervention saturation (Goal 1: Objective 2). These estimates will provide: 1) a proxy indicator of early adopters as a potential determinant for guideline compliance, and 2) comparative data on uptake for future site selection in order to evaluate the impact of the module in future QUERI efforts.

Steps 5/6: Evaluate improvement programs.

In order to evaluate the education intervention, we aim to develop a service directed project or IIR to examine institutional-level compliance with the newly created post stroke rehabilitation guideline following the nationwide EES education program. We will compare the results to pre-education compliance in select sites of care to determine the effect of the educational program.

Following the VHA-wide rollout of the education module for the new VHA stroke guideline, 20 sites with pre-guideline compliance data and education saturation estimates will be selected for post guideline evaluation. The sites will be selected randomly, stratified evenly between acute bedservice rehabilitation sites and subacute rehabilitation sites. Patients will be selected using a high sensitivity stroke ICD-9 algorithm, in addition to selecting patients entered into the Functional Status Outcomes Database (FSOD). All stroke patients in selected sites receiving care over a six-month period beginning three months after the completion of the

education effort will be studied. Charts will be reviewed using the established AHRQ guideline methodology with the added VHA specific guideline components. Ten additional VHA sites of care without specialized bedservice rehabilitation units (and not included in the existing RR&D study) will be selected for study to determine guideline compliance in sites with less formalized rehabilitation structures. In addition to assessing the education program's influence on compliance, we will also evaluate the impact of compliance on patient outcomes. Outcome measurements will include functional gain (FIM motor scores), community placement, utilization of services in units and dollars, and mortality. This study will provide: 1) a system-wide estimate for VHA guideline compliance, 2) a measure of the effectiveness of the guideline educational component, 3) potential structural and process determinants for successful guideline implementation and training, and 4) additional empirical evidence for the relationships of structure, process, and patient outcomes in VHA stroke care.

A critical part of our QUERI group translational research plan is to evaluate the effectiveness of the education intervention. We are aware that previous studies have demonstrated educational programs alone are not highly successful. Therefore, we will assess the factors that may influence uptake of the guidelines. After the assessments, investigators will formulate recommendations for wider implementation. We will utilize our clinical and management connections in VISNs 8 and 11 as a platform to disseminate findings locally and regionally. We plan to work closely with VISN and VACO leadership to effectively inform and sustain these efforts.

Table 1. Summary Table: Objectives, Actions, Products, QUERI Category, SPO Framework, and Evaluation

Goal 1. To improve overall compliance with the VA/DoD clinical practice guidelines for the management of stroke rehabilitation

Objective 1: Identify baseline levels of VA clinical stroke guideline compliance using an existing RR&D funded project.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Use existing chart review study for guideline compliance in 50 VA sites	Qtr 1 Year 2	Patient sample	Variation studies to measure current practices related to deviations from best practices (Category 3a)	Baseline process of care measured in 50 VAMC sites.	The action items will be accomplished by using data from an existing study; a list of potential determinants for guideline compliance will be compiled. The objective will be accomplished through our ability to document the overall compliance rates by facility to the VA/DoD clinical practice guidelines.
Action 2: Analyze potential determinants for guideline compliance	Qtr 2 Year 2	Site variation in structure of care documented using existing study site survey	Variation studies to explain/model current practices; to identify determinants of (influences on) current practices and determinants of variations from best practices (Category 3b)	Structure of care measured in 50 sites- existing study	

Objective 2. Collaborate with the national VA education (EES) program to promote dissemination of evidence-based stroke guidelines.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Work with Employee Education System in the testing and follow-up of their web based education module aimed at guideline compliance	Qtr 1 Year 1	Education module for system-wide dissemination	Category 4c- education module scheduled to be rolled out VHA system-wide in March 2003.	Process of care instructions that are standardized and distributed VHA system-wide.	Our objective will be met with the successful adoption and implementation of an education module located on the EES Web site to educate VA personnel nationwide on stroke guidelines. Continuing Education Units (CEUs) for clinicians completing the education module.

Objective 3. Develop a service directed project or IIR to evaluate compliance with the newly created post stroke rehabilitation guideline following the nationwide education (EES) program. Compare guideline compliance pre-post EES program in select sites of care to determine effectiveness of the education program.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Prepare and submit SDR or IIR to achieve objective	Qtr 3 Year 1	SDP/IIR submitted for funding	Phase 3 and 5 assessing gap and evaluate education programs	Assessing process of care	To meet the objective and each action step: The IIR/SDP will be funded,
Action 2: Select sites, obtain approvals, review records	Qtr 2 Year 2	Sample of sites and patients	Category 4f	Process of care-compliance with stroke guideline	The project will be conducted and completed in a timely fashion A series of SPO relationships will be identified and
Action 2: Compare compliance rates following education effort to pre-education levels of stroke guideline compliance	Qtr 4 Year 2	Evaluate improvement in stroke guideline compliance. Pre and post education stroke rehabilitation guideline compliance rates and evaluation for effects on patient outcomes.	Category 5	Process of care-compliance with stroke guideline	Recommendations to increase guideline compliance will be compiled and submitted to decision-makers.
Action 3: Reanalyze facility level structures and process of care to evaluate potential determinants of improved guideline compliance.	Qtr 4 Year 2	Evaluate determinants for guideline compliance improvement; Evaluate the structural components that are associated with higher guideline compliance rates and improvements in compliance rates.	Category 4f	Structure of care effects on processes of care	Long-term evidence that the objective was met is that the Stroke QUERI's SPO recommendations are adopted and patient outcomes are improved.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 4: Evaluate the relationship of guideline compliance and patient outcomes.	Qtr 4 Year 2	Documentation of patient outcome improvement Evaluate the structure-process-outcome relationships with increased guideline compliance.	Category 5	System wide improvement estimates (outcomes)	

Objective 4: Based on the evaluation of the effectiveness of the EES program, modify future programming and processes to enhance implementation of the guidelines

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Develop specific recommendation for VISN and VACO Clinical and Management leadership regarding refining approaches to patient and provider education.	Qtr 2 Year 3	White paper outlining recommendations; Discussion group at VA National QUERI, Ambulatory Care meetings on implementing.	Category 5/6	Education/training processes for implementation	Follow-up survey of Clinical and Quality Managers, sample of sites to assess uptake 3 and 6 months later.
Action 2: Present and Publish specific recommendations for training	Qtr 3 Year 3	Peer-reviewed manuscripts in clinical, management, and QI/health services literatures	Category 5/6	Structure, Process	Publications in relevant peer-reviewed literature and presentations for VACO, VISN, Leadership Conferences

Goal 2: To ensure that a plan for rehabilitation is considered for all stroke patients

Step 1: Select Diseases/Conditions/Patient Population.

Forty percent of stroke patients are left with moderate functional impairment and 15% to 30% with severe disability.[2] Rehabilitation is the main modality for recovery after stroke. Effective rehabilitation interventions initiated early following stroke can enhance the recovery process and minimize functional disability.[4] The primary goal of rehabilitation is to prevent complications, minimize impairments, and maximize function (Joint Commission on Accreditation of Healthcare Organizations).

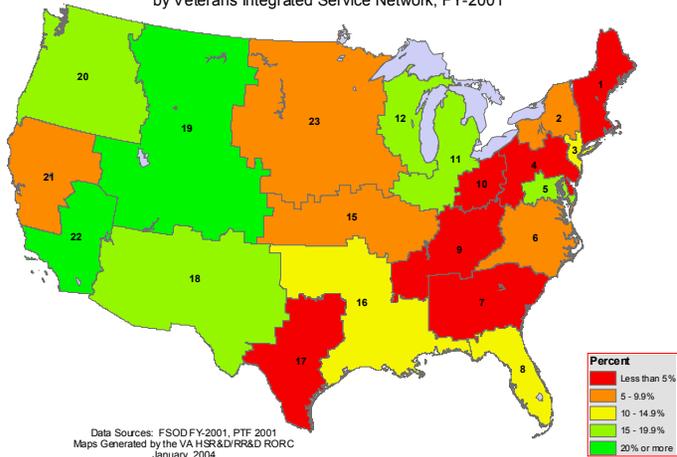
Step 2: Identify Evidence-Based Guidelines/Recommendations.

Patients who have sustained an acute stroke should receive rehabilitation services if their post-stroke functional status is below their pre-stroke status, and if there is a potential for improvement. If pre- and post-stroke functional status is equivalent, or if the prognosis is judged to be poor, rehabilitation services may not be appropriate for the patient. Patients who have had an ischemic or hemorrhagic stroke with resulting impairments and limitations in activities, as identified on the brief assessment, should be referred to rehabilitation services for an assessment of rehabilitation needs. The VA guidelines strongly recommend that once the patient is medically stable, the primary physician consult rehabilitation services (i.e., physical therapy, occupational therapy, speech and language pathology, kinesiotherapy, and physical medicine), as indicated, to assess the patient's rehabilitation needs and to recommend the most appropriate setting to meet those needs. A multidisciplinary assessment, using a standard procedure, should be undertaken and documented for all patients. Patients with need of rehabilitation intervention should be referred to a specialist stroke rehabilitation team, as soon as possible.[4, 9] It is the intent of this goal to quantify the proportion of stroke patients that receive rehabilitation services and to determine the variation of those services across sites and settings of care (inpatient vs. outpatient).

Step 3: Measure and diagnose quality/performance gaps.

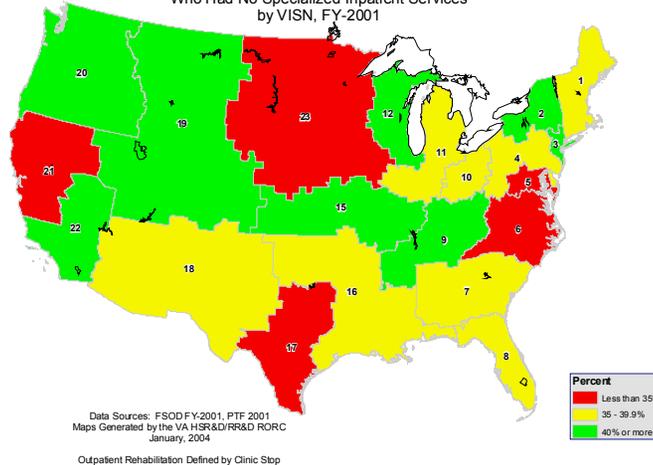
There exists a great geographic variation in specialized rehabilitation care received by VHA stroke patients. According to Cowper et al, [10] in VISN 9 no patients received coordinated inpatient rehabilitation care, while in VISN 22, 27% of the patients had this type of inpatient service. Further, within VISN 22, among those patients who received specialized rehabilitation during inpatient care, 85% of them continued this type of treatment in an outpatient setting during the follow-up period, and among those who did not receive specialized rehabilitation during inpatient care, 46% of them received the treatment in an ambulatory care setting during the follow-up period. On the other end of the spectrum, in VISN 12, 22% of the patients who had inpatient specialized rehabilitation care continued this type of treatment at outpatient during the follow-up period, and 32% of those who did not have inpatient rehabilitation treatment had the treatment in an outpatient setting. The following three maps depict the percentage of stroke patients receiving specialized inpatient and outpatient rehabilitation services, respectively.

Map 1: Percent of Patients Receiving Specialized Inpatient Rehabilitation Services by Veterans Integrated Service Network, FY-2001



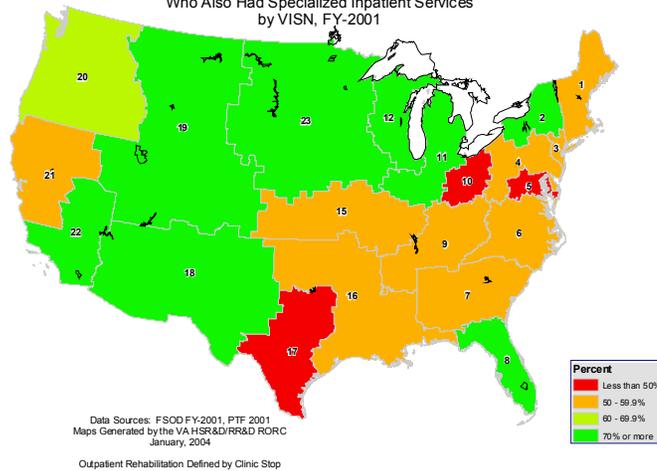
Specialized Inpatient Rehabilitation Services defined as Care Class 4 (Acute) or Care Class 9 (Sub-Acute) in FSOD

Map 2: Percent of Patients Receiving Outpatient Rehabilitation Services Who Had No Specialized Inpatient Services by VISN, FY-2001



Outpatient Rehabilitation Defined by Clinic Stop

Map 3: Percent of Patients Receiving Outpatient Rehabilitation Services Who Also Had Specialized Inpatient Services by VISN, FY-2001



Outpatient Rehabilitation Defined by Clinic Stop

Given the variation in post-stroke care, the Stroke QUERI faces a major challenge in implementing the evidence-based guidelines. The guidelines can not be affectively implemented without considering the variations in access to rehabilitation care for stroke patients. VISNs 8 and 11 are located in the midrange of VISNs nationally across these measures, demonstrating considerable room for improvement.

The Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) and the American Stroke Association are establishing performance measures for stroke care. One of the performance measures requires that “a plan for rehabilitation was considered for stroke patients.”

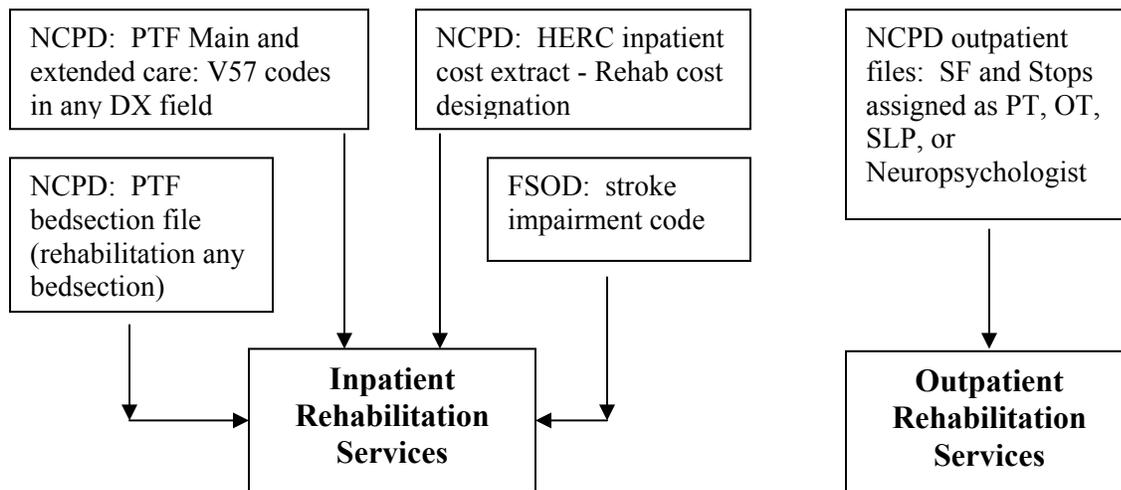
To estimate the variation in access to rehabilitation services, it is necessary to identify a valid numerator (patients receiving services) and a valid denominator (patients with stroke). An objective of the Stroke QUERI is to develop and validate the methods to establish the numerator and denominator.

We will use two methods to establish the denominator (patients with stroke). Using ICD-9 diagnosis codes in administrative data to identify patients with stroke is a challenging process. However, a high sensitivity ICD-9 algorithm has been developed within the VHA (Reker-who’s counting what) and is currently being used by the OQP in one of their VHA quarterly performance measures. This ICD-9 algorithm will be used as one source to identify a one-year cohort of stroke patients.

The other source to identify valid stroke patients is a clinical database developed within Physical Medicine and Rehabilitation Services (PM&RS) and stored at the Austin Automation Center. The database is named the Functional Status Outcomes Database (FSOD) and is connected to all VHA sites and CPRS for direct or indirect data entry. The utility of the FSOD is derived from a VHA directive (VHA Directive 2000-016) published June 5, 2000 that mandates the entry and evaluation of all stroke patients with any rehabilitation potential. That is, any VHA stroke patient that may have rehabilitation needs, must be evaluated with a Functional Independence Measure (FIM) and this clinical evaluation must be entered into the FSOD. Patients identified and evaluated by clinicians within the FSOD to have a stroke will be added to the ICD-9 algorithm cohort to complete the denominator of stroke patients for the study year.

The numerator to establish the proportion of patients receiving rehabilitation services will be derived from multiple sources. Evidence for rehabilitation care will be categorized into 4 classes of rehabilitation services: 1) patients with no evidence of any rehabilitation services, 2) patients with evidence of outpatient rehabilitation services, 3) patients with evidence for inpatient rehabilitation services only, and 4) patients with evidence for inpatient and outpatient rehabilitation services. Patients who expire while in the hospital will be classified separately. Each class of care will be established with data and criteria from several sources.

At the highest level of care (4), evidence for inpatient and outpatient care must be documented. Outpatient care will be identified by searching the outpatient files of the National Patient Care Database at the AAC. Searches of the SF outpatient files will target services provided by Occupational Therapists, Physical Therapists, Kinesiotherapists, and Speech-Language Pathologists. Any services provided by these disciplines will be counted as outpatient rehabilitation services. All outpatient services will be documented using this methodology consistently across all classes of care. Evidence for inpatient rehabilitation services will be documented by searching the NPCD inpatient files (main, extended care, and bedsection) for a V57.xx (rehabilitation) ICD-9 diagnosis code in any primary or secondary diagnostic field or the presence of “rehabilitation” in any bedsection field. Additional evidence for inpatient care will be sought using the Health Economic Resource Center (HERC) cost files because these files use information from the Cost Distribution Reporting system (CDR) to allocate costs into a “Rehabilitation” category. Data from the CDR are not available nationally from any other convenient source. The HERC cost files will only be used if they provide unique evidence for inpatient care that is not available in the NPCD. The final source of evidence for inpatient rehabilitation services will be the FSOD. The FSOD provides documentation for patients receiving the highest level of inpatient rehabilitation care through their careclass variable identifying “acute rehabilitation bedservice care” and “subacute rehabilitation bedservice care.” These inpatient and outpatient sources and criteria will be used to assign all stroke patients in the annual cohort into one of the four classes of rehabilitation services received. In-hospital deaths will be identified from the DoD NPCD variable. The following schematic illustrates the data sources used to define the rehabilitation numerator assignments.



Variation of the rehabilitation proportions across facilities and VISNs will be analyzed and documented to characterize “normal” distributions across the continuum of services and identify potential outliers that may differ systematically from the group as a whole. Facility level variables obtained from Dr. Doebbeling’s QUERI IIR “Determinants of Clinical Guideline Implementation Effectiveness” CPI-99-126, CPI -01-141 (quality improvement processes, guideline implementation approaches, culture, other organizational factors) as well as more commonly used facility characteristics (beds, volume, specialized services such as GEM or rehabilitation units) will be explored as potential determinants of care class distribution.

Variation of care class will be documented in the following table:

Proportions of Stroke Patients by care class and VISN

VISN	Inpatient & Outpatient	Inpatient Only	Outpatient Only	None
1	X%	X%	X%	X%
2	X%	X%	X%	X%
3	X%	X%	X%	X%
4	X%	X%	X%	X%
.....				
23	X%	X%	X%	X%

Step 4: Implement improvement programs.

Since the JCAHO and the American Stroke Association uses the provision of rehabilitation services to stroke patients as a performance measure, we will explore similar avenues within VACO toward the development of a similar measure. We will share all stroke QUERI methods, data, and analyses in this goal with the VACO PM&RS department and VACO Office of Quality and Performance (OQP) for their evaluation, feedback, and suggested improvements. We will collaborate with VACO PM&RS and OQP in the development of these methods into report card performance indicators.

Steps 5/6: Evaluate improvement programs.

If this measure is adopted by OQP as a performance indicator (report card) or performance measure, we will continue to measure and monitor this indicator on a quarterly basis. We fully expect that this measure, if adopted, will rise steadily as other similar measures have done in the past. Once the methodology for the measure has been firmly established, the Stroke QUERI will pass along whatever information is needed by PM&RS and OQP to continually evaluate the measure. If this measure is not adopted by OQP, we will, at a minimum, calculate this measure on an annual basis as part of the annual ISOD update.

A long-range goal of the Stroke QUERI is to assess if improvement in access to rehabilitation improves patient outcomes. We will specifically emphasize improvements in performance (% stroke patients receiving rehabilitation) over time at the facility level, using time-series analyses. We will be able to use the ISOD to assess if improved access to rehabilitation has affected health care utilization, mortality, and community discharges.

Table 2. Summary Table: Objectives, Actions, Products, QUERI Category, SPO Framework, and Evaluation

Goal 2: To ensure that a plan for rehabilitation is considered for all stroke patients.

Objective 1. Develop and validate methods for establishing the numerator (patients who receive or were offered rehabilitation services) and the denominator (patients with stroke).

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Identify national stroke cohort for FY03	Qtr 1 Year 1	Patient sample	Development of case-finding or screening algorithms and methods for identifying patients (Category 0a)	Denominator for analysis (process)	The objective will be met by: Identifying the National Stroke cohort for FY03
Action 2: Create methods for identifying inpatient and outpatient utilization of rehabilitation services	Qtr 2 Year 1	New methodology for identifying patients receiving rehabilitation services	Category 0a	Methodology established to determine use of rehabilitation services (process)	Establishing validity through the use of FIM-FRGs Establishing continuum of care norms; and Identifying outlier facilities.

Objective 2: Estimate the proportion of stroke patients that receive stroke rehabilitation services across VISNs.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Evaluate rehabilitation services used across sites and settings of care	Qtr 3 Year 1	Site variation documented	Variations studies to measure current practices related to stroke and identification of variations in best practices (Category 3a)	Variation in use of rehabilitation services documents (process)	This objective will be met by creating maps of VISN level performance and sharing with office of PM&RS and VISN leadership.

Objective 3: Collaborate with VACO Physical Medicine and Rehabilitation Services and VACO Office of Quality and Performance to evaluate the feasibility of creating performance indicators, report card feedback, or performance measures using methods developed and measured in this QUERI initiative.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Work with VACO, PM&RS and OQP to evaluate, refine, and develop potential performance indicators	Qtr 1 Year 2	Performance measure to insure the provision of rehabilitation services to stroke patients.	Identify and develop programs to promote best practices (Category 4).	Improved patient outcomes through the provision of appropriate levels of rehabilitation services	<p>This objective will be met with the development of a national level performance measure that is incorporated as part of the Networks' annual performance.</p> <p>The long-term success of this objective will be the improvement of the levels of compliance by VISNs over time, ultimately improving patient outcomes.</p>

Goal 3: Reduce the risk of stroke recurrence by assuring appropriate anticoagulation of stroke patients with atrial fibrillation.

Step 1: Select Diseases/Conditions/Patient Population.

One of the most onerous sequelae of a stroke is a recurrent stroke, and the most common and powerful risk factors for a recurrent stroke is atrial fibrillation. [11, 12] Atrial fibrillation (AF) not only increases the risk of a further disabling stroke by 12-fold, this risk can be effectively reduced using warfarin.[13-17] The prevention of recurrent stroke in this segment of the stroke population at extremely high risk of progressive disability is squarely within the mission of the Stroke QUERI.

Step 2: Identify Evidence-Based Guidelines/Recommendations.

The VA/DoD guidelines recommend that patients with stroke associated with atrial fibrillation be treated with warfarin. The rating of the evidence for this recommendation is good and the grade of the evidence “A” (A strong recommendation that the intervention is always indicated and acceptable). Multiple high-quality randomized trials have indicated that warfarin is the clear treatment of choice for stroke prevention among most patients with atrial fibrillation [13-17] particularly for individuals with prior stroke. If well monitored, anticoagulation with warfarin could prevent over half of the strokes related to atrial fibrillation at the risk of a relatively small number of major bleeding complications.[18, 19] Cost-benefit analyses clearly demonstrate that this is a cost-effective strategy.

Identification and specific treatment of risk factors must be an integral part of any plan for stroke rehabilitation and recovery, and generally extends from around the period of acute hospitalization/initiation of rehabilitation and extends indefinitely. For warfarin treatment, this includes ongoing monitoring of the patient’s international normalized ratio for prothrombin time (INR) with target range carefully controlled within a range of 2.0 to 3.0. cardioembolic patients who have had a large stroke, anticoagulation should not be started for 7 to 10 days due to the risk of cerebral hemorrhage.

Step 3: Measure and diagnose quality/performance gaps.

The two quality/performance concerns are (1) failure to treat appropriate patients, and (2) failure to maintain patient in recommended target range. Despite the results of clinical trials and the recommendations by professional societies [18-20], many patients who could benefit from warfarin therapy do not receive it. [21-23] Matchar and colleagues' analysis of Medicare data revealed that the rate of warfarin use is about 30% (34.8% in whites and 21.1% in African Americans).[23] The quality of warfarin management they receive is often less than optimal.[24, 25] Deviation from target range is a dominant factor in treatment failure, either thromboembolism or hemorrhage.[26-33]

The discrepancy between current and recommended practice results may be attributable to a number of factors, among them the demanding nature of warfarin dosing and monitoring. Due to the complexities of warfarin dosing and monitoring, barriers to appropriate anticoagulation are multifaceted and may include organizational, provider, and patient factors. At this time we do not have a clear picture of the patterns of post-stroke anticoagulation use in VA or the quality of anticoagulation use (as measured by time spent in target range for INR). More generally, we do not know the factors contributing to inadequate treatment or treatment failure.

As a foundation for understanding performance problems and for developing and implementing practical solutions in the VA context, the Stroke QUERI in its initial years will measure and diagnose quality and performance gaps. Specifically we will describe existing practice patterns in VA and variations from best practices for anticoagulation. This will involve acquiring lab results from the DSS National Data Extracts (FY 2004 only) and merging with the ISOD.

Determine the percentage of stroke patients with AF who have anticoagulation started at the time of hospital discharge. For stroke without evidence of bleeding, anticoagulation should typically be initiated prior to hospital discharge. The denominator for this assessment is the number of patients in all VA facilities with administrative codes consistent with acute stroke and AF. The numerator is the subset of the denominator for whom pharmacy

records indicate warfarin therapy beginning immediately at hospital discharge has been dispensed.

Describe quality of anticoagulation. For patients in the numerator of the above assessment, all available INR values for FY 2001 will be acquired from the National VA laboratory records. We will calculate time in target range using the interpolation method of Rosendaal [34]. In addition, we will calculate time in target range adjusted with a loss function based on the relationship between INR and relative risk of thromboembolism and bleeding [35].

Enumerate the number and rates of events, i.e., thromboembolism and bleeding. Major events will be those leading to hospitalization with appropriate ICD-9 codes, based on FSOD FY2001 data. For each patient, period of observation will be time from index hospitalization in FY01 to last in- or out-patient encounter (some time in FY04). Rates will be calculated from number of events divided by number of years of patient observation.

Identify the resource use associated with individuals on anticoagulation. For the same patients, we will use the FSOD FY2001 files to identify resource utilization related to anticoagulation, including bleed or TE related hospitalization, clinic visit, transfusion, bleeding related laboratory tests (CBC, INR, ferritin, iron, TIBC, stool hemocult).

Step 4: Implement improvement programs.

Formative evaluations will be required for Step 4 to identify the patient/provider/site characteristics that are associated with performance. The formative evaluation will be fulfilled by completing three projects linked to ongoing VA efforts. These will serve to provide the deep understanding of the patient and organizational factors associated with appropriate anticoagulation of patients in the VA with stroke and AF required for the development of implementation tools, all without requiring substantial new data collection.

First, we will partner with a specific clinical demonstration project (CoaguCare) currently being executed in Ft. Myers, FL, by the VISN-8 Community Care Coordination Service (CCCS). Through this partnership, we aim to identify patient factors that predict success and failure with a home-based anticoagulation monitoring program. Specifically, the VISN-8 CoaguCare Project is

a care coordination program for veterans with conditions (e.g., atrial fibrillation, stroke prevention, deep vein thrombosis, post-MI) that typically require anticoagulation therapy. The CoaguCare Project was initiated in 2003 and is currently serving 55 veterans. Patients are assigned to one of two treatment arms: (1) in-home messaging device (termed the “Health Buddy”) only, or (2) the “Health Buddy” and an in-home device to monitor INR. The in-home device, the CoaguChek monitor, is a finger stick device that allows the patient to check his or her INR value, and those values are reported to the care coordination through the Health Buddy for monitoring. The veterans in the second treatment arm are tested every two weeks, with laboratory corroboration every two to three months. As part of this program patients are assessed at baseline and six-month intervals on a variety of dimensions including: 1) health related quality of life (SF36V); 2) functional status (impairments in activities of daily living and in instrumental activities of daily living); 2) service use visits (e.g., hospital admissions; bed days of care for hospital admissions; emergency department; nursing home); 3) sociodemographic characteristics (e.g., patient’s age, race, marital status; informal caregiver status, service connected disability status); 4) satisfaction with technology and the project; and 5) patient compliance with monitor. We will also measure the patient’s INR value at baseline and compare that value at six-month and twelve month follow up.

A number of factors may influence the success or failure of patient self-management of anticoagulation therapy. With the leadership of the implementation research coordinator, we will perform a formative evaluation using semi-structured interviews of patients. In these interviews, we aim to determine the facilitators and barriers to patient self-management of anticoagulation therapy in the CoaguCare Project.

Second, we will collaborate with Valerie Robinson, RN, Quality Manager of VISN-6, to perform a face-to-face audit of anticoagulation care practices in facilities within the VISN. This activity will take advantage of and supplement the ongoing audits Ms. Robinson performs. With Dr. Matchar, Ms. Robinson will develop and field an interview instrument designed to collect information about systematic efforts to provide appropriate and high quality anticoagulation care (especially to patients with stroke). The goal is to describe the range of activities, areas of success and of failure. The immediate product will be a written report.

Third, we will collaborate with the ongoing VA Cooperative Studies Program trial, CSP#481, The Home INR Study (THINRS - Appendix D). This study includes a detailed evaluation of patient and caregiver characteristics including cognition, literacy, numeracy, manual dexterity, as well as ability to use a home INR monitoring device and quality of anticoagulation (as assessed by time in target range).

Steps 5/6: Evaluate improvement programs.

The information from the VISN-8 CoaguCare Project, the VISN-6 local audit, and the THINRS trial data will provide the inputs to a project we will submit for Service Directed Project (SDP) funding. This project will aim to develop a tool that allows VA facilities to tailor anticoagulation based on readily measurable characteristics of the system, provider, and patient. This tool will be a key component of an implementation/evaluation project to be performed in later years of the Stroke QUERI.

In the initial years of the Stroke QUERI, we plan to rapidly disseminate information derived from the earlier step projects. These include the importance of the issues, the magnitude of the performance problem, and the approaches that have been used successfully and the pitfalls to avoid.

Table 3. Summary Table: Objectives, Actions, Products, QUERI Category, SPO Framework, and Evaluation

Goal 3: Reduce the risk of stroke recurrence by assuring appropriate anticoagulation of stroke patients with atrial fibrillation.

Objective 1: Define existing practice patterns in VA and variations from best practices for identification.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Determine % of patients with AF who have AC started at/soon after hospitalization (ISOD FY2001)	Qtr 1 Year 1	Through secondary data analysis, the percentage of patients with AF who have AC started at/soon after hospitalization is determined by facility, VISN, national level. Spreadsheet compiled and data added to database.	Empirical studies to evaluate whether use of best practices leads to desired/improved outcomes and performance (Category 2b)	Process of care	Each action step will yield evidence and results. The objective will be met when these activities allow the Stroke QUERI to describe existing practice patterns in VHA and documents variations from best practices for anticoagulation in the form of a written report.
Action 2: Describe how AC is managed (provider types, (ISOD FY2001)	Qtr 2 Year 1	Documentation of AC management in VHA by provider types	Category 2b	Process of care	
Action 3: Quality of AC (time in target range, over time) (ISOD FY2001)	Qtr 3 Year 1	Time in target range calculated using Rosendaal interpolation method for each patient	Category 2b	Process of care	
Action 4: Events (TE, bleed, visits, other resources) (ISOD FY2001)	Qtr 4 Year 1	Documentation of resource utilization related to hospitalization, clinic visit, transfusion, and bleeding related lab tests	Category 2b	Process of care	

Objective 2: Identify patient characteristics that predict performance re: Objective 1 and that could form the foundation for implementation

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Collaborate with CoaguCare Program to evaluate characteristics that predict success or failure in self-management.	Qtr 1 Year 2	Characteristics of patients who succeed (or fail) in self-management are identified.	Empirical studies to evaluate clinical programs/care models (Category 2b)	Process of care	These activities will result in our ability to identify the patient characteristics that predict variation in best practices resulting in a written report.
Action 2: Develop an investigator initiated project or SDR project to develop a patient assessment tool to determining best management strategies for anticoagulation	Qtr 2 Year 2	IIR/SDP project developed	Identify, develop and implement programs to promote best practices (Category 4)	Process of care	In addition to a written report, this objective will be met with the submission of a research proposal to develop and implement a tool to allow VA facilities to tailor anticoagulation based on measurable characteristics of the patient, provider, and system. This tool will ultimately be rolled out broadly in the VA to improve patient outcome.

Objective 3: Identify site characteristics that predict performance re: Objective 1 and that could form the foundation for implementation tools (deep understanding of process in the VA)

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Survey local approaches to AC in post stroke pts with AF (collaboration with VISN 6)	Qtr 3 Year 2	Report: results of approaches to AC	Phase 2 implementation (quality improvement) project (Category 4e)	Process of care	These activities will result in our ability to identify the site characteristics that predict variation in best practices, resulting in a written report.
Action 2: Perform VA survey of AC service availability	Qtr 4 Year 2	Survey complete, report of findings	Variation study to measure current practices related to AC (Category 3a)	Process of care	In addition to a written report, this objective will be met with the submission of a research proposal to develop and implement a tool to allow VA facilities to tailor anticoagulation based on measurable characteristics of the patient, provider, and system. This tool will ultimately be rolled out broadly in the VA to improve patient outcome.

Goal 4: Reduce the physical, emotional, and social burden of depression after stroke.

We plan to achieve this goal by organizing our actions into three broad objectives: 1) defining existing practice patterns in the detection of depression, 2) examine variation and impact of evidence-based treatment of depression in veterans with stroke, and 3) improve the implementation of best evidence for the detection and treatment of post-stroke depression. Within these objectives, we plan specific projects addressing various components of the 6-step QUERI process. In this section, we summarize the action steps related to our overall PSD goal using the QUERI process framework.

Step 1: Select Diseases/Conditions/Patient Population

Post-stroke depression (PSD) is a high volume condition with negative impact on patient recovery after stroke. It occurs in 25% to 40% of ischemic stroke survivors, and is associated with worse functional outcomes, quality of life, and increased post-stroke mortality.[36-40] Although effective treatments for PSD exist[41-44], studies suggest that PSD is often under-diagnosed and undertreated.[45, 46] The association of PSD with worse patient outcomes and the demonstrated variation in depression diagnosis and treatment after stroke suggest that PSD is an important target for quality improvement efforts after stroke. Increasing the detection and treatment of PSD could impact 15% (n=1,650) to 30% (n=3,300) of veterans with stroke annually. It is also feasible to predict, based on literature reports, that the prompt diagnosis and treatment of PSD could produce less health services utilization and savings for both the veteran and the VHA. All patients should be screened for emotional disorders given the high incidence following a stroke.

Step 2: Identify Evidence-Based Guidelines/Recommendations.

Four randomized controlled studies have suggested that treatment with an antidepressant can improve depression symptoms in patients with PSD. [41-44] Although data from large clinical trials in stroke are not yet available, there is no evidence that PSD is significantly different than depression in patients with other chronic medical conditions, and thus no evidence that PSD diagnosis and treatment should differ from best practices for non-stroke related depression. Further, the VHA/DoD, the American Heart Association, and the American

Academy of Neurology have all identified PSD detection and treatment as a quality indicator for best stroke practice.

Step 3: Measure and diagnose quality/performance gaps.

Depression screening is a VA primary care performance measure that is monitored by the Office of Quality Performance (OQP). Although recent VISN-level data show that yearly depression screening is achieved in 83% to 93% of veterans in primary care (target 87%), follow-up for a positive screen occurs in only 51% to 87% (target 85%). Further, follow-up within 6 weeks of a positive screen (a recommended performance measure) occurred in 30% to 68% and follow-up of a new depression diagnosis in only 7% to 39%. Even if screening and follow-up occurs, significant variation in evidence-based treatment has been documented. In a recent study in 14 VHA hospitals in the Northeast, for example, adequate antidepressant dosage was achieved in 90% of patients with a major depression diagnosis but only 45% had adequate duration of treatment, with younger age, black race, and treatment exclusively in primary care associated with inadequate depression care. [47]

Several community-based studies have demonstrated that PSD is underdiagnosed and undertreated, but the patterns of PSD diagnosis and treatment in the VA are largely unknown. We conducted a cross-sectional chart review study of more than 200 veterans with ischemic stroke at the Indianapolis VAMC, and demonstrated that: 1) depression was diagnosed in only 14% of veterans in the first 3 years after stroke, even when outpatient diagnoses and written physician notes were examined, and 2) the likelihood of following American Psychiatric Association guidelines for medication dose differed by type of antidepressant prescribed.[48]

A recent study by RORC investigator, Douglas Ried in VISN 8, showed that PSD is likely undertreated, with 20% of patients prescribed an antidepressant after stroke receiving only a single prescription and dispensing patterns suggesting that many prescriptions were for sleep rather than depression.[49] There are many theoretical reasons why detection and treatment of PSD may be even more challenging than non-stroke-related depression, including physical barriers to follow-up, attribution of depression symptoms to stroke, focus on stroke-specific medical care, fragmentation of care after stroke, and lack of awareness of the depression performance measure by non-primary care providers. In the PSD Clinical Focus, we plan to

investigate these barriers and then design implementation strategies to address them, including exploring the adaptation of the existing primary care depression performance measure to PSD and the use of new technologies and community care platforms to improve best practices in depression treatment and follow-up.

The Stroke QUERI will facilitate the measurement and diagnosis of quality and performance gaps for detecting and managing PSD. Specifically, we will describe existing patterns of PSD detection and treatment and identify deviation from best practices. Key actions related to defining the quality and performance gaps in PSD include:

Determine the proportion of veterans with stroke who are diagnosed and treated for PSD within the first 12 months after stroke. With the input of colleagues from the Mental Health QUERI (see letter from Dr. Kirchner in Appendix G), we will develop a case-finding algorithm for veterans with PSD, using outpatient diagnoses, pharmacy data, and screening results as potential indicators of depression diagnosis. We will pull VISN 8 and 11 data using the high sensitivity stroke diagnosis definition and apply the algorithm to determine the proportion of veterans diagnosed with PSD. We will assess the accuracy of the PSD diagnosis by conducting chart reviews of cases from the Indianapolis and Gainesville VAMCs (RAs supported by QUERI core funds).

Determine which providers are most likely to encounter and thus be in a position to screen post-stroke patients for depression. In order to plan implementation efforts to improve PSD detection and treatment, we need to identify where in the continuum of care we should screen for PSD and what care providers are most likely to encounter patients post-stroke. We will use the ISOD and the data from VISNs 8 and 11 to investigate patterns of follow-up in the first 12 months after stroke. This will allow us to plan our implementation strategies more efficiently and will provide information for tailoring any depression implementation effort based on the veteran's site of follow-up care. For example, veterans following-up in tertiary medical centers may be more likely to be seen by neurologists, Physical Medicine and Rehabilitation providers, and therapists while those receiving care in community-based outpatient clinics may be more likely to receive care from primary-care physicians or nurse practitioners. These differences would have important implications for knowing where and to whom to target

interventions to improve screening and treatment of PSD. VISN 11 post-stroke utilization data will be collected as part of our implementation planning grant (see below). VISN 8 data will be collected as part of Dr. Huanguang Jia's submitted HSR&D proposal to evaluate patterns of follow-up care post stroke. This study will use the VA ISOD, inpatient, and outpatient data as well as Medicare and Medicaid data for all stroke patients (Reker's high sensitivity algorithm) living in Florida.

Determine the treatment patterns for patients diagnosed with PSD. Our objective is to analyze the compliance to evidence-based antidepressant treatment in veterans with stroke. We will utilize Dr. Reid's ongoing project in VISN 8 to assess prescribing patterns, dose, and duration of antidepressant treatment in the immediate post-stroke period. These data will help us identify gaps in evidence-based PSD treatment and plan implementation strategies to address these gaps. We will also analyze this dataset to gauge the impact of PSD treatment on post-stroke utilization. We will also examine data from Dr. Williams' ongoing NIH-funded PSD case-management RCT to compare the determinants and effect of PSD treatment in veterans and non-veterans. This is an example of related ongoing work that QUERI investigators can use to address fundamental questions relevant to the VA that might otherwise go unexamined. Finally, since the ISOD contains pharmacy data and some 90-day follow-up functional status data, we will conduct feasibility analyses to determine whether this dataset can provide additional knowledge about the impact of depression treatment on functional outcome in veterans with stroke.

Step 4: Implement improvement programs.

Led by Dr. Linda Williams, a group of Stroke QUERI investigators from VISNs 8 and 11 recently received funding for a planning grant in response to the RFA for VISN implementation projects. The eventual goal of this project, "Implementing Evidence in the Detection and Treatment of Post-stroke Depression," is to extend the implementation of the existing primary care depression performance measure to improve the screening, diagnosis, and appropriate treatment of PSD. The overall goals of the project are to:

- 1) Identify patient, provider, and system barriers to PSD detection and treatment;
- 2) Develop a multidisciplinary implementation strategy to adapt the existing depression screening measure for systematic PSD screening;
- 3) Plan an implementation project in VISN 8 and 11 evaluating the effect of implementing the existing depression-screening tool on PSD detection and treatment;
- 4) Identify patient, provider, and system characteristics associated with effective implementation of the PSD screening and treatment intervention; and
- 5) Assess the effect of detection and treatment of PSD on functional outcome after.

We will utilize the 6-month planning grant funds to support an analysis of patterns of follow-up in VISN 8 and 11 facilities and to identify a core group of VA managers, researchers and clinicians interested in partnering in the larger project. We will use core QUERI funds in Year 1 to conduct a formative evaluation of provider and patient-perceived barriers to best practices for PSD detection and treatment using provider focus groups and/or individual interviews. We will include input from primary care providers and specialists (neurologists, PM&R) as well as nurses and therapists who frequently encounter post-stroke patients in routine VA care. We will also explore existing technologies and care systems, including the Health Buddy and the cooperative care model, as potential innovative ways to improve the quality of care for PSD.

Steps 5/6: Evaluate improvement programs.

We plan to submit a SDP to implement the PSD intervention developed as the product of our implementation planning grant in VISNs 8 and 11. Our Implementation Planning Grant and core QUERI support in Year 1 will position us to plan this project in VISNs 8 and 11, using the existing depression performance measure as a platform to increase the detection and treatment of PSD. Although the eventual design of the project will be informed by these data, we have developed a preliminary study design framework.

A Translational Research model will inform this project.[50] We will use qualitative data and formative evaluation (some collected as part of our preliminary studies) to design an intervention. The intervention will be based on the existing depression performance measure

which will be tailored, based on our formative evaluation, to be effective specifically for PSD screening and treatment. The intervention will be designed to enhance communication about depression symptoms and screening between the providers who routinely care for veterans after stroke (e.g. primary and specialty care providers, nurses, therapists) within the VA system of post-stroke care (clinics, therapy, and other sites).

We will evaluate the adoption of the intervention by assessing the proportion of veterans screened and treated for PSD. Our hypothesis is that veterans receiving post-stroke care in sites that implement the tailored depression screening performance measure will be more likely to receive depression screening and treatment than veterans at usual care sites. We will implement the tailored depression performance measure at selected VAMCs in VISNs 8 and 11 with other sites serving as controls (3-4 intervention sites and 3-4 control sites). Veterans with ischemic stroke who receive any post-discharge care in the VA in the first six months after stroke will be evaluated. In a 24-month study (12 months enrollment, six of follow-up, six months for lead-in and analysis), we estimate that 480 veterans surviving at least six months post-stroke stroke would be observed (60 ischemic stroke patients per site) and 120-192 should develop PSD. We anticipate that this project will lead to increased screening and treatment of post-stroke depression, and therefore will potentially decrease morbidity and utilization after stroke. This project will also inform the development of strategies for adapting existing primary care performance measures to other sites of care within the VA.

Table 4. Summary Table: Objectives, Actions, Products, QUERI Category, SPO Framework, and Evaluation

Goal 4: Reduce the physical, emotional, and social burden of depression after stroke.

Objective 1: Define existing practice patterns in the detection of depression in veterans with stroke.

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Develop and validate case-finding algorithm to identify veterans with PSD.	Qtr 2 Year 1	Validated PSD identification algorithm. Report re: best strategy for PSD case finding using VA data	0a (Development of algorithm)	Process	Each action under this objective will measure and diagnose quality and performance gaps in depression screening in VHA. This objective will be met when we can accurately identify how many stroke patients are screened for PSD based on existing tools and what the outcome of screening is in these patients. A long-term evaluation to whether the objective has been met is the enhanced detection rate of post stroke depression and the provision of timely treatment for post-stroke depression. This will ultimately improve patients' quality of life.
Action 2: Examine patterns of depression diagnosis and follow-up 1 year after stroke in VISNs 8 and 11.	Qtr 3 Year 1	Summary of patterns and determinants of follow up	3a (Define current practices)	Process	
Action 3. Link VA, Medicare, and Medicaid data to evaluate differences between veterans with and without VA follow-up post-stroke. (HSR&D study under review)	Qtr 1 Year 2	VA/Medicare stroke database for VISN 8 Manuscript about determinants and outcomes of veterans in VA vs. non-VA follow-up post-stroke	0b. (Development of cohort database)	Structure	

Objective 2. Examine variation and impact of evidence-based treatment of depression in veterans with stroke

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Analyze compliance to APA antidepressant guidelines in veterans with stroke (Dose and duration).	Qtr 2 Year 1	Report of antidepressant prescribing patterns	3a (Define current practices)	Process	The action items under this objective will provide the data to determine the impact of evidence-based treatment of depression in veterans with stroke.
Action 2: Examine the impact of treatment of depression on 90-day outcomes (ISOD).	Qtr 3 Year 1	Manuscript	3a (Define current practices)	Outcomes	
Action 3: Compare determinants and effect of antidepressant treatment in veterans and non-veterans (Linda NIH-funded study).	Qtr 4 Year 1	Report	3a (Define current practices)	Outcomes	

Objective 3: Improve the implementation of best evidence for the detection and treatment of post-stroke depression

Action Item	Target Date	Product	QUERI Category	SPO Framework	Evaluation
Action 1: Conduct formative evaluation of provider and patient-perceived barriers to best practices for depression detection and treatment post-stroke.	Qtr 4 Year 1	Data re: provider and patient barriers to best PSD care. Paper re: organizational, provider, and patient barriers to best PSD care.	4d.	Structure	Evidence of meeting the objective is enhanced communication about depression symptoms and screening between providers and veterans with stroke. Key evaluation components will be the successful completion of the planning grant, submission of the implementation project as an SDP or IIR and eventually by the comparison of PSD screening and treatment rates between sites using the PSD screening tool and those who are not using the tool.
Action 2: Conduct VISN 8/11 Planning Grant to identify key collaborators and collect data on patterns of follow-up after stroke.	Qtr 3 Year 1	Report summarizing the focus group and utilization data; development of an SDP or IIR proposal	4e. (Phase 2 implementation project)	Process	
Action 3: Utilize FG data to develop implementation strategy for modifying existing depression performance measure for use in PSD.	Qtr 1 Year 2	PSD implementation tool	4c. (Development of implementation tool)	Process	
Action 4: Develop, pilot and evaluate implementation project.	Qtr 2 Year 2	SDP proposal. Paper re: effect of implementing depression performance measure for PSD detection/treatment.	4c. (Phase 2 implementation project)	Outcomes	

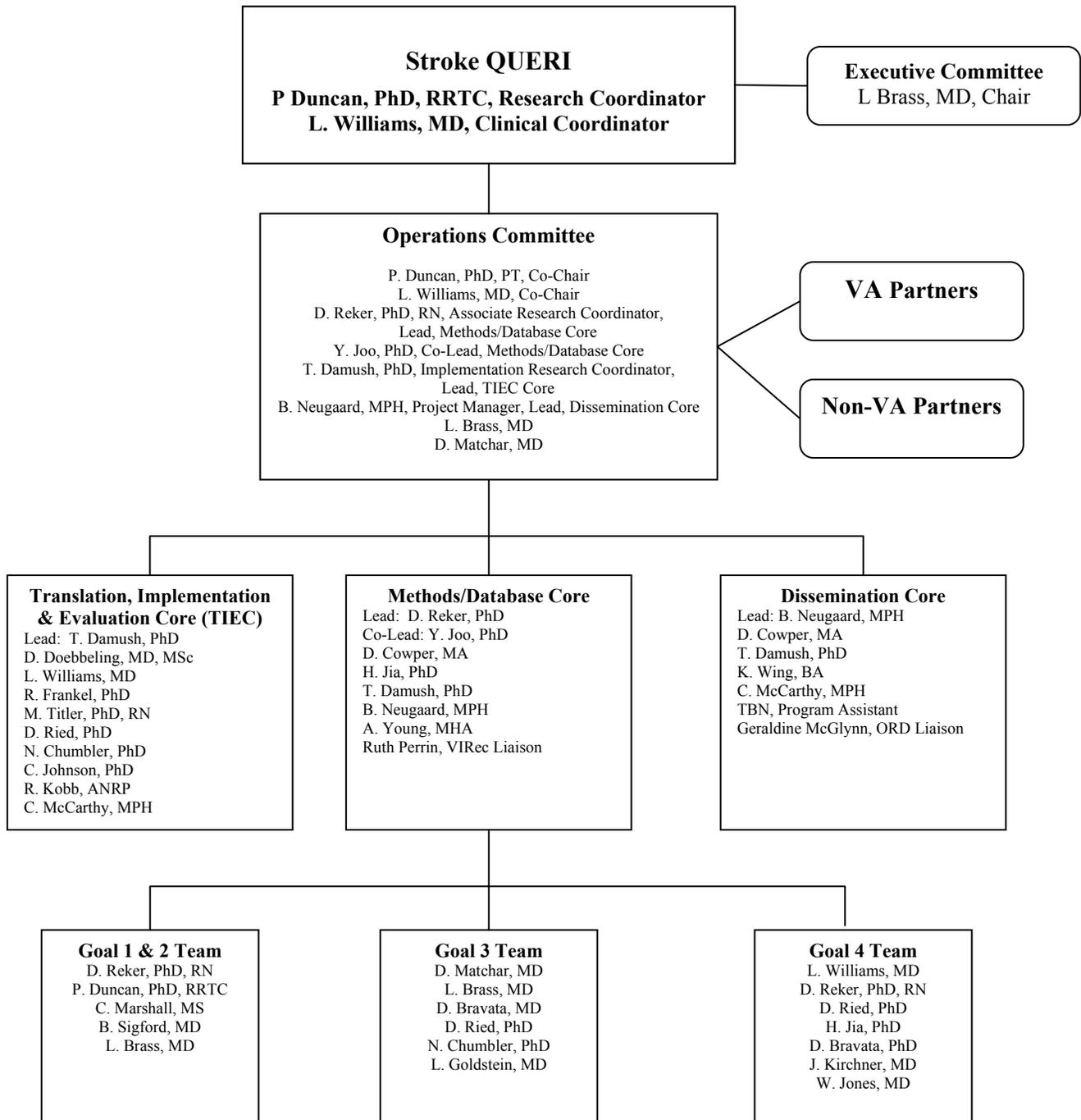
Management Plan

Organizational Narrative

Pamela Duncan, PhD, FAPTA, will serve as the Research Coordinator (RC) and Linda Williams, MD, will serve as the Clinical Coordinator (CC). They will oversee all administrative, research, educational and dissemination activities of the Stroke QUERI. Teresa Damush, PhD, will serve as the Implementation Research Coordinator (IRC) and will be responsible for providing expertise in translation science and serve as a liaison for all Stroke QUERI translation interventions. Britta Neugaard, MPH, will serve as the Project Manager (PM) to the Research Coordinator, Clinical Coordinator, and Implementation Research Coordinator. She will act as the point of contact for the Stroke QUERI group and will coordinate all on-going Stroke QUERI projects.

The Stroke QUERI will be structured as shown in Figure 1 below. The Stroke QUERI will consist of an Executive Committee (TBN), Operations Committee, Translation, Implementation and Evaluation Core (TIEC), Methods/Database Core, Dissemination Core, and three teams to execute 4 goals: 1) VA/DoD global guideline compliance, 2) access to rehabilitation services, 3) secondary prevention, and 4) depression management.

Figure 1: Organizational Chart for Stroke QUERI Center



The **Executive Committee** will include key partners from VA and non-VA programs in stroke rehabilitation. The Executive Committee will advise the Stroke QUERI on all project activities and will be advocates for implementation of programs in the VA. Recommendations for the Executive Committee include Barbara Sigford, Chief of VHA Physical Medicine and Rehabilitation Services; Clifford Marshall, Rehabilitation Planning Specialist; John Booss, Chief of Neurology for VHA; Patricia Ryan, VISN 8 Community Care Coordination Service representative; Ellen Magnis, American Heart Association; and Peter Woodbridge, VISN 11 Director of Telehealth Care and Clinical Executive of Primary Care. We are also recommending that other individuals be considered: George Mensah (CDC- Paul Coverdale Stroke Registry), Steve Finn or Rod Hayward (Other QUERI leadership), Bonny Collins (Office of Quality Performance), and a representative from AHRQ.

The Operations Committee will be co-chaired by Drs. Duncan and Williams. The purpose of the Operations Committee is to assure attainment of all Stroke QUERI goals. They will monitor ongoing collaboration with both VA (Office of Quality and Performance, Physical Medicine and Rehabilitation, other QUERI's, VISN 8 Community Care Coordination Service, Rehabilitation Outcomes Research Center, VISN 6, 1 and 11) and non-VA partners (e.g. American Stroke Association). Further, the operations committee will assure resources are in place to execute Stroke QUERI objectives and will work to resolve any operational problems Stroke QUERI may experience. The Operations Committee is responsible for policy making and for development and continuing revision of the Stroke QUERI strategic plan.

Frequent interpersonal communication among the committees, cores, and project teams, will be necessary in order to forge a synergistic relation. Communication will be fostered through teleconferences, face-to-face meetings, and Microsoft Exchange. Each team executing Stroke QUERI goals will have a designated leader and will conduct bi-weekly conference calls with all of the team's investigators. The leaders of each team will be responsible for managing the team and providing oversight to each of the team's projects. The administrative coordinator and implementation research coordinator will be involved in all team conference calls and will be accountable for aligning the resources from the cores to achieve each of the teams' goals. An annual Stroke QUERI meeting will convene a day prior to the annual QUERI meeting in order to review progress of the strategic plan.

A unique aspect of the Stroke QUERI is its **Translation, Implementation, and Evaluation Core (TIEC)**. The TIEC of the Stroke QUERI will be led by Theresa Damush, PhD, Implementation Research Coordinator. Brad Doebbeling, MD, MSc and Linda Williams, MD will assist Dr. Damush in providing overall scientific direction to TIEC. Richard Frankel, PhD, will serve as the qualitative methodologist and Marita Titler, RN, PhD, will serve as the translational interventions methodology consultant. Additional members of TIEC will also include Douglas Ried, PhD, Neale Chumbler, PhD, and Chris Johnson, PhD. The TIEC provides complementary and synergistic strengths in key health services research modalities: healthcare organization, clinical epidemiology, implementation interventions, healthcare behavior, medical sociology, patient-centered interventions, and quantitative and qualitative data analysis. The TIEC will advise the QUERI work groups on the planning and evaluation of implementation efforts within each specific QUERI goal.

TIEC Conceptual Model: The most effective initiatives for organizational learning emphasize new guiding ideas, innovations in infrastructure, and theories, methods, and tools. [51, 52] Our research program is informed by the organizational change literature and work on the diffusion of innovations in social systems (see Figure 1: Stroke QUERI Graphic).[53-57]

We have effectively applied this model in a series of VA, AHRQ, and RWJ Foundation grants on Translating Research into Practice (TRIP). Our methodological focus is based on an understanding of macro- and microsystems. *Macrosystem* refers to the overall social and organizational structure of a healthcare system (e.g., VHA). A *microsystem* can be defined as a small group of people who work together on a regular basis to provide care to discrete subpopulations of patients.[58-60] An effective microsystem includes dimensions of leadership (organizational support), staff (staff focus, training, interdependence), patients (patient and community focus), and performance (results and feedback), and is supported by effective information exchange.[58, 60-62]

The uniqueness and strength of the TIEC in developing QUERI translation, implementation, and evaluation strategies lies in the competence the core has in translation science. TIEC has ample expertise to design and implement a rich portfolio of ongoing experiments using innovative technology for Quality Improvement (QI) efforts. The TIEC has

extensive experience in developing and testing translational interventions in hospital, clinic and community settings as well as expertise in directing Community Care Coordination Services (CCCS).

The TIEC will work to improve the discovery, evaluation, implementation, and sustained adoption of evidence-based best practices in the VA and the broader national health care system. Through a focused concentration on categorizing, elucidating and implementing best practices for veterans at risk for, or who have suffered recent stroke, the TIEC will advance the science and practice of translational research.

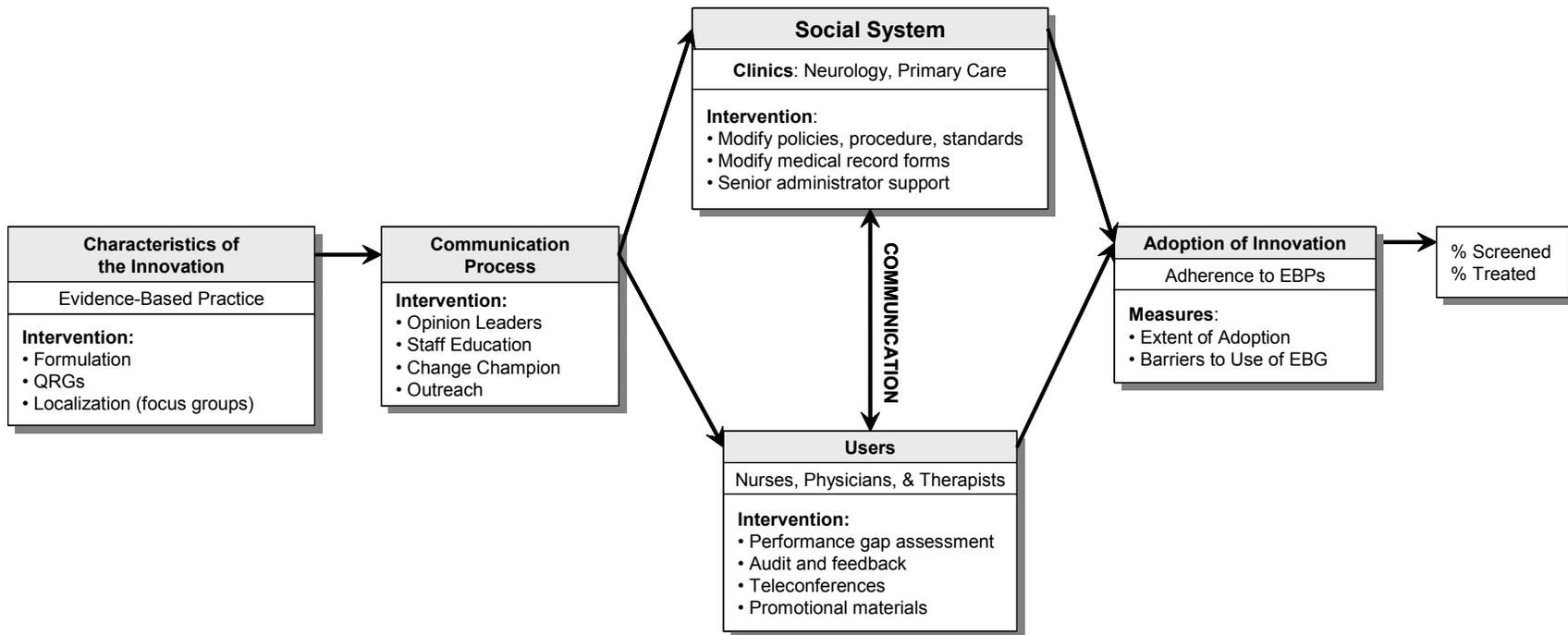


Figure 1. Stroke QUERI Graphic

The goals of the TIEC are to:

- Generate new knowledge about best practices for stroke through clinical and organizational research
- Identify organizational, provider- and patient-based factors that influence adoption of these best practices in VHA
- Design and test health system interventions to support, expand, and sustain the implementation of evidence-based practice in stroke patient care

To create synergy with other VA initiatives and enhance the implementation infrastructure, we will build on our present linkages with QUERI groups, the National Clinical Practice Guidelines Council (NCPGC), and key VACO offices. We plan to develop new liaisons with interested VISN Quality Managers, and clinical opinion leaders to learn from and share best practices. We will also disseminate project results back to key local managers and clinicians to disseminate knowledge of methods and tools of EBP implementation.

In general, we anticipate using formative research to design an intervention (e.g., tailored depression performance measure) that enhances communication about an innovation between the providers and other members of the social system who routinely care for veterans after stroke (e.g. primary and specialty care providers, nurses, therapists) within the system of post-stroke care (e.g. clinics, therapy, and other sites). We will evaluate the adoption of the tailored interventions by assessing compliance with the specific performance measures.[63] The specific intervention designed will typically be a multicomponent translational intervention, developed using our conceptual model and tailored to address the specific identified barriers and facilitators of the practice setting and condition of interest.

We will also emphasize the four-phase model of implementation activity, moving from phase 1 (single institution pilots to establish evidence of preliminary effectiveness), to phase 2 (an “efficacy” study of an organizational innovation, implementing the innovation under somewhat idealized conditions), which might be conducted in 4-8 facilities in 1-2 VISNs. Successful phase 2 projects will move on to phase 3 (large-scale assessment of its feasibility, acceptance and consistency with the full range of relevant VHA policies, procedures and organizational culture, to phase 4 (planning for national roll-out).

A critical part of our QUERI group translational research plan is to evaluate the effectiveness of an intervention and feedback recommendations to all stakeholders. After field-testing, investigators will formulate recommendations for wider implementation. We will utilize our clinical and management connections in VISNs 8 and 11 as a platform to disseminate findings locally and regionally. We plan to work closely with VISN and VACO leadership to effectively inform and sustain these efforts.

A key strategy involves incorporating managers and clinicians in these VISNs to enhance the local culture of implementing evidence-based practices. Our experiential work in Stroke QUERI implementing and evaluating interventions and the didactic efforts of our two centers' investigators will be integrated into existing structures like the Chief Medical Officer/Quality Management Officer conferences. Nationally, building upon our current collaboration with the QUERI groups and other centers, we will regularly communicate to share best practices. We will work with VACO to facilitate quarterly conference calls to share best practices and enhance involvement in regional and national VA implementation activities. Opportunities include the QUERI, Institute for Healthcare Improvement (IHI), and the National Association of VA Primary and Ambulatory Managers (NAVAPAAM) annual meetings.

Center investigators will work closely with VACO, VISN Quality Managers, QUERI groups and specific clinical and administrative leaders and champions to develop a series of bidirectional opportunities for dissemination of results and providing input to each point in the research cycle. This step effectively 'closes the loop' for continuous QI. Dissemination activities will be led by our dissemination core.

The Methods and Database Core will be led by Dean Reker, PhD, and co-led by Yongsung Joo, PhD. Data will be centrally managed at the Stroke QUERI's Research Coordinating Center housed at the Rehabilitation Outcomes Research Center. The core will provide methodological support and will be responsible for conducting all data programming and statistical analyses. Diane Cowper, MA, former Co-Director of VIREC, will provide expertise in the use of various databases and will work closely with the VIREC Stroke QUERI representative, Ruth Perrin.

The Dissemination Core will be led by Britta Neugaard, MPH. The core will serve as the dissemination vehicle for the Stroke QUERI. Ms. Neugaard will work with Geraldine McGlynn at the ORD Information Dissemination group to assure national exposure of the Stroke QUERI's products. An experienced Webmaster, Kristen Wing, will maintain the Stroke QUERI website. The dissemination core will produce an electronic newsletter and use other communication outlets to disseminate findings from the Stroke QUERI projects. The core will also develop any specific tools needed for intervention strategies (i.e. provider training materials) and will also oversee professional dissemination venues, such as publications in professional journals and presentations at professional meetings. Theresa Damush, Implementation Research Coordinator, will lead the core's patient centered product dissemination in the form of patient education materials. The program assistant will maintain the deliverables of the Stroke QUERI and will respond to requests for Stroke QUERI products.

Available Personnel

Lawrence Brass, MD, is Chief of Neurology at VA Connecticut Healthcare System and Professor of Neurology and Epidemiology and Public Health at Yale University. He is nationally recognized in stroke research and has contributed to the quality of care and outcome literature. He has funded grants in health services research and clinical epidemiology from the American Heart Association, National Institutes of Health, and the Agency for Healthcare Research and Quality. He was the principal neurologist on many clinical studies including the Hemorrhagic Stroke Project (largest case-control study of the causes of hemorrhagic stroke) and the Women's Estrogen for Stroke Study. He served on advisory boards and contributed to programs related to stroke and vascular disease for the Centers for Medicare and Medicaid Services, National Center for Quality Assurance, and the Joint Commission. Dr. Brass also chaired one of the first national efforts on performance measures and quality of care for stroke. He is currently on the Advisory Board of the RORC and contributing the development of the Integrated Stroke Outcome Database. He has served on national guideline committees for secondary prevention and disease management for the American Heart Association, American College of Cardiology, National Stroke Association, and the American Academy of Neurology. We are recommending that Dr. Brass chair the Executive Committee. He will also serve as a member on the Operations Committee, co-lead the Goal 3 Secondary Prevention Team and collaborate with Dr. Reker, and Dr. Duncan in Goal 1, work to establish key collaborations with external organizations and projects. In addition, Dr. Brass, along with Dr. Bravata, will expand the QUERI programs related to prevention in the next wave of the plan.

Dawn Bravata, MD, joined the Veterans Administration (VA) in 2000 where she practices Internal Medicine and serves as Director of the Multidisciplinary Stroke Clinic for the VA Connecticut Healthcare System at West Haven. Dr. Bravata is currently an Assistant Professor of Medicine at the Yale University School of Medicine and Assistant Director of the Robert Wood Johnson Clinical Scholars Program at Yale. Dr. Bravata conducts health services research in cerebrovascular disease; specifically related to four areas: the quality of care received by patients with acute ischemic stroke, the effectiveness of therapeutic interventions for patients with stroke in routine clinical practice, the identification and treatment of medical complications of stroke, and the prediction of outcomes for patients with stroke. Her current work, funded by the VA Health Services Research and Development (HSR&D) service, evaluates the quality of care received by patients admitted with a stroke. Dr. Bravata received a VA HSR&D Career Development Award in 2001. Dr. Bravata will serve as a resource to the Goal 3 Secondary Prevention Team.

Neale Chumbler, PhD, is a research health scientist in VA HSR&D/RR&D Rehabilitation Outcomes Research Center (RORC) and is an assistant professor in the Department of Health Services Administration at the University of Florida. Over the last 10 years, his research has identified and evaluated effective strategies by which to deliver accessible services and to improve patient centered outcomes for frail non-institutionalized older adults. Specifically, his current agenda consists of implementing and evaluating care coordination models, which are enhanced by home-telehealth technologies for veterans with disabling, chronic diseases to improve patient centered outcomes (e.g., health related quality of life), avert preventable health services, and assist informal caregivers. He has written and published over 40 articles in the areas of health services research, social gerontology, and medical sociology. Dr. Chumbler will be an investigator on the Goal 3 Secondary Prevention Team and will be a

member of the Translation, Implementation and Evaluation Core. He will serve as the liaison to the Community Care Coordination Service, and will be available to develop future proposals in collaboration with the Care Coordinator Service to enhance access and coordination of stroke rehabilitation services.

Diane Cowper, MA, is a recognized expert on VA Data Information Systems and is the Assistant Director for the RORC. Her role in the QUERI will be as a member of the Methods/Database and Dissemination Cores. Ms. Cowper will assist Drs. Joo and Reker in identifying VA administrative data sets that can be used to answer questions posed in the QUERI application, as well as identify potential gaps in information that need to be collected. Additionally, she will lend her knowledge and expertise of Geographic Information Systems (GIS) to map variations in treatment practice. Ms. Cowper will also work with the administrative core to disseminate findings from Stroke QUERI initiatives.

Brad Doebbeling, MD, MSc, is Director of HSRD at RVA, Associate Director for Health Services Research at The Regenstrief Institute, and holds the Indiana University School of Medicine (IUSM) Professorship in Health Services Research. Dr. Doebbeling is a nationally recognized implementation scientist with expertise in leading large research projects, mentoring, and developing NIH-funded research training programs. He has served on QUERI's Research Methodology Committee, VA's National Clinical Practice Guidelines Council's (NCPGC) Implementation and Education Subcommittee, and several IOM panels. He serves on advisory committees for VA, DoD, and CDC, including VA's NCPGC, its Clinical Reminders Subcommittee, and HSRD's Research Career Development Award Panel. He collaborates in multiple VA studies of organizational factors and implementation. He has been a primary mentor for 16 postdoctoral trainees and has served on career development review panels for NIH. The clinical research training programs he developed have garnered over \$7M from NIH K12 and K30 awards. He has been continuously funded since 1993 studying organizational factors which influence implementation of evidence. He has received four consecutive IIR grants from VA as PI since 1998 to investigate the relationship between VHA facilities' organizational characteristics and EBP. His research program has included 14 grants as PI and 7 as Co-PI, totaling over \$19M and over 100 published papers. Dr. Doebbeling will serve as an advisor to the Translation, Implementation and Evaluation Core. He will provide expertise in identifying intervention strategies to reduce provider and organizational barriers to guideline compliance.

Theresa Damush, PhD, is Assistant Scientist, Department of Medicine, IUSM and Research Scientist at the Regenstrief Institute, and Center Scientist at the IU Center for Aging Research. Dr. Damush is a social and health psychologist with over 6 years experience specializing in behavioral interventions for clinical populations in primary care. Her research focuses on interventions to increase patient self-management and patient behavior change using principles of goal-setting to increase patient confidence to self-manage their chronic medical problems. Dr. Damush has experience revising standard patient materials to make them accessible to the urban, vulnerable clinic populations. In addition, Dr. Damush has experience educating patients individually and in group settings. Dr. Damush' primary role will be to serve as the Implementation Research Coordinator and lead the Translation, Implementation and Evaluation Core. She will work with other TIEC members in identifying and implementing interventions that promote best practice. She will also work with the Project Manager to disseminate the results of Stroke QUERI findings.

Pamela Duncan, PhD, PT, Research Coordinator, is a physical therapist and epidemiologist who is nationally and internationally recognized for expertise in stroke rehabilitation. She has extensive experience in health services research and outcome assessment. She is Director of the Rehabilitation Research Outcomes Center of Excellence, the University of Florida Brooks Center for Rehabilitation Studies, and Professor of Health Services Administration. She has been continuously funded as a VA RR&D and HSR&D researcher for years and has extensive experience in leading multidisciplinary clinical research teams. (e.g. Associate Director of the Center For Health Policy and Research at Duke University where she served as project director of the AHCPR Stroke PORT 1991-1994) . Dr. Duncan was a clinical leader in development of the VA/DoD Clinical Practice Guidelines. Dr. Duncan will use her clinical, research, administrative, and health policy experience to lead and manage the Stroke QUERI. Her specific roles will include direction, long-term planning, and operations of the QUERI programs and personnel, including the local and national teams. In collaboration with the clinical director and the associate director of the research coordinating center she will continue to refine the QUERI agenda and proposals. She will supervise the QUERI Project Manager and assure projects and deliverables are completed as planned and that the QUERI goals are met. In addition, she will co-lead with Dr. Reker the Goals 1 and 2 Team.

Richard Frankel, PhD, is senior medical sociologist in the RVA HSR&D, Professor of Medicine and Geriatrics at IU School of Medicine and Senior Research Scientist at the Regenstrief Institute. His research focuses on clinician-patient communication and effective organizational change strategies. He has extensive expertise in qualitative research methods and has conducted a number of multimethod studies. In 1999-2000, he was recipient of the American Academy on Physician and Patient's Award for outstanding contributions to research and teaching on communication in the medical encounter. He has published more than 100 research papers in the area of clinician-patient face communication. He currently serves on several national boards and study sections, including both VA and AHRQ grant review panels. He will serve as Senior Qualitative Research Methods Consultant for the Translation, Implementation and Evaluation Core and will provide expertise in the conduction of qualitative data collection and analysis. .

Larry Goldstein, MD, is a neurologist who is a nationally and internationally recognized for expertise in stroke prevention and treatment as well as in stroke-related health policy. Dr. Goldstein is currently Professor of Medicine (Neurology), the Director of the Duke Center for Cerebrovascular Disease, and the Head of the Stroke Policy Program in the Center for Clinical Health Policy Research at Duke University and is an attending neurologist at the Durham VA Medical Center. He is also currently Chair of the Advisory Committee for the American Stroke Association, Vice-Chair of the Stroke Council of the American Heart Association, a member of the National Board of Directors of the American Heart Association, the Board of Directors of the Mid-Atlantic Affiliate, and Chair of Operation Stroke for the Research Triangle area of North Carolina. Through his work in Duke's Center for Clinical Health Policy, Dr. Goldstein has been interested in understanding optimal methods of care for patients at elevated stroke risk, including secondary prevention. He helped design and conduct the US National Survey of Physician Practices for Secondary and Tertiary Stroke Prevention as part of a team of investigators working on the AHCPR Stroke PORT. He has published extensively based on this work and on studies of statewide stroke facilities in North Carolina, physician practice audits, and stroke care within the VA system. As a member of the AHA Advocacy and Public Policy Committees, he has worked

to translate research into public policy by influencing national legislation. His laboratory work has focused on pharmacological effects on recovery after focal brain injury and he is principal investigator for an NIH-supported study of pharmacotherapy for post-stroke recovery. He will be an investigator on the Goal 3 Secondary Prevention Team and will provide expertise on improving anticoagulation management for individuals with atrial fibrillation.

Huanguang Jia, MPH, PhD, is currently Research Health Scientist with VA Rehabilitation Outcomes Research Center at Gainesville, concurrently Center Investigator with the Center for Research on Chronic Illness at the University of North Carolina at Chapel Hill (UNC), and Courtesy Professor with University of Florida's Department of Health Services Administration. His primary research areas include rehabilitation utilization, quality of life, and health services. Dr. Jia received his medical training from a health school in China, received his M.P.H. in health policy and administration, and Ph.D. in medical anthropology from UNC at Chapel Hill. In addition to his clinical teaching work at Peking Union Medical College in China and at UNC School of Nursing at Chapel Hill, he has served as Director of World Bank Office at Chinese Academy of Medical Sciences with primary responsibilities including daily management of the office, evaluating all health-related programs funded through World Bank loans, training program managers, and preparing program and financial reports for the Bank. He has worked as Manager for gastrointestinal clinical research at UNC School of Medicine, and provided research coordination, data management, statistical, analytical and methodological support, research questionnaire design and research progress report preparation for a six-year multi-center multi-treatment phase III clinical trial on functional bowel disorders. His 1998 report to the project's Data Safety and Monitoring Board was adopted by the National Institute of Health as model progress report for its related clinical trial projects. Dr. Jia will serve on the Methods and Database Core to assess variation in management of stroke patients and will be an investigator on the Goal 4 Depression Management Team. Dr. Jia will also assist Ms. Britta Neugaard in her project management duties.

Christopher Johnson, PhD, is a Research Health Scientist at the Rehabilitation Outcomes Research Center (RORC) and is an Assistant Professor in the Department of Health Services Administration at the University of Florida's College of Public Health and Health Professions. Dr. Johnson recently completed work investigating quality indicators in nursing homes as part of a legislative task force that recommended long-term care reforms for the State of Florida. He is heavily involved in developing techniques that will be used by the RORC to track rehabilitation care for veterans in community nursing homes. Dr. Johnson has published work in peer reviewed health services research journals looking at how organizations impact structure, process, and outcomes in nursing home and medical group practice settings. Dr. Johnson will serve on the Translation, Implementation and Evaluation Core and will offer guidance in assessing organizational factors that impede or facilitate evidence-based practice.

William Jones, MD, is a neurologist health services researcher at RVA HSR&D and Assistant Professor of Neurology at IUSM. His interests include development of stroke risk prediction models using medical informatics data and interventions to improve best practices in stroke risk reduction. His Research Career Development Award (CDA) runs through 6/06 and he will participate as a Goal 4 investigator.

Yongsung Joo, PhD, is a Health Research Scientist at Rehabilitation Outcomes Research Center (RORC) at the Malcolm Randall VA Medical Center, Gainesville, FL and an Assistant Professor in Biostatistics Department at University of Florida. At RORC, he provides high quality of statistical analyses to numerous investigators, which is essential for maintaining the integrity of research projects. As a statistician, he has research interests in model selection, Bayesian modeling, microarray analysis, and predictive distribution.

Rita Kobb, ANRP, has been with the Veterans Health Administration (VHA) for over fifteen years. She has been a Gerontological nurse practitioner for the past 7 years. Prior to that she worked as a Gerontological clinical nurse specialist. Mrs. Kobb holds Bachelor's and Master's degrees in Nursing from the University of Florida. In 1999 she was part of a conceptual planning team to develop a new model of care for high-risk, high-use, and high-cost veterans in the Sunshine Network (Florida-Puerto Rico) using care coordination and home telehealth technologies. From February 2000 to January 2004 she was the Lead Care Coordinator for a care coordination and home telehealth program, the Tech Care Coordination Program located in Lake City, Florida as part of the North Florida/South Georgia Veterans Health System. Mrs. Kobb has been selected to the newly created VHA Office of Care Coordination as its Education Program Specialist and will be the Director of the new national training center for care coordination and home telehealth located in VISN 8. Since 2000, Mrs. Kobb has spoken all over the country about care coordination and home telehealth in VHA. She has been recognized as an expert consultant in care coordination and home telehealth and currently serves as Chair of the American Telemedicine Association's Home Telehealth Special Interest Group. Ms. Kobb will serve on the Translation, Implementation and Evaluation Core and will provide expertise in the area of care coordination.

Clifford Marshall, MS, is a Rehab Planner for the Physical Medicine and Rehabilitation Program Office of the Rehabilitation Strategic Healthcare Group of VA Central Office. In the role, Mr. Marshall also serves as the Data Steward for the Functional Status and Outcomes Database for rehabilitation housed at the Austin Automation Center. Additionally Mr. Marshall is the Contracting Technical Representative for the national contract that exists between VHA and the Uniform Data System for Medical Rehabilitation (UDSMR). Mr. Marshall has been instrumental in the development of the Integrated Stroke Outcomes Database and he currently manages the VACO functional status performance measure for stroke admissions to the VA. Mr. Marshall has served in the capacity of co-investigator on a number of funded research grants and is a member of the Field Advisory Group for the Rehabilitation Outcomes Research Center of the Gainesville VAMC. He will serve on the Goals 1 and 2 Stroke Rehabilitation Teams and will assist in the evaluation of the EES program and advocate for development of performance measures for access to rehabilitation.

David Matchar, MD, is a physician and health services/decision science researcher. He is director of the Duke Center for Clinical Health Policy Researcher. Matchar focuses his work on evaluation of clinical practice based on "best evidence", and implementation and evaluation of innovative strategies to promote practice change. He is Director of the Duke Evidence-based Practice Center, one of 12 such centers designated by the Agency for Healthcare Research and Quality (AHRQ). A major component of his research agenda relates to stroke. Dr. Matchar was the principal investigator for the Stroke Patient Outcome Research Team, a 7-year, multidisciplinary program addressing clinical interventions for secondary stroke prevention. He

was the principal investigator of the VA Stroke Study to examine practice patterns and outcomes for a prospective cohort in 8 VA hospitals. Currently, he is the principal investigator of a 3,200 patient VA Cooperative Study (#481, The Home INR Study (THINRS)) aimed at studying the efficacy of patient self-testing for reducing thromboembolism (primarily stroke) and bleeding for patients on warfarin. Dr. Matchar's role will be to offer leadership to the Operations Committee and co-lead the Goal 2 Secondary Prevention team.

Charlene McCarthy, MPH, is a research coordinator for the Rehabilitation Outcomes Research Center working on a patient-centered model to manage chemotherapy-related symptoms for cancer patients using home telehealth technology and care coordination. Ms. McCarthy has worked extensively with patients in the care coordination program and can offer insights into their daily care and medical therapy compliance issues. Ms. McCarthy will be a member of the Translation, Implementation and Evaluation Core and will provide insight into patient factors that improve adherence to medical therapy. In addition, she will also serve on the Dissemination Core and will provide assistance in developing patient appropriate educational materials.

Britta Neugaard, MPH, is currently a Health Science Specialist with the VA Rehabilitation Outcomes Research Center at Gainesville, and doctoral student in the Department of Health Services Administration at the University of Florida. She recently served as project director of a HRS&D funded study that examined barriers to implementing the VHA's clinical practice guidelines for ischemic heart disease. She has extensive experience in project management, database management, survey methodology, and in using the National Patient Care Database and KLF MENU. She will serve as the Project Manager and will act as the point of contact for the Stroke QUERI group and will coordinate all on-going Stroke QUERI projects. She will participate as a member on the Operations Committee, Methods/Database Core, and will lead the Dissemination Core.

Douglas Ried, PhD, is a Research Health Scientist at the Rehabilitation Outcomes Research Center of Excellence at the Malcom Randall Medical Center in Gainesville FL. Dr. Ried also is Associate Professor and Assistant Dean in the College of Pharmacy at the University of Florida. Dr. Ried has a longstanding interest in geriatric pharmacy practice. He is currently conducting research into the effects of drugs on patients' quality of life and the psychosocial aspects of elderly patients and psychotropic drug use. He also has conducted a major project investigating the link between use of different antihypertensive medications and the onset of depressive symptoms. His other research interests include patient drug-taking compliance, evaluation of clinical pharmacy services, and effective treatment of post-stroke depression. He has been funded with grants from the National Institute on Aging and the Agency for Health Care Policy and Research (now Agency for Healthcare Research and Quality). He also served on the panel that wrote the National Institutes of Health State-of-the-Science Conference Statement Symptom Management in Cancer: Pain, Depression, and Fatigue. He is a Fellow of the American Pharmaceutical Association. Dr. Ried will be a member of the Translation, Implementation and Evaluation Core and an investigator on the Goals 3 and 4 Teams. He will provide expertise in increasing patient compliance to drug therapy.

Dean Reker PhD, RN, Associate Research Director, is a nurse and has been a health services researcher since receiving his doctorate in Health Services Research from the St. Louis

University School of Public Health in 1989. He has been conducting stroke rehabilitation research in the VA since 1996 at the Durham VA, the Kansas City VA, and at the Center on Aging, KU Medical Center. He has published several articles and abstracts on stroke care structures, processes, and outcomes, has served on a national advisory panel for an upcoming Medicare stroke study, and was a participant in the joint VA/DoD initiative to create a new Clinical Stroke Guideline. He is a principal investigator and leader in the RORC. He has been the major architect for the RORC Integrated Stroke Data Base. He is an avid data manager and regularly uses the VA national databases such as the National Patient Care Database and the Functional Status Outcomes Database. Dr. Reker will be the lead for the Database/Management core. He will manage all the databases for the QUERI and supervise all the queries to the ISOD. He will provide invaluable guidance through his extensive experience in rehabilitation outcomes research to refine and execute the QUERI deliverables. Dr. Reker will serve on the Operations Committee, will lead the Methods/Database Core, and will co-lead with Dr. Duncan the Goals 1 and 2 Stroke Rehabilitation Teams.

Barbara Sigford, MD, is the National Program Director of Physical Medicine and Rehabilitation Service (PM&RS). She is also Chief of PM&RS at the Minneapolis VA Medical Center. In these roles, she is responsible for maintaining excellent quality comprehensive medical rehabilitation programs both locally and nationally. Promoting and maintaining high quality stroke rehabilitation programs is essential for VA rehabilitation services and a major interest. The Minneapolis Stroke Rehabilitation Team members were essential contributors to the nationally adopted clinical guidelines for stroke care. In addition, she has been principal investigator for the Defense and Veterans Brain Injury Center research program since 1992 and currently serves on the Oversight Committee for this group. She is a Clinical Assistant Professor at the University of Minnesota. Dr. Sigford will advise the Goals 1 and 2 Stroke Rehabilitation Teams to translate findings into clinical care and VA policy.

Marita Titler, PhD, RN, is Director of Research, Quality and Outcomes Management, Department of Nursing Services and Patient Care, Director, Research Dissemination Core, Gerontological Nursing Intervention Research Center, and Professor of Nursing, University of Iowa. Dr. Titler is one of the country's leading translational researchers, whose well-funded program of research focuses on multidisciplinary interventions and involvement of clinicians and managers to improve best practices. Dr. Titler is in the final stages of negotiation for a research chair position at the IU School of Nursing, and a VA HSR&D position at RVA. Regardless of her eventual location, she has agreed to continue to actively collaborate with the RVA and Stroke QUERI. As an expert in translational research, she will serve as a consultant to the Translation, Implementation and Evaluation Core in their development of intervention strategies.

Linda Williams, MD, is RVA Staff Physician, HSR&D, Associate Professor of Neurology (with tenure) at IUSM, and a Regenstrief Institute Research Scientist. Dr. Williams is an accomplished health services researcher, who participates in national guidelines development, has experience leading multisite intervention studies, and is nationally-recognized for her work to improve outcomes of veterans with stroke. She brings expertise in intervention and implementation research, patient-centered implementation of best evidence, and quantitative measurement. She has evaluated the impact of variation in VA outpatient utilization after stroke on long-term mortality and the contribution of depression to veterans' post-stroke mortality. She is the Clinical Coordinator of the Stroke QUERI (conditional approval 10/03, Strategic Plan in

review), and directs its post-stroke depression focus. Importantly, she will collaborate directly with the Implementation Research Coordinator for the Stroke QUERI, who will also be a core faculty member. Dr. Williams directs an NIH-funded study of collaborative care emphasizing nurse case-management to implement best evidence in post-stroke depression treatment and collaborates extensively on the healthcare epidemiology of depression and pain in outpatients and self-management. She has served on guidelines development committees for the American Heart Association (AHA) and American Academy of Neurology (AAN) and on the AHA Cerebrovascular Quality of Care and Outcomes Group. She currently serves as the Health Services Research Topic Chair for the Scientific Program Committee of both national organizations. Dr. Williams is finishing the last year of her VA HSR&D Advanced Research Career Development Award. Dr. Williams is Clinical Coordinator and will serve on the Operations Committee, Translation, Implementation and Evaluation Core, and as an investigator on the Goal 4 Depression Management Team. She will work with Dr. Duncan to provide overall leadership of the Stroke QUERI.

Kristen Wing, BA, is a Program Specialist at the Rehabilitation Outcomes Research Center (RORC). In this role, she serves as Webmaster for both the RORC and the Brain Rehabilitation Research Center (BRRC), responsible for the content, design, and maintenance of each center's web site. She is also an integral part of the RORC's dissemination efforts, with an extensive background in the design and production of documents for both print and online. She will be a member of the Dissemination Core and will be responsible for maintaining the Stroke QUERI website.

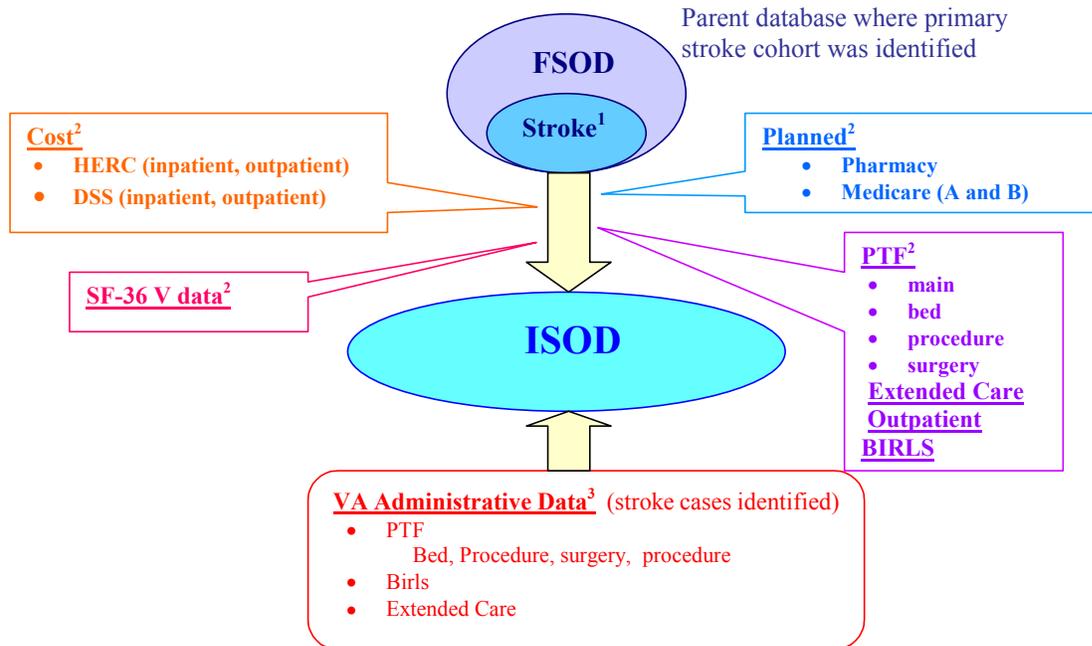
Data Infrastructure

The Functional Status and Outcomes Database (FSOD) for Rehabilitation offers rehabilitation clinicians and managers the ability to track outcomes through the full continuum of rehabilitative care. This database was established in June 1997, through a cooperative agreement between the VHA Central Office of Physical Medicine and Rehabilitation, the Uniform Data System for Medical Rehabilitation (UDSMR), and the Austin Automation Center. The FSOD is based on the Functional Independence Measure (FIM), a valid and reliable disability assessment tool. Developed by UDSMR, the largest national registry of standardized information on medical rehabilitation inpatients in the United States, the FIM is considered to be the rehabilitation industry standard. The FSOD allows VA rehabilitation programs to track a variety of outcomes from the initiation of rehabilitative care in the acute setting, through inpatient rehabilitation, home care, and into the outpatient setting as well as in subacute and nursing home settings.

The data stored in the FSOD is available to VA and non-VA researchers. Access to use of the FSOD is approved by the PM&R VHA Central Office. The FSOD is also the source of information used to measure network compliance with the Network Performance Measures for selected patient populations as described in VHA Directive 2000-016, "Medical Rehabilitation Outcomes for Stroke, Traumatic Brain Injury, and Lower-Extremity Amputee Patients."

The ISOD database is a collection of VA clinical and administrative data containing patient information on a cohort of stroke patients found in the Functional Status Outcomes Database (FSOD)³, National Patient Care Database (NPCD)⁴, and other VA sources. Patient information in ISOD consists of the following data components: demographics, Functional Independence Measure (FIM) (reference) scores, procedure records, bed section stay information, surgery records, outpatient visits, extended care records, quality of life data, vital status, and costs of treatment.

Figure 1. Graphic depiction of ISOD for FY2001.



1. The Stroke cohort from the Functional Status Outcomes Database (FSOD) was used as the foundation for creating the ISOD.
2. Data from these sources were obtained for patients in the FSOD stroke cohort.
3. Additional stroke data was obtained from VA administrative data using Reker's high specificity, Reker's high sensitivity and ARC stroke algorithms. No corresponding cost or SF-36 V data was obtained for these patients.

The foundation of the ISOD is a cohort of patients who were identified by VA clinicians as having a new stroke, evaluated using the Functional Impairment Measure (FIM)⁵, and entered into the FSOD. The cohort, defined by codes of 1.1 through 1.9 (strokes) in the impairment group field of the FSOD, consists of 3,308 unique stroke patients with 3,588 patient admissions in FY 2001. Health care services for these patients were provided in 182 unique treatment settings (some VA facilities may have more than one treatment settings for stroke, i.e. acute rehabilitation unit, subacute rehabilitation unit, nursing home). All stroke cases were selected if their rehabilitation discharge occurred during the fiscal year 2001 (October 1, 2000 through September 30, 2001).

Table 5. Database or datafiles to be used by different goals, objectives, and actions

Database Name	Database Location	A Brief Description	Stroke QUERI Goals and Objectives
FSOD	AAC, Austin, TX	This Functional Status Outcomes Database (FSOD) contains FIM and demographic information on rehabilitation patients treated in the VHA.	Goal 1, Objectives 1&3, Goal 2, Objectives 1&2
ISOD	VA RORC, Gainesville, FL	The Integrated Stroke Outcomes Database (ISOD) is one of RORC's products. It is a compilation of existing VA data taken from multiple sources (FSOD, VA Administrative databases, and Medicare) and matched to a known cohort of VA stroke patients.	Goal 2, Objectives 1&2
VA NPCD	AAC, Austin, TX	Data files to be used from this database are: PTF main, bedsection, extended care, HERC inpatient extracts and outpatient file.	Goal 2, Objectives 1&2
ISOD, NPCD, and PBM	VA RORC, and AAC, Austin, TX	These databases will be used to identify patients with stroke and AF, receiving anticoagulation treatment.	Goal 3, Objective 1
LAR	National DSS extract of laboratory data	New VHA database beginning FY04 that will have national INR values for patients receiving anticoagulation treatment.	Goal 3, Objective 1
CoaguCare Database	VA VISN 8	Facilitators and barriers to patient self-management of anticoagulation treatment.	Goal 3, Objective 2
VA and Non-VA Rehabilitation Utilization Data	From H Jia's Investigator Initiated Project titles "VA and Non-VA Rehabilitation Utilization" (HSR&D Proposal pending)	This datafile will include VA-Medicare-Medicaid rehabilitation utilization and diagnosis for all stroke patients (high sensitivity algorithm) living in Florida.	Goal 4, Objective 1, Action 6 (Link VA, Medicare, and Medicaid data to evaluate differences between veterans with and without VA follow-up post-stroke)

Data Use and Maintenance Policy

This data use and maintenance plan applies to all the data to be used in this strategic plan for Stroke QUERI. The Stroke QUERI is engaged in two types of data management: 1) the compilation and analysis of secondary data derived from other VA and non-VA sources such as the Integrated Stroke Outcomes Database (ISOD), the VASt Study data, the Indianapolis Stroke Dataset (ISD), and the QUEST Project database, and 2) the management of new data obtained by the Stroke QUERI from surveys, interviews, and observational studies.

All the secondary data compiled by the Stroke QUERI from other sources will NOT be shared unless the following conditions are met:

- Researchers will use the data for IRB-approved research consistent with the Stroke QUERI goals;
- The researchers obtain a data use agreement from the data originator, specifying that this QUERI has permission to release specified data elements for use in a specified study, or
- The Stroke QUERI has an existing data re-use agreement with the data originator specifying conditions under which the Stroke QUERI is permitted to share the data with a third party.

All Stroke-QUERI-generated data will be shared with researchers to be used for IRB-approved research consistent with the Stroke QUERI goals.

Provision for the ongoing maintenance of data systems beyond the completion data of QUERI-related funding must be made by the principal investigator(s) of each project.

All Stroke QUERI data use will be consistent with VA policies and HIPPA regulations

Table 6. Investigator Initiated Projects

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
Processes and Outcomes of Stroke Care in VHA: (RR&D:O2-24116RA) D. Reker, PI	1) Identify the rehab processes associated with functional gain during a rehab stay in 2 rehab settings; 2) determine the linkage of key rehab structures to process of care; and 3) identify potential quality indicators of rehab care.	01/07/03 – 06/30/05	Ongoing	Goal 1. Variation in stroke guideline compliance in 50 VAMC sites. Structure-process linkages to identify determinants of guideline compliance
Quality of Care indicators for Veterans with Stroke in Community Nursing Home: (IIR 02-284-1) C. Johnson, PI	The purpose of the study is to describe the utilization and quality of care for veterans diagnosed with stroke whose care was being paid for by the VA in community nursing homes from 1999-2002. The specific objectives are to: 1) Define the characteristics of different nursing homes; 2) compare CMS MDS nursing home facility level quality indicators for residents diagnosed with stroke; 3) examine the patient-level variations in therapy utilization; and 4) determine the patient-level outcomes variations.	10/01/03 – 09/30/05	Ongoing	Goal 1. Determine variation in structure, process, and outcomes for veterans with stroke being cared for in nursing homes
Quality Evaluation in Stroke (QUEST): (IIR 011040-3) Bravata, PI	The primary aim of this study is to identify processes of care, received by patients hospitalized with an acute ischemic stroke or transient ischemic attack (TIA), that are independently associated with a reduction in the combined endpoint of in-hospital mortality or institutionalization, adjusting for age, comorbidity, stroke severity, and brain imaging findings. We will examine seven processes of acute stroke care that have been accepted as quality measures by national organizations interested in stroke care: fever management, hypoxia management, blood pressure management, neurology assessment, swallowing evaluation, deep vein thrombosis prophylaxis, and early mobilization. The hypothesis is that specific processes of acute stroke care decrease in-hospital mortality or institutionalization. To address this primary aim, we are proposing a retrospective cohort study of 2960 patients with acute ischemic stroke or TIA at six	07/01/03 – 06/30/06	Ongoing	Goal 1: The results from this project will provide information on how veterans with stroke are cared for in geographically diverse centers and compare that care to affiliated hospitals. Processes of care will be linked to outcomes and may expand our understanding of how specific aspects of stroke care affect outcome.

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
	participating hospitals (including both veteran and civilian hospitals).			
THINRS: (CSP-481) D. Matchar, PI	This project is a trial of the clinical impact of Patient Self-Testing of prothrombin time by international normalized rationalized ratio (PT-INR or INR) with weekly testing compared to high quality anticoagulation management (HQACM) with conventional monthly testing.	04/01/02 – 02/31/06	Ongoing	Goal 3: THINRS Phase I examines patient characteristics that predict ability to effectively use home monitoring technology; provides input to patient tailoring tool for Step 6.
Intervention Model for the Stroke Policy Module: (1R03-HS11746-01) D. Matchar, PI	The purpose of this project is to improve the functionality of an existing validated simulation model of the epidemiology of stroke, the Stroke Policy Model (SPM). Core tasks are to develop taxonomy of decisions relevant to stroke policy, and to create an efficient programming mechanism for adapting the SPM to classes of decisions in the taxonomy.	09/01/02 – 08/31/03	Ongoing	Goal 4: With appropriate VA data can provide projections of health and resource use impact of improved stroke care.
A Randomized Trial for Treatment of Post-stroke Depression: (R01NS39571-01) L. Williams, PI	This is a randomized, single blind trial of a case-management model of depression treatment vs. usual care in patients with post-stroke depression (N=240). An equal number of non-depressed stroke survivors are also enrolled to examine the risk factors for developing post-stroke depression. Family caregivers are also enrolled to examine the effect of depression on the patient-caregiver dyad.	09/30/00 – 09/29/04	Ongoing	Goal 4 (PSD) Objective 4: Report on performance characteristics of depression screening tool.
Implementing evidence in the detection and treatment of post-stroke depression VISN Implementation	This planning grant will allow us to: 1) Identify key collaborators in VISNs 8/11 to study implementation of best evidence in post-stroke depression, examine post-stroke utilization patterns to identify common sites where stroke patients follow-up in the VA, and 3) conduct pilot qualitative interviews to identify patient, provider and system barriers to post-stroke depression detection and treatment. From these data we will develop a PSD implementation strategy and pursue funding through SDP or IIR	6-month planning grant	Ongoing	Goal 4, Objective 1): Summary of patterns and determinants of f/u after stroke (PSD Goal 1 Action 3); Algorithm to maximize outpatient access to/identification of Algorithm to maximize

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
Planning Grant 1/04-7/04 L. Williams, Co-PI	mechanisms.			outpatient access to/identification of stroke pts (PSD Goal 1, Action 5); Data re: provider and patient barriers to best PSD care (PSD Goal 3, Objective 1)
Effects of Aging on Processes of Care in NIA Award (1 RO3 AG022075-01) L. Brass, PI	<p>This study will analyze the National Stroke Project database. The National Stroke Project was part of a Center for Medicare and Medicaid Study program looking at quality indicators for stroke care, by state, among Medicare beneficiaries [Jencks, 2003 #2645].</p> <p>The National Stroke Project is not based on administrative data. It is based on the complete medical record, has high quality, detailed clinical data abstracted under the highest standards, and can provide important insights into the quality and appropriateness of stroke care delivered to the elderly.</p> <p>The objective of this award is to provide insight into how aging influences stroke care both directly and through its association with other factors including demographics, clinical comorbidities, hospital and physician characteristics, and geography.</p>	12/1/03 – 11/30/05	Ongoing	Goal 1. Identify disparities in care among older Americans. This information will help inform QUERI members about potential targets for future projects and may indicate a need to check for similar patterns of care in the VHA.
Process-Outcome Links in the National Stroke Project Award (1 RO3 HS013940-01), L.Brass, PI	This project will also analyses based on the National Stroke Project database. The primary aim is to determine whether specific processes of stroke care are associated with better outcomes among patients hospitalized with acute ischemic stroke. The secondary aim is to explore if, among processes of care associated with better stroke outcomes, the associations are independent of patient and structural characteristics.	12/1/03 – 11/30/05	Ongoing	Goal 1: The results of this work will help identify processes and structure elements of stroke care that may be potential targets (opportunities) for interventions within the VHA.

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
<p>Investigating Patient-Specific Cost Estimates for VA Rehab Patients</p> <p>B. Vogel, PI</p>	<p>The broad objective of this research is to assess existing sources of data on patient-specific costs for VA rehabilitation patients and to understand whether it is necessary to develop more accurate estimates of the treatment costs for VA rehabilitation patients. Ultimately, the proposed research will be an important first step in placing VA rehabilitation cost estimates on a par with VA acute medical-surgical cost estimates and in enabling rehabilitation patients to be included in system-wide studies that require comparable patient-specific cost estimates. A second objective is to provide a valuable benchmark for comparing VA and private-sector costs for rehabilitation services. A third objective is to strengthen collaboration between HERC and RORC.</p>	<p>Begin date: 7/1/2002 End date: 6/30/2004</p>	<p>Ongoing</p>	<p>Goal 2: Rehabilitation treatment for stroke patients</p>
<p>Long-term Outcome among Stroke Survivors (American Heart Association PRT Outcomes Award #: 0270074N),</p> <p>L. Brass, PI</p>	<p>Dr. Brass and colleagues have created an opportunity to develop a population-based national cohort study. This project will span 8 years of data and include approximately 600,000 annual hospital discharges for stroke and stroke-related diagnoses. The specific aim is to evaluate a broad range of long-term outcomes following ischemic stroke. The health of stroke patients reflects not only their stroke, but the cumulative effects of their comorbid diseases, the consequences and effects of their neurological deficits including increased frailty, and the relentless biological processes of aging.</p>	<p>1/1/02 – 12/31/04</p>	<p>Ongoing</p>	<p>Goal 1: The results of this work will inform the stroke QUERI about long-term outcomes across a broad-range of measures including: stroke and related outcomes; vascular non-stroke outcomes; stroke related non-vascular outcomes, and non-stroke, non-vascular outcomes.</p>
<p>Development of Risk Adjustment Models for Stroke Rehabilitation Outcomes.</p> <p>B. Vogel, PI</p>	<p>The project will compare available diagnosis-based and function-based risk-adjustment measures and then develop comprehensive risk-adjustment models, incorporating both diagnosis and function, for three stroke rehabilitation outcomes. The proposed study is a secondary analysis of VA administrative data looking prospectively at outcomes for patients who have been hospitalized for stroke. The analyses will use a recently validated</p>	<p>7/1/03 - 6/30/06</p>	<p>Ongoing</p>	<p>Goals 1, 2, and 4</p>

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
	<p>database called the Integrated Stroke Outcomes Database (ISOD). This database incorporates longitudinal inpatient, outpatient, and medical rehabilitation information on stroke patients from a variety of sources within the Veteran Affairs (VA). We will use the ISOD to undertake a thorough analysis of how well the leading diagnosis- and function-based risk-adjustment methods predict three important rehabilitation outcomes pertinent to stroke patients: discharge functional status, 3- and 6-month rehospitalization, and 3- and 6-month mortality. Multivariate regression models will be built using each of the diagnosis- and function-based measures and measures of fit will be compared to assess which measure has the best predictive capability for each of the three outcomes. The measure that accounts for the most variance in the rehabilitation outcome (discharge functional status, rehospitalization, and mortality) will be used as a foundation for building a comprehensive risk-adjustment model that incorporates both diagnostic and functional information.</p>			
<p>Depressed Mood and Antidepressant (ADT) Treatment among Post-stroke Veterans: (B03-3487R) D. Ried, PI</p>	<p>1) Describe the prevalence of mood disorders and utilization of ADT among veteran stroke patients 6-month before & 12-Month after the stroke event; 2) Ascertain the sensitivity and specificity of mood disorder in automated files; 3) evaluate the feasibility of conducting a nationwide retrospective study to compare early treatment and non-early treatment patients on health outcomes and functional status.</p>	<p>24-month study</p>	<p>Pending</p>	<p>Goal 4, Action 1): Report of antidepressant prescribing patterns</p>

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
<p>Development of a Risk Model for Recurrent Stroke Using Electronic Medical Records Data</p> <p>W. Jones, PI</p>	<p>This project constructs and validates a recurrent stroke risk model using data from national VISTA databases and clinical data from local VA electronic medical records (CPRS).</p>	<p>24-month study (Approved LOI)</p>	<p>Pending</p>	<p>Goal 3: Anticoagulation</p>
<p>Stroke Hospitalization in the Elderly with Medicare FFS, Application #: 1 RO1NS043322-01A1)</p> <p>L. Brass, PI</p>	<p>The overall goal for this project is to build the foundation for such a surveillance system. Dr. Brass and colleagues have assembled an unprecedented national resource by creating a longitudinal Medicare database for patients hospitalized with vascular diagnoses over the years 1992-1999, with the capability of extending it into future years (through 2002 as part of this project). Previous studies using Medicare databases have employed a cross-sectional approach, not linking, at the patient level, the entire Medicare Part A (hospital admissions) database over time. Not even the Centers for Medicare & Medicaid Services (CMS) have developed such a database.</p> <p>Our investigators have proposed the following specific aims:</p> <ol style="list-style-type: none"> 1. To determine rates of stroke admissions among Medicare beneficiaries in the United States 2. To determine rates of hospital mortality and 30 day mortality following stroke among Medicare beneficiaries in the United States 3. To determine patterns of stroke among subgroups including by age, race and ethnicity, and by economic, political, and geographic characteristics 4. To measure trends in stroke rates over time 	<p>12/1/04 – 11/31/08</p>	<p>Pending</p>	<p>General: The results of this project will help better define the impact of stroke among the elderly, inform policy-makers and clinicians within the Stroke QUERI in planning for the health care needs of stroke patients, and help identify target for interventions to enhance the care of patients with stroke.</p>

Project Title, Number and P.I.	Project Description	Begin-End Dates	Project Status	Stroke QUERI Related Products
VA and Non-VA Rehab Utilization by Veterans with Acute Stroke: H. Jia, PI	This study is to understand the utilization and outcomes of stroke rehab services by veteran stroke patients living in the state of Florida who used single source of care (VA only) vs. those patients who received care from multiple sources (VA and Medicare, VA and Medicaid, and VA, Medicare and Medicaid) in 2000 and 2001.	24-month study	Pending	Goal 4, Objective 1, Action 6: (Link VA, Medicare, and Medicaid data to evaluate differences between veterans with and without VA follow-up post-stroke).

VA and Non-VA collaborators and related Stroke QUERI goals and activities

Table 7. VA Collaborators

Collaborators' Name and Affiliation	Collaborator's Projects or Resources Related to Stroke QUERI's Goals	Stroke QUERI's Related Goals and Activities
<p>The <u>Rehabilitation Outcomes Research Center (RORC)</u> at the North Florida/South Georgia Veterans Health System Director: P. Duncan</p>	<p>The mission of the RORC for Veterans with Central Nervous System Damage (CNS) is to enhance access, quality, and efficiency of rehabilitation services through interdisciplinary research and dissemination activities. The 3 special research areas for the RORC are: 1) evaluating, developing, and integrating clinical and administrative data to evaluate structure, process, and outcomes of rehab services; 2) advancing outcomes measurement in CNS damage and rehab; and 3) evaluating emerging therapies and technologies. The Center has 16 core investigators, 16 affiliated investigator, and a strong team in statistical, methodological and administrative support. One of RORC's products, the Integrated Stroke Outcomes Database (ISOD), is a compilation of existing VA data taken from multiple sources and matched to a known cohort of VA stroke patients.</p>	<p>An important goal of the RORC is to develop an Integrated Stroke Outcomes Database (ISOD) that consolidates many VA administrative and clinical databases into one database structure. This database will increase capacity and understanding of VA data to facilitate stroke outcomes research in the VHA. The ISOD will be used in some capacity by many if not all QUERI goals and objectives.</p>
<p>VA Mental Health QUERI (MHQ): Research Coordinator: R. Owen, Jr Clinical Coordinator: S. Marder</p>	<p>One of the Service Directed Projects for the MHQ is to improve care for depression through collaborative care for major depressive disorders in primary care settings. The TIDES/WAVES project of MHQ focuses on translation of collaborative care models for depression and evidence-based quality improvement as a method to disseminate collaborative care. The project's long-term goal is to create a resource that would be useful to VISNs and VAMCs interested in improving depression care. Its 3 immediate objectives are to 1) adapt an effective depression collaborative care model to diverse VA settings; 2) develop evidence-based quality improvement to support implementation of collaborative care in multiple VA settings; and 3) use a process evaluation approach to evaluate the success of intervention implementation. The research team at MHQ has developed numerous depression care tools, and the TIDES/WAVES project is in the field in 3 VA VISNs (10, 23, and 16). Preliminary results suggest that the intervention helps improve process and outcomes of care and treatment adherence.</p>	<p>The Stroke QUERI will work with the MH QUERI to identify overlapping areas of interest in the identification and treatment of depression in patients with stroke. Dr. Williams is PI of an ongoing 4-site study examining the effect of a collaborative care intervention vs. usual care for the treatment of PSD. We will consult with the MH QUERI to inform the design of our implementation studies and to engage MH clinicians and researchers to address the problem of PSD.</p>

Collaborators' Name and Affiliation	Collaborator's Projects or Resources Related to Stroke QUERI's Goals	Stroke QUERI's Related Goals and Activities
VA Physical Medicine and Rehabilitation Service (PM&RS)	PM&RS is a VA clinical department that provides rehabilitation services in both outpatient and inpatient settings. Specialized inpatient bedservice units with acute and subacute intensity levels are available in approximately 60 VAMC sites. The <u>Functional Status and Outcomes Database</u> (FSOD) developed by PM&RS allows rehabilitation programs to track outcomes across the full continuum of rehabilitation care. The FSOD functional measure is based on the Functional Independence Measure (FIM), a valid and reliable disability assessment tool.	Goals 1 and 2. The VACO PM&RS department provides departmental oversight, support, and guidance in the provision of clinical rehabilitation services to veterans receiving care in the VHA. PM&RS is a national leader in the development of a functional outcomes database, performance indicators, and use of clinical guideline. Since stroke represents approximately 25% of all veterans with rehabilitation needs, the stroke QUERI will work closely with PM&RS in all clinical initiatives involving stroke rehabilitation and guideline use.
VISN 8: the Community Care Coordination Service Department (CCCS) Acting Director: P. Ryan	In 2000, the CCCS implemented a program that coordinated the care for veterans with common chronic diseases. A major premise of the model of care is to equip the professional care coordinator with innovative technologies to expand clinical communication into the home so that the chronic disease can be managed across the continuum of care. In March 2003, the CCCS implemented a demonstration project, "The CoaguCare Home INR Monitoring Project". CoaguCare uses the CCCS model so that home INR monitoring technology combined with care coordination can efficiently improve patient safety and improve access to anticoagulation clinic for therapeutic management of veterans who are prescribed Warfarin. This program holds great promise since most patients who are anticoagulated are typically managed through the clinic setting. This scenario could serve as a crucial barrier to accessing appropriate stroke prevention care since many veterans have to travel long distances frequently for their lab work. Veterans had to be diagnosed with one or more of the following conditions to be eligible for the program: mechanical heart valve, atrial fibrillation, embolism, or acute myocardial infarction. This 2-year project will enroll 150 patients and will be divided into two distinct groups. One group will exclusively receive an in-home messaging device, called the Health Buddy, a disease	Dr. Chumbler and his colleagues at the Stroke QUERI to evaluate this data. A basic descriptive evaluation will be performed to explore the circumstances by which the program was found to be useful or not useful. More specifically, we intend to examine the patient level factors that are associated with appropriate and effective anti-coagulation therapy. This information will be informative to better tailor the chronic disease dialogues as well as the anti-coagulation therapy for the veterans with atrial fibrillation so that strokes can be averted.

Collaborators' Name and Affiliation	Collaborator's Projects or Resources Related to Stroke QUERI's Goals	Stroke QUERI's Related Goals and Activities
	management tool from the Health Hero Network, Inc. The second group will exclusively receive the health buddy along with a home INR monitor.	
VA Employee Education System (EES) Donna Schoonover	The EES is the central office education department for the VA to creates and implements continuing education programs for the VHA.	Goal 1. Stroke QUERI with work with EES to monitor the progress and saturation of their newly developed education module directed at increasing clinician knowledge and use of the newly created VHA clinical stroke guideline.
VISN 8: Mental Health Performance Measure Workgroup Chair: M. Llorente Co-Chair: B. Ballot	The Workgroup with representatives from each VAMC in VISON 8 meets via teleconference calls and communicates via emails. They discuss each Mental Health Performance Measure, examine implementation steps at each site, summarize experiences from successful implementations, determine barriers for poor compliant performance, and make recommendations to the VISN for performance improvement.	Goal 4: We will collaborate with the Workgroup in the following activities: 1) to produce a depression-screening module for stroke patients; 2) to measure the performance at each site of the VISN; and 3) to understand the successful experience and barriers in depression screening and management.
VISN 11: Center of Excellence (COE) on Implementing Evidence-Based Practice (CIEBP) Director: Brad Doebbeling	The mission of the Center is to improve healthcare provided to veterans through discovery, evaluation, implementation, and sustained adoption of evidence-based best practices in the VA. Through a focused concentration on categorizing, elucidating and implementing best practices, the proposed Center will advance the science and practice of translational health services research. Our strategic goals include: (1) generate new knowledge about best practices through clinical and organizational research; (2) identify organizational, environmental and provider-based aspects of the VHA that influence adoption of these best practices; (3) design and test health system interventions to support, expand, and sustain the implementation of evidence-based practice in patient care; (4) accelerate the VHA's transformation toward a learning organization making maximal use of research evidence in routine care; (5) facilitate the use of research in the dissemination of best practices.	The QUERI Implementation Research Coordinator (IRC) will be based at the Indianapolis RVA and will work directly with Dr. Williams and Dr. Doebbeling to implement efforts in cerebrovascular disease. Dr. Doebbeling will provide senior leadership in implementation science for the Stroke QUERI, and the growing team of implementation researchers at the Indianapolis RVA HSR&D will ensure a rich scientific and mentoring environment for the Stroke QUERI IRC. We also expect that the joint strength in community-based care and tele-health in VISNs 8 and 11 will provide a rich platform for collaborations using new technologies to improve the quality of stroke care in the VA.

Collaborators' Name and Affiliation	Collaborator's Projects or Resources Related to Stroke QUERI's Goals	Stroke QUERI's Related Goals and Activities
VA Office of Quality and Performance	<p>Objectives of the Performance Measure Program are: 1) Assess the process and outcomes of care provided to patients; 2) Provide an accountability framework for assessing the performance of the leaders, clinicians, and managers in VHA; and 3) Link VA/VHA strategies with accountability measures to support improvement. The VA's OQP maintains a database of items abstracted from VHA medical records as part of its External Peer-Reviewed Program (EPRP). The goal of the EPRP is to provide ongoing monitoring of quality and performance in focused disease areas. One of the focus areas is diabetes. This database includes a wide range of data about clinical care across a broad range of patients in the VA. In FY 2002, about 70,000 records were abstracted which includes approximately 9,000 over sampled diabetic patients. (Note: 6.6% of diabetic veterans have a concomitant diagnosis of stroke.) Approximately 2.4% of VA inpatients are diagnosed with a new stroke annually. We project that this cohort will include chart-abstracted data on 800 (non-diabetic) and 600 (diabetic) stroke patients each year. Our objective is to examine stroke care among veterans with diabetes and without diabetes over a 3.5-year period of time, from September 1, 1999 to March 31, 2003.</p>	<p>Goal 2. QUERI will be developing methods and measures to obtain national estimates for the appropriate mix of rehabilitation services that should be expected to be consumed by groups and subgroups of patients. We will be working with Bonny Collins at the OQP to evaluate and create a potential performance indicator that could be used nationally as an appropriate (and minimal) target for rehabilitation services provision.</p>
VA PROTECT – VISN 1 Project PI: Dawn Bravata	<p>The objective of the VA PROTECT (Protecting Veterans Against Recurrent Stroke) project is to reduce the risk of recurrent stroke, myocardial infarction, and death through increased use of prevention interventions. The primary objective is to determine if an electronic reminder and education prompt can improve the use of stroke preventive interventions upon discharge for veterans hospitalized with acute ischemic stroke. The investigators hypothesize that instituting an electronic education prompt on admission will increase the use of seven secondary stroke prevention interventions at discharge for patients hospitalized with acute ischemic stroke. This project was recently submitted to as part of a VA Center for Research on Patient Focused Care. The VA PROTECT project is proposing an intervention study including 250 veterans hospitalized with acute ischemic stroke within VISN1. The results of this project could serve as a pilot for a larger</p>	<p>Goal 3: Our focus in the Stroke Prevention module of the Stroke QUERI is translating established therapies into practice and reducing the burden of stroke and related diseases. The initial effort will focus on the use of anticoagulation in patients with atrial fibrillation. While this project is underway, we will also be establishing the foundation for second and third generation projects by partnering with investigators and institutions working to reduce the burden of stroke.</p>

Collaborators' Name and Affiliation	Collaborator's Projects or Resources Related to Stroke QUERI's Goals	Stroke QUERI's Related Goals and Activities
	regional or national intervention. Dr. Bravata is the PI for this proposal. She is committed to submitting this as an independent proposal should the larger center proposal not be awarded.	

Non-VA Collaborators

There are a great many efforts underway to improve stroke care in the United States and internationally. For this Stroke QUERI to assess care within a setting in the VHA, with the leadership of Dr. Larry Brass, we will need to make comparisons across VA facilities, VISNs, as well as to external non-VA facilities. We will explore collaborations with the following non-VA programs to help inform the Stroke QUERI:

Develop formal collaboration with Paul Coverdale Stroke Registry of the Centers for Disease Control (CDC).

The CDC are currently piloting a stroke registry in four states (with plans to expand in the coming year). One of the major goals of the registry is to benchmark hospital-based acute stroke care. In addition to acute stroke therapies, such as thrombolytic therapy, the Registry also includes information on medical aspects of stroke care and the initiation of secondary prevention. A collaboration including the sharing of results of baseline data and performance measures would be of great help in planning for VA-based interventions, and would provide a community benchmark for VA hospitals.

If initial work is promising, we would also explore whether it would be useful to have the VHA (or a national sample of centers) included in the registry as a separate, discrete entity (currently the Stroke Registry is organized along state lines). We have made preliminary contact with key personal at the CDC including George Mensah, MD, Director of Cardiovascular Disorders along with Janet Croft and Wendy Wattigney.

Open discussions with Physician Recognition Program at National Center for Quality Assurance (NCQA).

The NCQA recently announced its Physician Heart Stroke Recognition Program (<http://www.ncqa.org/hsrp/>). To encourage improvement in care and build upon favorable experience with the Diabetes Physician Recognition Program (DPRP), The American Heart Association/American Stroke Association (AHA/ASA) and National Committee for Quality Assurance (NCQA) are creating a comparable program to recognize the quality of care provided by physicians for persons who have cardiovascular disease or who have had a stroke. Both Drs.

Brass and Goldstein from this Stroke QUERI participated in the development of this program and the selection of performance measures.

To earn HSRP Recognition, physicians and physician groups will submit data related to areas of care identified by the AHA/ASA and the American College of Cardiology as important for heart or stroke patients. These areas are:

- Blood pressure control (defined as a blood pressure level below 140/90 mm Hg)
- Cholesterol screening (complete lipid profile)
- Cholesterol control (defined as a LDL-cholesterol level below 100 mg/dL)
- Use of aspirin or a antithrombotic medication
- Smoking status documentation and cessation advice or treatment.

Physicians will participate in the HSRP using the Interactive Survey System, a sophisticated online survey platform created by NCQA. The system will allow physicians and physician groups to use a Web-based survey tool to assess their performance prior to applying for recognition. The survey tool provides physicians with a detailed report on their performance, allowing them to identify opportunities for improvement and assess their readiness to seek recognition, before submitting their application online.

This program is based at the level of the primary care clinic. If we are to have an impact in stroke prevention, the primary care clinics must be involved. This is the foundation for medical care in the VHA. It is where most veterans receive their medical care before and after their stroke. Learning from successful programs will greatly increase the chances for successful interventions in the VA. Pilot projects would test whether (and how) the NCQA program could be applied in the VHA setting.

Open discussions with Stroke Center Certification at Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

In 2004, the JCAHO will begin Performance Measurement for Disease-Specific Care Certification. Drs. Duncan, Matchar and Brass from this Stroke QUERI all participated in the Disease-Specific Care Stroke Performance Measure Advisory Panel that developed the

performance measures which will be used

(<http://www.jcaho.org/dscc/performance+measures/stroke+measure+set.htm>). The indicators are listed below:

- STK-1 Screen for Dysphagia
- STK-2 Lipid Profile During Admission
- STK-3 Tissue Plasminogen Activator (t-PA) Considered
- STK-4 Antithrombotic Medication Within 48 Hours of Hospitalization
- STK-5 Deep Vein Thrombosis (DVT) Prophylaxis
- STK-6 Discharged on Antithrombotics
- STK-7 Patients with Atrial Fibrillation Receiving Anticoagulation Therapy
- STK-8 Stroke Education
- STK-9 Smoking Cessation
- STK-10 Rehabilitation

These items are key components of basic stroke care. They should be part of VA care. These items could form the basis for a benchmarking project of VA care for stroke. Many of these measures are important for preventing recurrent ischemic events and enhancing neurological recovery. We will continue to follow this program as it rolls out across the U.S. as a possible model for a project within the VA. It may be appropriate for the QUERI to partner with select VA Centers (with stroke expertise) to apply for stroke center certification as part of a pilot project.

Develop collaboration with American Stroke Association (ASA)/American Heart Association (AHA).

The ASA, a division of the AHA, is one of the major stroke organizations in the world. They are developing a suite of interventions to improve stroke care. These include ‘Get with the Guidelines’ (see below), teaching materials, educational programs, data collection and benchmarking projects, hospital and outpatient-based interventions, and quality of care efforts.

Collaboration with the ASA could, at a minimum, provide a source for ongoing idea and experience with translation projects.

Explore use of ASA's Get with the Guideline's Program in the VHA setting. The ASA has been testing a stroke-specific intervention to test their "Get with the Guidelines" program in post-stroke care. Preliminary results indicate that the program is effective in enhancing the use of guideline specified therapies. There are very few models currently for successful interventions in for prevention specific to the stroke population. The results of this and similar programs will help inform the VA about how to best implement programs that will work in the VA on a veteran population.

If results are robust, and it appears as if this program can be adapted to care of the veteran, the Stroke QUERI may look toward a pilot project to see how "Get with the Guidelines" performs in the VHA. Ellen Magnis, VP of the AHA, has expressed a strong interest in assisting the Stroke QUERI in this effort.

Establish VA presence on Stroke Section Committee of American Academy of Neurology (AAN).

The Prevention Group of the Stroke QUERI would like to establish a core set of relations with professional organizations involved with the care of veterans related to stroke prevention. The AAN is the major professional organization for neurologists in the U. S.. The goal would be to keep veteran's issues and stroke care highly visible within the organization.

Define Memorandum Of Understanding (MOU) for VA and the National Stroke Association and explore potential collaborations.

In 2002, the National Stroke Association and the VA signed a MOU. The Stroke QUERI will review what was included and how this relation can be leveraged to promote prevention efforts in the Stroke QUERI.

Obtain updates/reports from COE for CPRS and VA Protecting Veterans Against Recurrent Stroke (PROTECT) Project.

The objective of the VA PROTECT project is to reduce the risk of recurrent stroke, myocardial infarction, and death through increased use of prevention interventions. The primary objective is to determine if an electronic reminder and education prompt can improve the use of stroke preventive interventions upon discharge for veterans hospitalized with acute ischemic stroke. The investigators hypothesize that instituting an electronic education prompt on admission will increase the use of seven secondary stroke prevention interventions at discharge for patients hospitalized with acute ischemic stroke.

This project was recently submitted to as part of a VA Center for Research on Patient Focused Care. The VA PROTECT project is proposing an intervention study including 250 veterans hospitalized with acute ischemic stroke within VISN 1. The results of this project could serve as a pilot for a larger regional or national intervention. Dr. Bravata is the PI for this proposal. She is committed to submitting this as an independent proposal should the larger center proposal not be awarded.

Biographical Sketches for Stroke QUERI Administration

Pamela W. Duncan

Linda S. Williams

case-management model of evidence-based depression treatment after stroke.

02/01/2002-01/31/2005: Advanced Career Development Award: Veterans Health Administration, Research Career Development Award, "Integrating Health Status and Clinical Data to Improve Stroke Outcomes," Veterans Health Administration, Health Services Research and Development Service.

07/01/02-06/30/2005: Co-investigator: NINDS R01-NS-42078-01. "THIS trial: Treatment of hyperglycemia in stroke." Principal investigator Askiel Bruno, MD, Indiana University. This is a pilot RCT testing acute treatment with IV insulin as an intervention to improve stroke outcome.

10/01/03-03/31/2004: Clinical Coordinator: VA Stroke QUERI (P. Ducan, PhD Research Coordinator). Conditional approval of proposal with six months of funding for Strategic Plan development. \$77,000.

01/2004-07/2004: Co-Principal investigator (P. Woodbridge, MD, MBA co-PI), VISN Implementation Planning Grant. "Implementing evidence in the detection and treatment of post-stroke depression." \$50,000. This planning grant will result in the development of an SDP proposal to utilize existing VA depression performance measures as a tool to improve the detection and treatment of depression in veterans with stroke.

Completed Grants

02/01/1997-06/30/1998: Principal investigator: Regenstrief Institute Postdoctoral Research Award, "Development of a stroke-specific quality of life instrument."

07/01/1998-06/30/2000: Principal investigator: Indiana University Diabetes Research and Training Center Pilot Project, "Aggressive vs. standard treatment of hyperglycemia in acute ischemic stroke."

02/01/1999-01/31/2002: Level I Career Development Award: Veterans Health Administration, Research Career Development Award, "Understanding health-related quality of life after stroke," Veterans Health Administration, Health Services Research and Development Service.

07/1999-06/2002: Co-investigator, R01-NS-38529-1, "Secondary Prevention in Small Subcortical Strokes," PI O. Benevente, FRCP (C), University of Texas Health Science Center at San Antonio.

11/01/2000-10/31/2001: Principal investigator, Eli Lilly, Inc. "Prevalence of mental health and pain disorders in Neurology outpatient clinics."

03/01/2001-03/31/2003: Co-investigator: Indiana University School of Nursing, Center for Enhancing Quality of Life in Chronic Illness. "Quality of Life Among Family Caregivers of Aphasic and Cognitively Impaired Stroke Survivors," (PI T. Bakas, DNS, RN).

01/30/2002-09/30/2002: Principal investigator, Eli Lilly, Inc. "12-month assessments in neurology patients with pain in depression." Prevalence of mental health and pain disorders in Neurology outpatient clinics."

10/01/2002-09/30/2003: Co-investigator: NIA R03 AG021766-01, "Health Domain Importance in the Aging Stroke Patient." Principal investigator JS Swan, MD, Indiana University.

D. Time and Effort Statement

Indicate percentage of time spent on research, clinical, teaching/mentoring, and administration. List persons mentored in last 3 years and type of mentoring awards.

Effort statement:

Research: 75%

Clinical: 10%

Teaching/mentoring: 10%

Administration: 5%

Teresa M. Damush

Britta Neugaard

Resumes of the Executive Committee Members

Ellen Magnis

Ellen Magnis

6214 Misty Trail, Dallas, TX 75248

emagnis@yahoo.com

Cell: 214-284-1006

SUMMARY OF QUALIFICATIONS

Business expertise (with heavy emphasis on strategy, marketing, alliance/corporate development) and entrepreneurial spirit proven by development of medical practices, a healthcare consulting business, a healthcare-focused Internet start-up, and non-profit organization “start-up” division.

Experience in healthcare consulting, e-business consulting, client services, and non-profit management illustrates aptitude to interface with all levels of employees and professionals, expertise in prioritizing multiple demands, and ability to coordinate internal and external resources to satisfy a client / alliance base with high expectations for deliverables.

Strong verbal and written communication skills enhance ability to manage teams, promote process improvements and execute business strategies.

PROFESSIONAL ABILITIES / SKILLS

Relationship Management, Business Development, Strategic and Business Planning, Corporate Relations, Public Relations, Consultative Selling, E-business Consulting, Implementation/Training, Marketing/Internet Marketing Accounting, Project Management, Crisis Management, Problem Solving

EXPERIENCE

Vice President. American Stroke Association, a Division of the American Heart Association (October 2000 – present) Dallas, TX.

Hired as Manager of Strategic Initiatives and advanced to Vice President of Association within 2.5 years. Develop the Association’s business plan/agenda through a collaborative process, providing assistance to integrate stroke initiatives within key functional areas of the American Heart Association and its 13 regional Affiliates. Develop external partnerships (corporate, non-profit and government) to leverage resources and to improve communication/distribution channels. Write position and concept papers, marketing/communications plans and business plans for joint ventures with strategic alliances; organize and lead teams to execute plans. Manage staff/volunteer Advisory Working Groups to develop and/or evaluate new products and to address complex strategic and positioning issues for the Association.

Manage national strategic relationships with agencies in the National Institutes of Health, Centers for Disease Control and Prevention (including state health departments) and multiple medical professional associations. Oversee development of consumer and professional products, publication of a magazine, and all stroke-related marketing/communications activities. Develop sales pitches and make presentations to corporate sponsors. Participate on team to develop and launch a \$90 million public service awareness campaign with the Ad Council. Guide large cross-functional volunteer/staff project teams to research, evaluate and implement programs to influence nationwide systems change in the delivery of stroke care through relationships with national accrediting organizations, requiring extensive consensus-building and introduction of new business models.

Chief Executive Officer. Health IT, Inc. (May 1998 – October 2000) Dallas, TX.

Developed business plan with company founder. Responsible for implementing the plan and introducing product lines: website and database/application development for healthcare organizations. Developed proposals and marketing materials; wrote newsletters and journal articles. Provided leadership for daily business operations, including collaboration with website development team and sales team. Provided consultative selling for large clients (IPAs and hospitals); managed relationships; performed needs analyses and recommended solutions relating to e-business. Managed projects for largest clients.

Overview of specific accomplishments:

Expanded company from one small client to 100+ clients in early adoption stage market, including 1300 physician IPA, and major hospital and medical school clients throughout the southwest.

Created awareness of new company through marketing and public relations efforts: relationship-building, exhibiting at trade shows, public speaking, writing engagements, news releases, collateral material development, monthly broadcast email newsletters and active participation in professional organizations.

Teaching Assistant. The University of Texas at Dallas Executive Programs, School of Management. (1997 – September 1998) Dallas, TX.

Part-time appointment during MBA program. Implemented accounting software solution and provided software training for administrative staff of five executive programs. Provided program support to Director of Alliance for Medical Management Education, a joint venture with UT Southwestern Medical School providing Masters level management education to physicians.

Independent Consultant. Magnis Communications & Consulting (1993 - 1998) Dallas, TX.

Consulted with physicians regarding strategies to streamline office functions. Evaluated and selected computer systems. Trained staff on software: receivables management, billing, insurance, financial reporting, scheduling, patient database and word processing. Subcontracted with CPA firm for crisis management of practices undergoing significant changes due to partnership dissolution or office closures (due to death or malpractice). Audited business practices prior to site inspections.

Medical Practice Administrator. Texas Dermatology Associates (1985 - 1993) Dallas, TX.

Developed (from inception) a multi-million dollar group medical practice with managing partner and administrative team. Coordinated resources for development of satellite offices and integration of new partners. Hired and trained staff; conducted performance appraisals. Led strategic planning and marketing of medical practice.

EDUCATION

M.B.A.	Cohort Program, 1998	University of Texas at Dallas
	Concentration: Organizations & Strategy	
B.A.	Interdisciplinary Studies, 1996	University of Texas at Dallas
	Psychology, Sociology, Research	

HONORS

- Texas Business Hall of Fame Scholarship, 1998 (awarded to one MBA student per Texas business school; competitive scholarship based on entrepreneurial and academic achievement)
- University of Texas at Dallas, Cohort MBA scholarship & Teaching Assistantship, 1997-98
- Magna cum laude, 1996

ACTIVITIES

- Stroke Belt Consortium Executive Committee, 01 – present
- Mentor, University of Texas at Dallas Cohort MBA Program, 01- present
- Award Selection Committee, University of Texas at Dallas School of Management, 01
- One Voice Coalition, American Academy of Neurology, 2000- present
- Human Directory Project, Editor (Database for Internet search engines), 99 – 01
- Health Information Management Systems Society (national HIMSS), member, 99 – 01
- D/FW HIMSS, board member, VP of Publications, 99 - 01
- Doctors Referral Service of North Texas, board member, VP of Marketing, 99 - 00
- Orientation Committee, Chair, 1998: developed Orientation manual for domestic and international students; led 2-day Orientation program
- Entrepreneurial Association, Member, 98
- Student Business Consultant, John C. Ford Program, 98: consulted with low-to-moderate income entrepreneurs on development of business plans and financial statements
- American College of Health Care Executives, member, 98-01

PUBLICATIONS

Recommendations for Improving the Quality of Care through Stroke Centers and Systems: An Examination of Stroke Center Identification Options. *Stroke: Journal of the American Heart Association*, January 2002.

Information Technology: Tools for the Medical Practice, published by the Medical Group Management Association, December 2000.

Harnessing the Power of E-Business: A Guide for the Pharmaceutical Industry, *Financial Times of London Management Report*, January 2000.

Harnessing Internet Tools for Cancer Care, (feature/cover story) *Oncology Issues*, September/October, 1999.

Catching Up on the Internet, *Journal of Administrative Eye Care*, Spring 1999.

PRESENTATIONS (PARTIAL LIST)

JCAHO Stroke Center Certification, Northern Ohio Conference, September 2003.

Overview and Update from the ASA, Western States Stroke Consortium, Seattle, September 2003.

Stroke Center Certification Update, Brain Attack Coalition, January and August 2003.

Update on the American Stroke Association, Stroke Belt Consortium, October 2002.

Non-Profit Division Strategy, National Kidney Cancer Foundation Board Retreat, January 2001.

Update on the American Stroke Association, Stroke Belt Consortium, October 2001.

Harnessing the Power of the Internet in your Medical Practice, Dallas County Medical Society meeting (MedExplore), February 2000.

Building a Web Site for Your Medical Practice, Medical Group Management Association, San Diego, Fall 1999.

Peter Arthur Woodbridge

 Department of Veterans Affairs		RESEARCH AND DEVELOPMENT PROGRAM		INVESTIGATOR'S BIOGRAPHICAL SKETCH <i>(Not to Exceed Four Pages)</i>	
NAME Peter Arthur Woodbridge, MD, MBA			POSITION TITLE Clinical Assistant Professor		
EDUCATION / TRAINING <i>(Begin with Baccalaureate or other initial professional education, such as nursing, and include post-doctoral training. Do not include Honorary Degree.)</i>					
NAME, LOCATION OF INSTITUTION		DEGREE (if applicable)	YEAR AWARDED	FIELD OF STUDY	
Brown University, Providence, RI		BA	1971	Biology	
Brown University, Providence, RI		MMS	1973	Biochemical Pharmacology	
University of Minnesota Medical School, Minneapolis, MN		MD	1975	Medicine	
Clinical Pathology, Department of Laboratory Medicine and Pathology, University of Minnesota Hospitals, Minneapolis, MN		Residency	1979	Pathology	
Health Information Systems, Department of Laboratory Medicine and Pathology, University of Minnesota Hospitals, Minneapolis, MN		Fellowship	1980	Medical Informatics	
Clinical Chemistry, Department of Laboratory Medicine and Pathology, University of Minnesota Hospitals, Minneapolis, MN		Fellowship	1980	Clinical Chemistry	
University of Dallas, Irving, TX		MBA	2000	Healthcare Delivery	
NOTE: The Biographical Sketch may not exceed four pages. Items A and B (together) may not exceed two of the four-pages.					

A. Positions and Honors

(List in chronological order previous positions, concluding with your present position. List any honors, professional memberships or present membership on any Federal Government public advisory committee.)

Positions and Employment:**Instructor,**

Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis, MN

Dates: July 1980 through December 1980

Pathologist and Partner,

Southwest Medical Center Pathology Associates, Dallas, TX

Dates: January 1981 through April 1995

Assistant Professor, Laboratory Medicine and Pathology

University of Texas, Southwestern, Dallas, TX

Dates: March 1982 through December 1998

Chief Operating Officer and Medical Director

OncoGenetics, Inc., Phoenix, AZ

Date: May 1995 through January 1997

Founder, ClinPath Consulting, Inc.

10040 Meadowbrook Lane, Dallas, TX

Dates: February 1997 to September 1998

Physician Executive, Ambulatory Care and Community Based Extended Care

Roudebush VA Medical Center, 1481 West 10th Street, Indianapolis, IN 46202

Dates: September 1998 to present

Clinical Assistant Professor,

Pathology and Laboratory Medicine Sciences, Indiana School of Medicine, 1120 South Drive, Indianapolis, IN 46202

Dates: March 1999 to present

Clinical Assistant Professor,

General Internal Medicine, Indiana School of Medicine, 1120 South Drive, Indianapolis, IN 46202

Dates: July 2002 to present

Other Experience and Professional Memberships:

Fellow, College of American Pathologists

Fellow, American Society of Clinical Pathology

Member, American Medical Informatics Association

Honors:

Bacaner Award for Outstanding Research in Pathobiology, University of Minnesota, 1980

B. Selected peer-reviewed publications (in chronological order)

(Do not include publications submitted or in preparation)

* = HSR&D supported research

Furcht, L.T., Wendelschafer Crabb, G., Mosher, D.F., Arneson, D., Hammerschmidt, D., **Woodbridge, P.A.**, "The role of fibronectin in normal platelet aggregation and demonstration of an inherited disease with defective aggregation correctable with normal fibronectin," *J. Cell. Biol.*, 83(2):61a (1979).

Furcht, L.T., Moser, D.F., Wendelschafer Crabb, G., **Woodbridge, P.A.**, Foidart, J.M., "Dexamethasone induced accumulation of fibronectin and collagen extracellular matrix in transformed cells," *Nature* 277:393 (1979).

Furcht, L.T., Wendelschafer Crabb, G., **Woodbridge, P.A.**, "Cell Surface Changes Accompanying Myoblast Differentiation," *J. Supramolecular Struct.* 7:307 (1977).

Books:

(Contributing Editor), 1989 Year Book of Toxicology, Sunshine, I., Ed., CRC Press Inc., Boca Raton, 1989.

(Contributing Editor), 1990 Year Book of Toxicology, Sunshine, I., Ed., CRC Press Inc., Boca Raton, 1990.

Furcht, L.T., Wendelschafer Crabb, G., Woodbridge, P.A., "Cell Surface Changes and Myoblast Differentiation" in Vol. 23, *Cell Surface Carbohydrates and Biological Recognition*, Marchesi, V.T., Ginsburg, V., Robbin, P.W., Fox, F.C., Eds. Alan Liss, Inc., 1978.

Recent Relevant Abstracts and Short Papers:

*Hopp, F., Lowery, J., Woodbridge, P.A., "Home telemedicine and the VA workforce: Potential and challenges," VA HSR&D Forum, June 2003.

C. Research Support

List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

"Touchscreen Self-care Process Automation CRADA" (PI: P. Woodbridge) The purpose of this project to develop and commercialize a system that 1) facilitates patient self-management and 2) automates routine medical record documentation based on a provisional U.S. patent that was issued for this technology to PI and assigned to the VA.

"An Evaluation of Home-Based Telemedicine Services" (Site PI: P. Woodbridge, Study PI: F. Hopp - Ann Arbor). The purpose of this research is to examine the effectiveness of telemedicine technology in delivering home care services to VA patients.

"Human Factors and the Effectiveness of Computerized Reminders" (Site PI: P. Woodbridge, Study PI: S. Asch - Los Angeles, Study Co-PI: E. Patterson) The purpose of this study is to determine the generalizability of barriers to wide-scale use of clinical reminders previously identified, to modify CPRS reminders based on the findings, and test the effectiveness of the interventions.

"Implementing Evidence in the Detection and Treatment of Post-stroke Depression" (Co-PI: P. Woodbridge, Study PI: Linda Williams – Indianapolis) The purpose of this study is to extend the implementation of existing VA depression screening and treatment guidelines to improve the proportion of veterans screened, diagnosed, and appropriately treated for post-stroke depression.

D. Time and Effort Statement

Indicate percentage of time spent on research, clinical, teaching/mentoring, and administration. List persons mentored in last 3 years and type of mentoring awards.

Based on 60 hour work week:

33% (20 hours) research, 10% (6 hours) clinical, 5% (3 hours) mentoring, 52% (31 hours) administration. Mentored - Scott McGilvrey (New Media Information Sciences Degree); Jess Deskins (Masters in Nursing)

E. Significant Life Events (OPTIONAL)

List any significant life events that have interrupted the PI's research activities for a significant period of time.

Entered private practice of Clinical Pathology and Laboratory Informatics in 1981. Acquired significant biotechnology implementation, medical informatics, healthcare delivery systems, and business management and administrative skills and experience while in private practice.

Joined the Indianapolis VAMC in 1998 with the specific intent of using acquired knowledge and experience to develop, investigate and implement outpatient healthcare delivery systems. Shortly after joining VA, implemented first VA commercial scheduling package to better manage waits and delays. Developed touchscreen applications for patient self-care that resulted in a US patent and VA R&D CRADA. Currently participating in national VA rollout of telehealth technology. Second CRADA submitted to VA R&D for evidence-based medicine enhancements to telehealth technology.

10-1313-3 for Stroke QUERI Research Coordinating Center

10-1313-4 for Stroke QUERI Research Coordinating Center

Stroke QUERI Research Center ESTIMATED EXPENSES OF PROGRAM /PROJECT

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL	147,269	147,269	147,269		
CONSULTANT SERVICES	0	0	0		
EQUIPMENT	85,000	0	0		
SUPPLIES	3,400	1,500	1,500		
ALL OTHER EXPENSES	50,551	59,907	59,907		
TOTAL OPERATING EXPENSES	286,220	208,676	208,676		

Explain differences in the operating expenses between years.

\$85,000 one time equipment expense during year one only.
 \$1,900 for purchase of software and statistical reference manuals, year one only
 Biostatistician FTE will be increased from .15 FTE in year one to .25 in years 2 and 3

JUSTIFICATION OF ITEMS PAGE 3

Personnel

Pamela Duncan, PhD. Dr. Duncan, GS 14/2, (.25 FTE contributed through Research Career Development) will serve as the Research Coordinator of the Stroke QUERI. She is a nationally and internationally recognized expert in stroke rehabilitation and has extensive experience in health services research and outcome assessment. She is the Director of the Rehabilitation Research Outcomes Center of Excellence, the University of Florida Brooks Center for Rehabilitation Studies, and Professor of Health Services Administration at the University of Florida. Working with Dr. Williams, Clinical Coordinator, she will oversee all administrative, educational and dissemination activities of the Stroke QUERI. She will work closely with Dr. Williams, Clinical Coordinator, in leading the efforts of the Stroke QUERI to achieve its mission. She will be responsible for executing and revising the strategic plan. She will also be a national spokeswoman for the Stroke QUERI.

Dean Reker, PhD. Dr. Reker, GS 14/1 (.15 FTE), will be the associate research director. He will lead the Goals 1 and 2 Secondary Prevention project teams. He will be responsible for the oversight of all project activities in Goals 1 and 2 and will assure timely completion of all project activities. Dr. Reker has been a major architect for the RORC Integrated Stroke Database and will lead the Methods and Database Core. Working with Dr. Joo, he will supervise all data collection, management, and analysis for Stroke QUERI.

Britta Neugaard, MPH. Ms. Neugaard, GS 12/3 (1.0 FTE), will serve as the Project Manager. She is currently a project manager at RORC and is also a PhD candidate in health services research at the University of Florida. She will provide administrative support to the Research Coordinator (RC), Clinical Coordinator (CC) and Implementation Research Coordinator (IRC). She will be the point of contact for the Stroke QUERI and will collaborate with other QUERI participants, including QUERI groups, HQ staff, and other VHA divisions. Ms. Neugaard will lead the Dissemination Core and will be responsible for effectively disseminating Stroke QUERI findings. She will participate in the development of study protocols, proposals, technical reports, and assist with manuscript preparation.

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL					
CONSULTANT SERVICES					
EQUIPMENT					
SUPPLIES					
ALL OTHER EXPENSES					
TOTAL OPERATING EXPENSES					

Explain differences in the operating expenses between years.

JUSTIFICATION OF ITEMS PAGE 3

Diane Cowper, MA. Ms. Cowper, GS 13/7 (.10 FTE), will serve on the Methods and Database and Dissemination Cores. As a former co-Director of the VA Information Resource Center, she will serve as the data consultant to all components of the proposed research. Ms. Cowper will assist Drs. Reker and Joo in identifying VA administrative data sets that can be used to answer questions posed in the QUERI strategic plan, as well as identify potential gaps in information that needs to be collected. Additionally, she will lend her knowledge and expertise of Geographic Information Systems (GIS) to map variations in treatment practice. Ms. Cowper will also work with the administrative core to disseminate findings from Stroke QUERI initiatives. Ms. Cowper will also collaborate closely with VIREC representatives to assure data needs of the Stroke QUERI are met.

Program Assistant, TBN, GS 6/1 (1.0 FTE). The program assistant will assist the Project Manager in preparing all QUERI deliverables for dissemination and will respond to requests for Stroke QUERI products. The program assistant will provide administrative support to the investigators and will schedule conference calls, arrange travel, and coordinate the Stroke QUERI Executive Committee Meetings. The program assistant will also serve as a research assistant for specific core activities (such as chart review, literature searches, planning of focus groups, recruitment of subjects).

Huanguang Jia, PhD (.30 FTE, contributed). Dr. Jia is currently a Research Health Scientist at the Rehabilitation Outcomes Research Center. He has expertise in the area of rehabilitation utilization, quality of life, and health services research. Dr. Jia will serve on the Methods and Database Core. He will provide expertise to the group in management of depression in non-VA stroke patients. Dr. Jia has experience in project management and will also assist the Project Manager, Research Coordinator, and Clinical Coordinator in the administration of the Stroke QUERI.

Neale Chumbler, PhD (.10 FTE, contributed). Dr. Chumbler is a research health scientist at the Rehabilitation Outcomes Research Center and is an assistant professor in the Department of Health Services Administration at the University of Florida. Over the last 10 years, his research has identified and evaluated effective strategies by which to deliver accessible health care services and to improve patient centered outcomes for frail non-institutionalized older adults. Specifically, his current agenda consists of implementing and evaluating care coordination models, which are enhanced by home-telehealth technologies for veterans with disabling, chronic diseases to improve patient centered outcomes (e.g., health related quality of life), avert preventable health services, and assist informal caregivers. Dr. Chumbler is a member of the Translation, Implementation, and Evaluation Core, and will be the liaison between the Stroke QUERI and Community Care Coordination Service (CCCS) on joint projects.

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL					
CONSULTANT SERVICES					
EQUIPMENT					
SUPPLIES					
ALL OTHER EXPENSES					
TOTAL OPERATING EXPENSES					

Explain differences in the operating expenses between years.

JUSTIFICATION OF ITEMS PAGE 3

Christopher Johnson, PhD (.10 FTE, contributed). Dr. Johnson is a Research Health Scientist at the Rehabilitation Outcomes Research Center. He will serve on the Translation, Implementation, and Evaluation Core. He will provide the Core expertise in the area of how organizations impact structure, process, outcomes in stroke care. He will work with the Implementation Research Coordinator and other investigators to develop interventions targeted at the organizational level.

Doug Ried, PhD (.10 FTE, contributed). Dr. Ried will serve on the Translation, Implementation, and Evaluation Core. His interests are in studying the relationship between drug use and patient health outcomes and mental health. He has extensive experience in administering large-scale surveys and in studying patients' quality-of-life outcomes. He will be an investigator for Goal 4 and will evaluate with Dr. Williams the development of the VISNs 11 and 8 Implementation Project.

Kristen Wing, BA (.10 FTE, contributed). Ms. Wing will serve as the Stroke QUERI Webmaster. She will be responsible for maintaining and updating the website as necessary.

Equipment

One copier is required (\$10,00) to accommodate the additional copier needs. One fax machine for electronic communications will be purchased (\$800) and two laptop computers for investigator use during travel (\$2,600). One color printer and cartridges are required to print specialized graphics (\$3,600). Five work stations (1 office and 4 cubicles) are required to accommodate new hires (\$20,200). One network server to store QUERI data complete with SAS network software and 5 computers will be required (\$42,000). Server routers, service, and connectivity will be required for the server (\$2,000). One laser printer for the network is required (\$2,000). Two single licenses Nvivo software (\$1,800) are required for qualitative data analysis.

Supplies

We have budgeted \$1,500 per year for supplies to operate the Research Coordinating Center. The supplies necessary include writing paper, writing implements, miscellaneous office supplies, computer paper, printer ribbons, storage media, miscellaneous computer supplies, and publication costs. We have budgeted for \$1,900 in year one for software reference manuals (SAS, Nvivo, Web software).

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL					
CONSULTANT SERVICES					
EQUIPMENT					
SUPPLIES					
ALL OTHER EXPENSES					
TOTAL OPERATING EXPENSES					

Explain differences in the operating expenses between years.

JUSTIFICATION OF ITEMS PAGE 3

All Other Expenses

Yongsung Joo, PhD, service contract (.15 FTE), is a Health Research Scientist at the Rehabilitation Outcomes Research Center and Assistant Professor in Biostatistics at the University of Florida. He will serve as the Biostatistician and will develop and supervise analytic strategies for variation in practice and evaluation of effectiveness of implementation strategies. Dr. Joo's efforts will increase in years 2 and 3 to .25 FTE.

Xinping Wang, PhD, service contract (.50 FTE), will be responsible for all data acquisition, data management, data cleaning, and will perform all SAS programming to support the data analysis for each QUERI program.

10-1313-3 for Stroke QUERI Clinical Coordinating Center

CURRENT FUNDS AND FIRST YEAR REQUEST FOR PROGRAM PROJECT

PRINCIPAL INVESTIGATOR(S) WILLIAMS, Linda S., The Indianapolis Richard L. Roudebush VA Medical Center (RVA) Indianapolis, Indiana				
TITLE OF PROGRAM/PROJECT Stroke QUERI Clinical Coordinating Center				
PERSONNEL	ROLE IN PROGRAM	% EFFORT	CURRENT YEAR FUNDS	FIRST YEAR REQUESTED FUNDS
Linda Williams, MD	Clinical Research Coordinator (GS 15/10)	30	0	contrib.
Theresa Damush, PhD	Implementation Research Coordinator (GS 13/4)	75	0	72,150
TBN	Program Assistant (GS 7/1)	100	0	44,223
Marita Tittler, RN, PhD	Senior Implementation Advisor	5		7,425
Bradley Doebbling, MD, MSc	Investigator	5	0	contrib.
William Jones, MD	Investigator	10	0	contrib.
		TOTAL	0	\$ 123,798
CONSULTANT SERVICES			\$ 0	\$ 0
EQUIPMENT (Justify any item over \$3,000 on VA Form 10-1313-4)				
Computers (3) @ \$1,500 each				4,500
Laptop Computers , 2 @ \$2,500 each				5,000
3 PDA's @ \$350 each (Dell Axim Xei)				1,050
Software and licenses				2,000
Web-based Survey Software (1 each)				1,400
Projector Dell 2200 MP (1 each)				1,000
		TOTAL		14,950
SUPPLIES (Itemize)				
Writing paper, writing implements, miscellaneous office supplies, computer paper, printer ribbons, storage media, miscellaneous computer supplies, publication costs.			0	2,000
		TOTAL	\$ 0	\$ 2,000
ALL OTHER EXPENSES (Itemize)				
PSD Focus Groups				8,500
Ada Young, MHA	Data manager (Service Contract, .30 FTE)			14,520
		TOTAL	\$ 0	\$ 23,020
TOTAL OPERATING EXPENSES			\$ 0	\$ 163,768

10-1313-4 for Stroke QUERI Clinical Coordinating Center

Stroke QUERI Clinical Coordinating Center ESTIMATED EXPENSES OF PROGRAM /PROJECT

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL	123,798	123,798	123,798		
CONSULTANT SERVICES	0	0	0		
EQUIPMENT	14,950	1,000	1,000		
SUPPLIES	2,000	2,000	2,000		
ALL OTHER EXPENSES	23,020	14,520	14,520		
TOTAL OPERATING EXPENSES	163,768	141,318	141,318		

Explain differences in the operating expenses between years.
 \$14,950 one time equipment expense during year one only.
 \$8,500 for focus groups year 1 only.

JUSTIFICATION OF ITEMS PAGE 3

Personnel

Linda Williams, MD. Dr. Williams, GS 15/10 (.30 FTE) will serve as the Clinical Coordinator and will lead all QUERI activities at the Indianapolis Roudebush VAMC (RVA). She brings expertise in intervention and implementation research, patient-centered implementation of best evidence, depression research in patients with neurologic disease, and quantitative measurement. She is the PI of a 4-year NIH-funded study of nurse case-management to implement best evidence in post-stroke depression treatment. She recently was awarded an Implementation Planning Grant to develop an intervention to improve detection and treatment of veterans with PSD. She will supervise and collaborate with Dr. Damush on all QUERI implementation activities and will direct the PSD focus. She will be a member of the Operations Committee, the Translation, Implementation and Evaluation Core, the Goal 2: Secondary Prevention Team. She will work closely with Dr. Duncan to set the QUERI research agenda, communicate with other QUERI investigators and groups, and ensure the timely evaluation and dissemination of QUERI activities and findings.

Teresa Damush, PhD. Dr. Damush, GS 13/4 (.75 FTE) will serve as the Implementation Research Coordinator. She is currently an Assistant Professor at IU School of Medicine, and a Research Scientist at the Regenstrief Institute and the IU Center for Aging Research. She will lead the Translation, Implementation, and Evaluation Core, participate in monthly conference calls with all working groups to ensure progress on implementation of research in each major clinical area, will be a member of the Operations and Committee and Dissemination Core, and will lead the development of a Stroke QUERI newsletter. She will work closely with the Project Manager in Gainesville to disseminate QUERI findings and generate reports and respond to requests. Dr. Damush is an experienced implementation researcher who conducts research aimed at improving patients' evidence-based self-management of common geriatric conditions. She brings expertise in utilizing stages of change and other theories in developing and testing interventions. She has experience conducting and analyzing qualitative research. She is collaborating with Dr. Williams on an internally-funded pilot project to examine management of stroke risk factors in African Americans with recent stroke.

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL					
CONSULTANT SERVICES					
EQUIPMENT					
SUPPLIES					
ALL OTHER EXPENSES					
TOTAL OPERATING EXPENSES					

Explain differences in the operating expenses between years.

JUSTIFICATION OF ITEMS PAGE 3

Marita Titler, PhD, RN. Dr. Titler (.05 FTE) will serve as the senior implementation advisor to the Stroke QUERI. She will work with Dr. Damush, Dr. Doebbeling, and other QUERI investigators to plan formative evaluation studies and multidisciplinary Phase I/II implementation projects. Dr. Titler is currently Director of Research, Quality and Outcomes Management, Department of Nursing Services and Patient Care, Director of Research Dissemination Core, Gerontological Nursing Intervention Research Center, and Clinical Professor of Nursing, University of Iowa. She is one of the country's leading translational researchers, whose well-funded program of research focuses on multidisciplinary interventions and involvement of clinicians and managers to improve best practices. She and Dr. Doebbeling have collaborated on a number of research, teaching, and administrative initiatives, including serving on the NINR Geriatric Nursing Interventions Research Center's Translational Interventions Core (which she directs) and in planning a AHRQ-funded national translational research meeting. Dr. Titler is in the final stages of negotiation for a joint position with the RVA and the Indiana University School of Nursing that includes an offer of a 5/8th VA senior nursing HSRD researcher position at RVA. Regardless of her eventual location, she has agreed to continue to actively collaborate with Dr. Damush and Stroke QUERI investigators on projects developing from this initiative.

TBN, Program Assistant, GS 7/I (1.0 FTE) will work closely with Drs. Williams and Damush to support QUERI formative evaluations and data collection in VISN 11, conduct literature searches, and organize communications between Indianapolis and Gainesville team members. Specifically, in the first year the program assistant will perform chart reviews in VISN 11 to validate the case ascertainment algorithm for identifying patients with PSD, and will also assist in the planning, scheduling and recruitment of subjects for the PSD focus groups to explore patient and provider perceived barriers to evidence-based PSD detection and treatment. The program assistant will also provide support for VISN 11 data collection and reporting in other clinical conditions of interest, as identified and prioritized by the QUERI Operations Committee.

Bradley Doebbling, MD, MSc (.05 FTE, contributed). Dr. Doebbling will be a member of the Translation, Implementation, and Evaluation Core. Dr. Doebbling will provide leadership in developing new tools and methods for translating research into practice. He will coordinate efforts of the TIEC core to identify barriers to best practices and work with the Implementation Research Coordinator and investigators on the TIEC to design and test health system intervention to support implementation of evidence-based practice in stroke care.

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL					
CONSULTANT SERVICES					
EQUIPMENT					
SUPPLIES					
ALL OTHER EXPENSES					
TOTAL OPERATING EXPENSES					

Explain differences in the operating expenses between years.

JUSTIFICATION OF ITEMS PAGE 3

William Jones, PhD (.10 FTE, contributed). Dr. Jones is a Research Career Development Award recipient. He will work with the Goal 4 Team to develop interventions to improve best practices in depression management and with the Goal 2 Secondary Prevention team. His Award (CDA) focus on stroke risk prediction and runs through 6/06.

Equipment

We request support for 3 PCs (\$4,500 total) and 3 PDAs (\$1,050 total) for the Clinical Coordinator, Implementation Research Coordinator, and Program Assistant. We also request 2 laptop computers for the CC and IRC to facilitate their work during travel for VA and QUERI meetings (\$5,000 total). We request \$1,400 for web-based survey development software to support the development of survey tools to enhance the collection of data for implementation formative evaluation projects from clinicians, researchers, and managers in VISN 8 and 11. We request \$1,000 for a projector to facilitate dissemination of QUERI activities to key leaders, clinicians, and researchers in VISN 11 and at QUERI and other VA meetings. We request \$2,000 in year 1 and \$1,000 per year in Years 2 and 3 for general software support and licenses (e.g. Microsoft Office, SAS, SPSS, reference manager software).

Supplies

We request \$2,000 per year for supplies including copying, mailing, and general office supplies at the RVA.

All Other Expenses

We request \$8,500 in Year 1 to conduct focus groups of stroke survivors and providers (primary care, neurology, psychiatry, PM&R) to identify barriers and facilitators to providing evidence-based detection and treatment of PSD. Focus group participants will be drawn from VISN 11 facilities. These data will be used to develop the PSD implementation project in Year 2.

Stroke QUERI Clinical Coordinating Center

ESTIMATED EXPENSES OF PROGRAM

/PROJECT

DESCRIPTION	\$ AMOUNT EACH YEAR				
	1ST	2ND	3RD	4TH	5TH
PERSONNEL					
CONSULTANT SERVICES					
EQUIPMENT					
SUPPLIES					
ALL OTHER EXPENSES					
TOTAL OPERATING EXPENSES					

Explain differences in the operating expenses between years.

JUSTIFICATION OF ITEMS PAGE 3

Ada Yeung, MHA, service contract (.30 FTE) will serve as the Data Manager at the Clinical Coordinating Center. Ms. Yeung is currently a data manager for the RVA HSR&D division. She is familiar with extracting and manipulating VA, Medicare, and Regenstrief Medical Record System data. She will be responsible for data queries in VISN 11 to support QUERI activities. In Year 1, she will extract VISN 11 data on patterns of follow-up and PSD diagnosis and will report to Dr. Reker and other QUERI investigators and data managers in extracting and communicating other VISN 11 data needed to meet QUERI objectives. Ms. Yeung is currently an Indiana University employee but is located at the RVA; we will support her on a service contract until she can be transferred to a full-time VA position.

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Appendices

Appendix A: Rehabilitation Outcomes Research Center (RORC)

RORC Executive Summary

Established on October 1, 2001, the Rehabilitation Outcomes Research Center for Veterans with Central Nervous System Damage (RORC) has a relatively brief but productive history. In sixteen months, the RORC Director has assembled a team of outstanding investigators who are building collaborative relationships with other VA investigators and across Centers to maximize the capacity for rehabilitation outcomes research. RORC investigators have leveraged core Center funds to increase the VA funded research portfolio to \$1.4 million. Center investigators also have attained extramural funds in excess of \$2 million. In addition, a commitment to career development has been established which will allow us to train future rehabilitation outcomes researchers. The scope of work in the Rehabilitation Outcomes Research Center's strategic plan is significant to the mission of the Department of Veteran Affairs. Our outcomes research program is well defined but not narrowly focused. The Integrated Stroke Outcomes Database (ISOD) will provide an invaluable resource for many investigators to assess structure, process and outcomes of stroke care in the VA. In addition, we have expanded our goals and access to data (Nursing Home Minimal Data Set) to evaluate rehabilitation services provided to individuals in nursing homes. We are employing state-of-the-art methods to refine outcome measurement so that we may more clearly define the consequences of stroke and other disabling conditions across the continuum of care. The development of a stroke rehabilitation policy model will inform us about the utility of various interventions and the values of different stroke related health states. State-of-the-art qualitative research methods are being used to examine the effectiveness and efficiency of emerging therapies in CNS rehabilitation and to develop knowledge related to psychosocial and quality of life aspects of recovery and care giving. As we develop, our scope of research is expanding relative to the primary objectives outlined in our original proposal. A major expansion has occurred in the area of evaluation of assistive technologies and telehome health care for individuals with low activities of daily living and chronic disease. Finally, our planned development of a Stroke QUERI will ensure that research results will be considered and translated into clinical practice. The support from VISN 8 and the North Florida/South Georgia Veterans Health System leadership has made, and will continue to make, our joint HSR&D/RR&D Center a successful enterprise.

The overall mission of the Rehabilitation Outcomes Research Center (RORC) for Veterans With Central Nervous System Damage (CNS) is to enhance access, quality, and efficiency of rehabilitation services through interdisciplinary research and dissemination activities. As we develop, our scope of work is expanding relative to the primary objectives outlined in our original proposal. For example, a major expansion in the first sixteen months has been in the area of assistive technologies and tele-home health care.

There are seven major goals that the RORC Core investigators and Operations Committee have established for the Strategic Plan time period. These goals are aligned with four Research Focus Areas and two Cores (Methodology, Career Development). The research focus areas are:

- Evaluating, developing, and integrating clinical and administrative data to evaluate structure, process, and outcomes of rehabilitation services
- Advancing outcome measurement in CNS damage and rehabilitation
- Examining psychosocial aspects of recovery and caregiving
- Evaluating assistive technologies and tele-homecare to improve independence and quality of life

GOAL 1: Conduct studies that will help to explain and guide improvements in the design, administration, management, and access to rehabilitation services, as well as model costs of changes in disability states attributable to rehabilitation.

There is currently tremendous variability in the structure and process of rehabilitation services in VA facilities. Despite demonstrated efficacy, veterans have limited access to organized rehabilitation unit care and despite converging evidence that stroke outcomes are improved with well organized multidisciplinary teams, the number of rehabilitation beds in the VA has shown a marked decline over the past several years. Despite some recent advances in management of acute stroke (thrombolytic therapy) there are no widely applicable therapies to reverse neurological damage.

Therefore, it is essential that these patients receive the most appropriate rehabilitation care to enhance their recovery, minimize disability and improve quality of life. However, there are few studies that have evaluated the most cost-effective ways to organize and provide care or evaluate specific interventions to restore function and minimize disability. Over the next five years, RORC researchers will attempt to fill the void in this area of investigation.

5-year initiatives and plans: A major goal of Research Focus Area 1 is to continue to enhance the development of an integrated information system to assess rehabilitation outcomes for stroke patients. Access to this database, updated annually, and the expertise of the data management team will be a key resource for VA quality improvement initiatives, rational planning for rehabilitation services, research, training and dissemination activities. Over the next 5 years, RORC investigators will: 1) integrate SF36V, pharmacy, prosthetics and Medicare data into the database to capture veterans' full spectrum of health care utilization; and 2) provide a valid and reliable research database: a) to evaluate access and examine variations in services across the VA Health Care System, b) to evaluate, using the Duke Stroke Policy Model, rehabilitation interventions and differences in cost for various levels of disability, and c) to assess relationships between structure process and outcomes of rehabilitation services for CNS-damaged-veterans. Nursing home data from both the community and the VA will be tapped to examine the structure and process of rehabilitation services and their effects on quality outcomes of VA stroke patients. The ISOD will be a valuable resource for the investigators interested in the area of Stroke.

To support our research goals, we will continue to actively submit investigator-initiated proposals. An example of our productivity is that we have 5 submissions in preparation for FY2003-FY2004 for this focus area. We will continue to expand our

capacity by recruiting postdoctoral investigators and candidates for Career Development Awards. We plan to recruit one additional senior-level investigator in FY2004. We also will recruit a physician health services researcher and a junior-level epidemiologist/health services researcher to support the Goal 1 objectives.

GOAL 2: Use the ICF (International Classification of Functioning, Disability, and Health) framework, item response theory methodologies, and our experience in development of specific outcome measures to advance measurement in rehabilitation.

In general, outcome measurement in rehabilitation has failed to keep pace with changes and innovations in rehabilitation practice and research. In addition, there has not been a consistent endorsement of a disability model for measuring outcomes. We will use the World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICF) model for measuring outcomes. Item Response Theory and computerized adaptive testing methodologies will be used to create precise and efficient measures that are consistent with the ICF model.

In both the VA and Non-VA Sector there is no consistency in outcome measurement for functional outcomes. For example, rehabilitation units use the Functional Independence Measure (FIM), while nursing homes use the Minimum Data Set (MDS). To evaluate outcomes, we need to develop conversion tools to link measures across the continuum of care, e.g., connecting the FIM in rehabilitation centers and the MDS in skilled nursing facilities.

In some areas of rehabilitation, we need to develop new measures. For example, studies should be designed to support the development of cognitive measures in areas that are almost completely lacking (e.g., efficient/ comprehensive cognition screens for stroke patients and brain trauma) and for spinal cord injured patients with low mobility. Finally, an outcome measurement agenda needs to define "clinical meaningful" change.

5-year initiatives and plans: The overall goal of this focus in the RORC is to use the ICF framework, item response theory methodologies, and our experience in development of specific outcome measures to advance measurement in rehabilitation and functional status of veterans. RORC investigators will use existing work and collaborations to employ computerized adaptive testing methodologies to create measures of functional and cognitive status

that are precise and efficient. We are developing a collaborative relationship with Boston University's Rehabilitation Research Training Center to validate and implement a state of the art computerized rehabilitation outcome measurement system in the VA. Second, we will continue the testing and development of a stroke-specific outcome measure, the Stroke Impact Scale (SIS). The SIS demonstrates good reliability, validity and sensitivity to change. Furthermore, the initial IRT analysis of the SIS provides much of the fundamental statistical work necessary to convert this instrument into a computerized adaptive format. We will compare different modes of administration of the SIS, costs of care associated with different SIS scores and characterize clinically meaningful changes in the SIS. The third area that investigators will pursue is linking instruments to facilitate measurement of outcomes across the continuum of care. Linking instruments will address the critical problem of monitoring outcomes across the continuum of care. We will extend the initial work of Williams et al (1997) in developing a FIM-MDS "crosswalk," through the application of IRT methodologies. We will then apply the methods used to develop a FIM-MDS crosswalk to evaluate functional status of individuals who are transferred from VA rehabilitation facilities to nursing home care.

The fourth area of collaboration will be with ongoing and new outcome research studies. For example, we will develop patient centered outcomes that are clinically meaningful in chronic pain patients and test an item bank of performance measures for spinal cord injury patients who use a wheelchair for mobility.

To continue to support our research goals we have in review 2 proposals to RR&D and 1 proposal to National Center for Rehabilitation Research, 1 approval from HSR&D to submit a service directed project and we are submitting a career development application for a UF faculty member to evaluate and develop items to assess the participation domain of the ICF. We are also actively recruiting one additional health services researcher with measurement expertise. We have plans to develop several research proposals in the next two years, one specifically to develop an applied cognitive measure for brain trauma.

GOAL 3: Examine psychosocial aspects and ethnic and cultural variations of recovery and caregiving and evaluate newly emerging therapies and technologies in rehabilitation.

Quantitative approaches to rehabilitation outcome studies can never capture the complexity of human experience, social life, or ethnic and cultural aspects of rehabilitation. Qualitative methods provide some of our most important tools in understanding the complexities of disability in its social context. Qualitative methods are important for developing new knowledge about rehabilitation and ethnic and cultural variations in recovery, access to care, and use of resources. Combining qualitative and quantitative methods is still in its infancy and RORC researchers are at the forefront in developing effective methods to accomplish combined approaches to develop new understandings about rehabilitation.

This initiative brings together interdisciplinary teams of leading researchers in the areas of rehabilitation and social scientists to develop knowledge about the psychosocial aspects of recovery and rehabilitation and to determine ethnic and cultural patterns of recovery and caregiving. To support the evaluation of emerging therapies, there are several innovative treatments that enhance recovery and minimize disability. Evaluation of many of the new innovative interventions and uses of assistive technology and tele-homecare are lead by University of Florida and VA investigators. The psychosocial and cultural factors that may affect compliance with these interventions are rarely evaluated. The benefits of the interventions may be limited to reduction in symptoms but may not be generalizable to activities or participation in social and physical roles within the context of patients' real world.

5-year initiatives and plans: The overall goal of this initiative is to use the ICF framework, combine qualitative and quantitative data, use existing data for secondary analyses and seek funding to develop new knowledge in rehabilitation including ethnic and cultural variations. Further, we will work closely with the BRRC to study the experience of patients and caregivers participating in new therapies being developed in the BRRC. We will pursue four objectives: (1) conduct studies that will help explain psychosocial aspects and ethnic and cultural patterns of recovery and caregiving from patient and caregiver perspectives; (2) conduct studies on patient and caregiver experiences during newly emerging therapies; (3) conduct studies using qualitative methods to validate and improve outcome measures such as functional status, depression and

participation; and (4) conduct studies to reduce caregiver burden.

To support our research goals, we will complete three studies that are currently funded. We will also conduct secondary analyses of existing data and develop five new proposals and one Career Development Award application for additional funding to support this initiative. We will recruit one additional qualitative investigator and develop productive linkages with the University of Florida College of Nursing faculty to recruit doctoral students in nursing and other social sciences to work with us.

GOAL 4: Develop and evaluate assistive technologies and tele-homecare strategies to improve independence and quality of life and reduce unnecessary health care interventions for veterans with functional impairment resulting from chronic diseases and central nervous system damage.

Assistive technologies and tele-homecare has vast potential to improve both patient and system level outcomes, especially by improving access, efficiency, and continuity of care. Assistive technologies and tele-homecare is being used in VHA to move the care of patients with chronic diseases from a predominantly hospital-based site toward the home. While it promises to increase the access of veteran patients to high quality care, convincing evidence to support its use is lacking and no definitive national, or international standard setting body has endorsed tele-homecare standards and guidelines. Due to the expansion of veteran entitlements, enrollment of older veterans with very complex health problems has increased significantly, thereby causing the cost of health care to rise dramatically. Studies need to be designed to: 1) support the development and evaluation of assistive technologies and tele-homecare strategies to improve patient centered outcomes for older adults with functional impairment, resulting from various chronic diseases and central nervous system damage, and 2) identify and evaluate effective strategies by which to deliver cost effective, accessible and appropriate health services for functionally and cognitively impaired seniors. RORC investigators need to work closely with policymakers and clinicians at VISN-8, VA Central Office, the health services research community, and NIH in an attempt to apply assistive technologies and tele-homecare advances to improving the quality of care for veterans.

5-year initiatives and plans: The overall goal of this initiative is to develop assistive technologies and

tele-homecare strategies that improve functional independence, reduce unnecessary hospital admissions/clinic visits and travel to/from health care facilities, and improve the overall quality of life for veterans. In this area we will pursue the following objectives: (1) Collaborate with the National Institute on Disability and Rehabilitation Research (NIDRR) Rehabilitation Engineering Research Center on Technology for Successful Aging (RERC-Tech-Aging) to design methods that can be tested in large clinical trials in preparation for translating new therapies and technologies into clinical practice. With the recruitment of Dr. William Mann, a nationally recognized expert in assistive technologies and Director of the NIDRR/RERC-Tech-Aging, we will continue to expand our goals to evaluate the utility of assistive technologies to keep elders in their homes. We have received additional funds from VISN-8 to support these projects to assess the effectiveness of the assistive technology on functional outcomes and utilization. RORC investigators will continue to explore VISN-8 priorities in this area; (2) Initiate a collaborative research and development program with the Chief Consultant of the VHA Telemedicine Strategic Health Care Group, the National Cancer Institute (NCI), the National Institute of Standards and Technology (NIST), a branch of the U.S. Department of Commerce, and the VISN-8 Community Care Coordination Service to develop and test an evidence-based model for tele-homecare with cancer patients called *Advancing Cancer Care Through Technology* (ACCTT). The ACCTT program will link to the VHA's quality initiatives, the NCI and NIST to provide methodologies and avenues to disseminate ACCTT to the other health care organizations in both the private and federal sectors; (3) Execute a new clinical demonstration project funded by VISN-8 that addresses the needs of veterans with activities of daily living dependence through the use of home monitoring and communications technology. This intervention model will then be expanded to be applicable specifically to stroke patients. In addition we will explore the patient-healthcare provider relationship to determine, from the patient's perspective, to what extent they are fragmented from their healthcare provider so that health care practices can be better tailored to meet patient expectations of care; (4) Present an independent evaluation of clinical outcomes of the VISN-8 Community Care Coordination Service demonstration projects. This initiative will follow from the ongoing program evaluator role to provide the VISN-8 decision makers with the necessary data to determine, at a population-level, the appropriateness and cost effectiveness of the

innovation and home health strategies; and (5) Maintain the lead program evaluator role on a multi-VISN project (MVP) originating from Under Secretary for Health's (USH) office based on data collected on veterans and their functional outcomes (functional independence and health services use) at five different VISN sites (VISNs 1, 2, 8, 11, and 17). The program evaluation will determine the effectiveness of care management and technology innovation as used by these projects on veteran patients at their residence. We will also work closely with the Chief Consultant for Telemedicine at VACO to identify outcome and performance monitor measures as well as a data collection methodology.

To support our research goals, we will continue to actively submit investigator-initiated research proposals. An example of our productivity is that we have two submissions in preparation for FY2003-FY2004 for this focus area. We will continue to expand our capacity by supporting a Career Development application for a MPH-trained physician. With the expansion of our funded research grants, we will recruit both a health services researcher and a statistician to support our Goal 4 objectives.

GOAL 5: Provide methodological support in statistics, database design and development, economics, psychometrics, and qualitative methods to researchers at the RORC/BRRC.

Members of the RORC/BRRC methodology core provide specialized services to the RORC research foci and the Brain Rehabilitation Research Center (BRRC) in areas such as statistical analysis, experimental design, power calculations, cost measurement, quality of life measurement, software development, survey instrument design and database management. At the present time, the Methodology Core consists of health economists, a psychometrician, a programmer, two bio-statisticians, a rehabilitation health services researcher and a qualitative methodologist.

5-year initiatives and plans To continue to support the methodological requirements of RORC investigators, we actively monitor the staffing of our methodological core. In the presence of a rapidly growing Center, we will have an ongoing program to evaluate these needs. For example, we have an ongoing recruitment for a .5 PhD-level statistician and another database manager.

Goal 6: Enhance capacity for rehabilitation outcomes research through our Career Development Program.

There is a limited pool of researchers who are dedicated to the evaluation of rehabilitation. A primary objective of the RORC is to train the next generation of rehabilitation researchers. We are using two strategies to accomplish this goal. The first is that we have recruited, and will continue to recruit, traditional rehabilitation students and providers and trained them in the methods of health services research. Second, we recruit researchers from related field and health services research and train them in the substantive area of rehabilitation. We are committed to the recruitment of minority investigators and investigators with disability.

5-year initiatives and plans. As part of our 5-year strategy, we will build on our existing programs to develop education and training strategies for the next generation of rehabilitation researchers. We will continue our aggressive recruitment of highly qualified applicants. Our plans will be to continue to support 6 to 8 graduate students each year, 1 to 3 pre-doctoral awardees, 2 post-doctoral fellows, 2 to 3 Career Development Awards, and we will use the Associate Investigator program to support new investigators. We will continue to use the Research Experience Award and the Disability Supplement programs to recruit minority and disabled applicants for career development.

To support our Career Development program, we will continue to use our successful recruitment strategies, expand our training activities, and recruit senior investigator to mentor new and/or junior staff. We will assign a .5 support person to assist Dr. Rittman with the administration of this program.

GOAL 7: Build capacity for rehabilitation outcomes research

Rehabilitation research is not a mature area and there are few accomplished rehabilitation outcome researchers. It is important to build research capacity by developing collaborations with other Center Investigators. For example, the Bedford Center of Excellence has expertise in case-mix adjustment but little rehabilitation experience. We merged the talents of the RORC with the Bedford Center to submit a proposal to develop risk adjustments in rehabilitation outcomes. We have submitted three other similar collaborative proposals for funding to Rehabilitation Research and Development. We will continue to network with other Centers to develop collaborative research proposals.

RORC 2003 Annual Report

**2003 Annual Report
Rehabilitation Outcomes Research Center
A Center of Excellence
Gainesville, FL
HFP 01-124**

Pamela W. Duncan, PhD, FAPTA, Director

The Rehabilitation Outcomes Research Center for Veterans with Central Nervous System Damage (RORC) was established on October 1, 2001 as the first combined VA Health Services Research and Development/Rehabilitation Research and Development Center of Excellence. There is tremendous variability in the structure and processes of rehabilitation services in the VA. In addition there is very little evidence to support the clinical and cost-effectiveness of rehabilitation intervention and services. The RORC research programs are evaluating the clinical and cost-effectiveness of rehabilitation interventions to ultimately improve quality of care and provide evidence for informed decision-making about provision of rehabilitation services. Development of best outcomes measures is critical to evaluation of rehabilitation services.

The overall mission of the RORC is to enhance access, quality, and efficiency of rehabilitation services through interdisciplinary research and dissemination activities. There are four research areas where RORC investigators are focused: (1) Evaluating, developing, and integrating clinical and administrative data to evaluate structure, process, and outcomes of rehabilitation services; (2) Advancing outcome measurement in CNS damage and rehabilitation; (3) Examining psychosocial aspects of recovery and caregiving; and (4) Evaluating assistive technologies and tele-homecare to improve independence and quality of life.

There are seven major goals that the RORC Core investigators and Operations Committee have established. These goals are aligned with four Research Focus Areas and two Cores (Methodology, Career Development).

GOAL 1: Conduct studies that will help to explain and guide improvements in the design, administration, management, and access to rehabilitation services, as well as model costs of changes in disability states attributable to rehabilitation.

GOAL 2: Use the ICF (International Classification of Functioning, Disability, and Health) framework, item response theory methodologies, and our experience in development of specific outcome measures to advance measurement in rehabilitation.

GOAL 3: Examine psychosocial aspects and ethnic and cultural variations of recovery and caregiving and evaluate newly emerging therapies and technologies in rehabilitation.

GOAL 4: Develop and evaluate assistive technologies and tele-homecare strategies to improve independence and quality of life and reduce unnecessary health care interventions for veterans with functional impairment resulting from chronic diseases and central nervous system damage.

GOAL 5: Provide methodological support in statistics, database design and development, economics, psychometrics, and qualitative methods to researchers at the RORC/BRRRC.

GOAL 6: Enhance capacity for rehabilitation outcomes research through our Career Development Program.

GOAL 7: Build capacity for rehabilitation outcomes research

Investigators

In the second year of operation, we continued to recruit additional investigators and staff to support and expand the mission of the RORC. During the year we have recruited a new core investigator, Dr. Ried, to the RORC to develop a research program in pharmacology, depression, and stroke. We have hired and continue to expand our administrative support for the RORC. We currently have 64 staff members. This number includes 17 core investigators, 9 core staff, 15 project staff, 2 post-doc trainees, and 4 pre-doctoral trainees. We also have 17 affiliate investigators from the University of Florida collaborating with the RORC programs.

The RORC is a unique Center of Excellence in that both Health Services Research and Development and Rehabilitation Research and Development contribute funds. Given these different funding sources, our strategies for development are atypical of other HSR&D centers. Rehabilitation research is not a mature area and there are few accomplished rehabilitation outcome researchers. A primary goal of Rehabilitation Research and Development services is to expand capacity for rehabilitation research by supporting collaborations with investigators across VA Centers. We have built capacity for rehabilitation research with collaborative funded projects with Drs. Dean Reker at the Kansas City VA, Shirley Fitzgerald at the Pittsburgh VA COE, Dan Berlowitz at the HSR&D COE in Bedford, and Julie Fineman at the VA Medical Center in Bronx, NY.

Our new core and affiliate investigators include senior, mid-career, and junior researchers representing health service research, pharmacy, health policy and biostatistics. We are currently recruiting physician health service researchers and an epidemiologist to support the RORC mission. In July, 2003 Dr. Steve Nadeau, the Associate Director of the RORC, became the new Associate Director of the Brain Rehabilitation Research Center. We are in the midst of a national search for a new Associate Director (physician) for the RORC.

Center Funding

Our initial FY03 funding included \$247,035 for core support and \$100,000 in supplemental support from HSR&D and \$304,000 core support from RR&D. In addition to the core Center funding, the annual VA funded research and training portfolio at the RORC is \$2,373,470. We received \$562,778 from Health Services Research and Development; \$786,241 from

Rehabilitation Research and Development; \$122,055 from Medical Research; \$755,884 for VISN related demonstration and evaluation projects in for core funding; as well as \$146,512 from the Office of Academic Affiliations for our training programs.

Center investigators also have annual extramural funds totaling \$3,004,234. This amount reflects funding from a number of sources including: the Public Health Trust of Miami Dade, the National Institutes on Health, National Institute for Disability Rehabilitation Research, National Center for Medical Rehabilitation Research and Center for Disease Control and National Institute for Nursing Research, Robert Wood Johnson, State of Florida and State of Texas Department of Health and Human Services.

We already have two additional VA HSR&D projects funded for FY04, and are submitting 3 HSR&D proposals for the November 1, 2003 deadline and 2 proposals for the RR&D November 10, 2003 deadline.

Research Projects

The research agenda for the RORC is a high priority for the Department of Veteran Affairs. Stroke is prevalent in the VA and has a major impact on functional status. It is the primary condition requiring inpatient rehabilitation services and there is tremendous variability in the structure and processes of rehabilitation services in the VA system. Despite some recent advances in management of acute stroke, there are no widely applicable therapies to reverse neurological damage. Therefore it is essential that patients receive the most appropriate rehabilitation services and interventions. We also need studies that evaluate the most cost-effective ways to organize and to provide stroke care.

We expanded our research foci last year to include the evaluation of access, utilization, and benefits of assistive technology in elderly veterans, including those with stroke. The VA spends millions of dollars on assistive technology to improve function. Yet, very little is known about access to technology or the benefits of these technologies.

Currently, RORC investigators are working on projects to 1) examine population level effects of stroke rehabilitation services, 2) evaluate the relationships between structure, process and outcomes of stroke rehabilitation, 3) assess utilization of community based nursing home for rehabilitation, 4) use VA databases to assess disability states and associated health care utilization patterns, 5) develop new stroke specific outcome measures and assessing different methods of acquiring outcomes data, 6) describe stroke recovery and the influences of ethnic diversity, and 7) determine the appropriateness and cost-effectiveness of the assistive technology for homebound veterans.

Finally, a major source of our work in the past year focused on the creation of the FY01 Integrated Stroke Outcomes Database (ISOD), which includes data from the Functional Status Outcome Database (FSOD), VA Medical SAS Datasets, HERC and DSS cost databases, and the National Veterans Survey. We continue to work with the VA Central Office staff to increase the capture rate of individuals post-stroke in the FSOD. Since the capture rate of stroke patients in

the FSOD is now a quality performance measure, RORC investigators also monitor the capture rate trends and produce maps for PM&R in Central Office on a quarterly basis.

Research Products and Dissemination

There are a number of vehicles by which the RORC communicates the products and results of research conducted by investigators at the Center. The RORC Web Site, a quarterly RORC Newsletter, articles in peer-viewed journals, as well as regional and national presentations, are all mechanisms used by the RORC to convey findings and results of Center projects. During FY03, RORC investigators made 94 presentations at various conferences and national meetings, reflecting a 240% increase over the number of presentations made in our first year (FY02).

The RORC Web site contains information on the mission of the RORC, a list of investigators, publications, projects, and useful links pertaining to stroke are easily accessible by investigators and other individuals interested in the current state-of-the-art in stroke rehabilitation research. A quarterly RORC Newsletter is sent to the research and university communities highlighting the activities of the RORC, introducing investigators and their projects, and listing current publications and new grants.

Over this Fiscal Year, RORC investigators published 71 peer reviewed journal articles, 6 books and 6 book chapters. Peer-reviewed articles have appeared in a number of journals including: *Annals of Epidemiology*, *Archives of Physical Medicine and Rehabilitation*, *Archives of Neurology*, *Health Care Financing Review*, *International Journal of Rehabilitation Research*, *Journal of Applied Gerontology*, *Journal of Pain*, *Journal of Gerontology*, *Journal of Rehabilitation Research and Development*, *Health Care Management Review*, *Medical Care*, *Medical Anthropology*, *Neurology*, and *Stroke*, to name a few. In addition, we have submitted 28 abstracts to the 2004 R&D annual meeting.

Our first RORC project was completed this fiscal year. Diane Cowper finished the *VA Health Care Atlas FY-2000* and, pending approval from the VHA Privacy Officer, will begin to distribute this unique product to the field.

National and Regional Leadership

RORC investigators are active in a diverse group of professional organizations. Examples of professional society affiliations include the *American Geriatrics Society*, *American Physical Therapy Association*, *American Sociological Association*, *American College of Physicians*, *Academy of Management*, *Health Care Management Division*, *American Pharmaceutical Association*, *Academy for Health Services Research and Health Policy*, *American Economic Association*, and *Health Economics Research Organization*, *American Academy of Physical Medicine and Rehabilitation*, *American Academy of Physiatrists*, and *American Public Health Association*, *American Heart Association*, *American Nurses Association*, *American Association of Colleges of Pharmacies*, *University of Florida Health Science Center Institutional Review Board*, *VISN 8 Strategic Planning Committee for Community Care Coordination Service*, *VHA Communication Research's Communications Advisory Board* and the *American Stroke Association*. RORC investigators serve these organizations in many capacities, including

memberships on executive committees, board of directors, and public policy, strategic planning and guideline committees.

Our contributions to the Department of Veterans Affairs this past year were numerous. RORC investigators served on the Department of Defense and on VA committees that developed an evidence-based, post-acute stroke guideline model. Dr. Duncan was on the steering committee to develop these guidelines. Dr. Dean Reker serves on the national Functional Status Outcomes Data steering committee. Diane Cowper is a member of the VHA Research Communications Advisory Board, Drs. William Mann and Neale Chumbler are advisors to VISN 8 on an evaluation of the cost-effectiveness of assistive technology and coordinated care management for elderly veterans with low activities of daily living skills. Outside of VA, Dr. Pamela Duncan is a member of the subcommittee to develop quality indicators for stroke at the American Heart Association, a member of the Executive Leadership Committee for the American Stroke Association, a member of the Long-Range Planning Steering Committee for the National Institute on Disability Rehabilitation Research, and a member of the Canadian Stroke Network Advisory panel. Dr. Leslie Gonzalez-Roth is a member of the Ad Hoc Committee on Practice Guidelines for Speech-Language Pathologists Working with Individuals with Aphasia and a member of the Committee on Clinical Practice Guidelines for the American Speech-Language and Hearing Association. Dr. Stephen Nadeau is a member of the Scientific Program Committee for the International Neuropsychological Society. Dr. Maude Rittman is a member of the Board of Directors at the University of Florida College of Nursing Biophysical Research Center, as well as a member of the Foundation Board of Directors for the Nurses Organization Veterans Affairs and Chair of the Nursing Research Committee.

Training Activities

Dr. Maude Rittman is Assistant Director for the Career Development Program. Our Career Development Program has expanded in resources devoted to the program as recommended last year. We have a .5 FTEE Program Assistant working with Dr. Rittman. One of our investigators, Charles Jia, Ph.D., assists in our training program by coordinating the monthly research seminars and planning bi-weekly brown bag research discussion groups. We have been successful in increasing the number of trainees we currently support in the RORC. This past year, we had three pre-doctoral fellows funded through the Office of Academic Affairs (OAA) and have two currently funded for FY04. We have two postdoctoral fellows funded through HSR&D. We have one Associate Investigator, one HSR&D Career Development awardee, and one HSR&D Merit Review Entry Program awardee. In addition, we have one minority investigator and two minority students working with our research teams. We have 1 individual with disability funded in our pre-doctoral training program who is continuing to work with an ongoing research project. One African-American Ph.D. student funded by the University of Florida is doing his dissertation research on the Effects of Facility Variation on the Outcomes of Stroke Patients in the Veterans Health System. We have one Ph.D. student funded under the VA's Research Experience for Minorities Project.

Non-VA Training Programs: William Mann, PhD is the Director of a training program sponsored by the National Institute on Disability and Rehabilitation Research. Three post-doctoral fellows are currently funded and all are actively engaged in research.

Another University training program, where Dr. Pamela Duncan serves as the Co-Director, is the Interdisciplinary Training and Neuromuscular Plasticity Center. There are currently three predoctoral students currently funded.

Plans for FY04

One of our greatest assets has been the overwhelming support from our Network Director, Dr. Elwood Headley and the North Florida/South Georgia Veterans Health System Director, Fred Malphurs. Specifically, they have provided space as we continue to expand. This fiscal year, we have been given a new 10,000 square foot space and expect to relocate to this new building in early 2004.

For FY04, a major goal of the RORC is to enhance the Integrated Stroke Outcomes Database system for assessing rehabilitation outcomes for stroke patients. Access to this database and the expertise of the data management team is a key resource for VA quality improvement initiatives, rational planning for rehabilitation services, research, training and dissemination activities. We currently have one study with a collaborative team in Bedford using the ISOD and we will continue to work with researchers across the country using these data. We will use the international classification of disability framework, item response theory methodologies, and our experience in development of specific outcome measures to advance measurement in rehabilitation. We will continue to link the BRRRC and RORC interdisciplinary teams of rehabilitation investigators, health services researchers, and social scientists to examine the feasibility of translating innovative therapies and technologies into clinical practice and to guide development of future effectiveness studies. Initial studies will pave the way for incorporating global health outcome measures into economic evaluations associated with large clinical trials that test these emerging interventions and technologies. And finally, we will continue to expand and develop our research agendas to evaluate assistive technologies and tele-home care.

The RORC responded to HSR&D's solicitation for applications to establish a Stroke QUERI and submitted the proposal in May, 2003. The review panel recommended that the RORC be given a conditional approval and recommended that bridge funding for six months be given to allow the RORC support and time to submit a strategic plan in January, 2004. We plan to meet this deadline and hope to receive continuing support for QUERI activities. A Stroke QUERI would ensure that research results will be considered and translated into clinical practice and would contribute to our expanding network of stroke and rehabilitation researchers by involving researchers from West Haven and Indianapolis, as well as strengthen our ongoing relationships with researchers in Durham and Kansas City.

We will continue to be dedicated to a solid and expanding Career Development and Training Program. The overall goal of the Career Development and Training Program is to enhance capacities to support rehabilitation outcomes research training and career development activities. Finally, we will continue to build capacity by recruiting new investigators and a new Associate Director.

Appendix B: Information Management for Patient-Centered Treatment

Both clinicians and patients desire high quality health care. However, their goals are often discordant. Although both are interested in enhancing patient survival and avoidance of adverse events, clinicians often focus on the processes of care (i.e., doing the right thing for their patients) while patients are often more interested in their personal outcomes of care (e.g., how they feel, live, and perform daily tasks). To merge these discordant goals of health care, the HSR&D service of the Roudebush VAMC has created a program called **IMPACT: Information Management for Patient-Centered Treatment**. IMPACT's mission is to help the VHA improve its health care delivery systems to enhance patient-centered outcomes (e.g., health status, quality of life, satisfaction with care). IMPACT's research theme is to develop and test tools obtain, manage, and use these data, with the ultimate goal of improving patient-centered care and its outcomes.

IMPACT will achieve its goal with three primary foci: (1) collecting patient-centered information as part of routine care using effective methods and valid instruments; (2) integrating clinical and patient-centered information into a comprehensive electronic medical record system, and (3) improving patient-centered outcomes by developing and testing interventions for selected conditions (e.g. heart disease, cancer, diabetes, and stroke). IMPACT will address the following key health services research issues: (a) adapt and validate patient-centered assessment tools to use with veterans; (b) test alternative methods for administering these tools during routine ongoing care; (c) store and manage patient-centered data in a comprehensive electronic medical record system; (d) use meta-analysis, decision analysis, and clinical epidemiology to develop testing and treatment guidelines, reduce medical errors, and assess veterans' risk of adverse clinical events and poor outcomes; and (e) develop and test innovative methods to summarize and present these data to clinicians and ultimately improve clinical and patient-centered outcomes.

IMPACT has strong leadership in research skills and productivity. Its Director, Dr. Tierney, is a national leader in the application and testing of medical informatics innovations. Currently-funded VA investigators include Drs. Tierney, Imperiale, Williams, Rutan, and Kirkman. In addition, Dr. McHorney, a long-time VA researcher and one of the world's leaders in developing, testing, and implementing patient-centered assessment tools, will join the Roudebush VAMC in July. IMPACT has strong institutional ties to the Regenstrief Institute, the Indiana University Center for Aging Research, IU Center for Health Services Research, IU Bioethics Center, an NIH-funded Diabetes Research and Training Center, and the School of Liberal Arts. Through these affiliations, IMPACT can capitalize on talented investigators and research opportunities. REAP funds will be leveraged to expand the local research resources. IMPACT is strongly supported by the new leadership at the Roudebush VAMC which is committed to the growth and development of the HSR&D Service as a featured component of its dual missions of providing high quality care and performing ground-breaking, yet practical, patient-centered research.

During the five years of REAP funding, IMPACT will (1) increase HSR&D research capacity at the Roudebush VAMC by maintaining current investigators and core staff, recruiting new investigators and staff, and facilitating collaborations with its academic partner organizations; (2) provide training and mentoring of young investigators to enhance their productivity and career

development; (3) support pilot projects in the three primary foci; and (4) contribute to the research mission of HSR&D nationally and the health care mission of the VHA. REAP funds will help the Roudebush HSR&D service attract and retain VA researchers and in provide them with support in computer systems and scarce research skills, especially biostatistics, health economics, and the development of tools for patient and clinician educational interventions and decision support.

IMPACT will add value to HSR&D and the VHA. The patient-centered tools and methods for their routine administration will be widely useful to assess veterans. Integrating these data into an electronic record system will provide resources to develop and broadly implement guidelines and interventions to improve the quality of care and its outcomes. Methods for intervening to improve patient-centered outcomes will be broadly applicable in the VHA as information technology becomes disseminated.

Appendix C: Implementing Evidence-Based Practice (CIEBP)

Executive Summary

The U.S. healthcare system suffers from variations in practice, unacceptably high rates of medical errors, major gaps between evidence and practice, and suboptimal quality. Much is known about best practices, yet few have been translated or implemented.¹ With the costs of health care now at 15% of the Gross National Product, the translation from evidence to practice has become imperative.

The Indianapolis Richard L. Roudebush VA Medical Center (RVA), in collaboration with the Regenstrief Institute, the Indiana University School of Medicine (IUSM), the Indiana University-Purdue University in Indianapolis (IUPUI), and Purdue University, propose to establish the VA Center of Excellence on Implementing Evidence-Based Practice (CIEBP) in VISN 11.

Mission and Goals: The mission of the Center is **to improve healthcare provided to veterans through discovery, evaluation, implementation, and sustained adoption of evidence-based best practices in the VA and the broader national health care system.** Creation of the proposed Center will complement the research capacity in existing HSR&D Centers of Excellence (COE). Moreover, it will also enhance VHA's capacity to implement and sustain evidence-based practices. Through a focused concentration on categorizing, elucidating and implementing best practices, the proposed Center will advance the science and practice of translational research. Over the next five years, the Center will become a national resource for VA researchers and managers interested in learning about translating evidence into practice.

To achieve this mission, the proposed Center has the following goals:

- 1) Generate new knowledge about best practices through clinical and organizational research;
- 2) Identify organizational, environmental and provider-based aspects of the VHA that influence adoption of these best practices;
- 3) Design and test health system interventions to support, expand, and sustain the implementation of evidence-based practice in patient care;
- 4) Accelerate the VHA's transformation toward a learning organization making maximal use of research evidence in routine care;
- 5) Facilitate the use of research in the dissemination of best practices.

By creatively linking the critical resources cultivated by the funding of our HSR&D REAP on Information Management for Patient Care (IMPACT), we are well-positioned to serve as a national resource for assuring that VHA's investment in promulgating research evidence into high quality routine care is successful. The arrival of Dr. Doebbeling on campus to lead IMPACT has galvanized substantial support and forged new multidisciplinary partnerships between HSR&D and affiliated investigators to focus our unique spheres of expertise on improving the health care of our veterans. The faculty involved and their collaborative relationships are the foundation and the greatest strength of our proposed Center.

Brad Doebbeling, MD, MSc will be the Director of the proposed Center and Linda Williams, MD will be the Deputy Director. They lead an active partnership between a large VA Medical Center, its multiple community-based outpatient clinics, referring VAMCs and its academic affiliates. They bring to bear complementary and synergistic strengths in key health services research modalities: macro-, meso-, and microsystem organization, implementation interventions, and decision support, medical informatics, clinical epidemiology, medical sociology, psychometrics, research on aging, and quantitative and qualitative data analysis. Supportive local VA and University leadership will be provided by a Steering Committee, Research Review Committee, and Executive Committee, with external scientific strategic planning and input provided by a National Advisory Panel.

Areas of Special Research Focus: We define implementation research as the discovery of effective ways to implement evidence-based practices (EBP), either through observation, experimentation, or related empiric or analytic approaches. Through the study of practice variation at the national and regional level, and ongoing natural experiments, we will develop an effective infrastructure to support the adoption of best practices and to actively monitor progress throughout the VHA system. This infrastructure will serve not only as an early detection system for unwanted practice variation, but also as an engine for discovery of organizational and process attributes of sites that are high performers. Through detailed study of specific practice variations and best practices within systems, we will learn how best to implement EBP. We propose to create both a local and national continuous improvement learning network dedicated to the exchange of innovations in implementing EBP. In this context, two areas of special research focus for our proposed Center are described below:

1) Identifying best clinical and implementation practices (Focus 1). In every medical care delivery system, continuous change (in available resources, personnel, population need/demand, organizational and clinical policy) influences the process and outcomes of care. We will study such “natural experiments” in VHA to identify variations in the structure, process, and outcomes of care over time and place and identify best practices. Our prior work studying organizational factors in VHA has already demonstrated the feasibility of such surveillance. When important variation is discovered in EBPs of interest, we will assemble research teams to collaborate with identified VAMCs who are particularly successful. Research teams will employ a multi-method approach, such as structured interviews and observation to evaluate practices. Focus 1 investigators will apply extant knowledge and our experience to conduct detailed ecological analyses to identify additional specific determinants of best practices and synthesize recommendations for implementation planning in the VHA system.

2) Designing and testing health systems interventions in evidence-based practice (Focus 2). Informed by our prior research, we will then develop and test theory-driven health systems interventions designed to improve the quality of care through organizational change. To conduct these trials, we propose to develop a rapid response network of VA primary care centers within VISN 11 to serve as an alpha site ‘testbed’ for “fast-tracking” the planning, conduct, and sharing of results from practice improvement trials. This will promptly test hypotheses involving factors that facilitate successful implementation of best practices. This practice-based implementation research network (PBIRN) will ensure that EBPs are implemented and tested in routine VA practices and that successes are effectively communicated to support implementation throughout the VA.

To create synergy with other VA initiatives and enhance the implementation infrastructure, we will build on our present linkages with the Quality Enhancement Research Initiative (QUERI) groups, the National Clinical Practice Guidelines Council (NCPGC), and key VACO offices.

We propose to annually bring together implementation coordinators, interested VISN Quality Managers, and opinion leaders to learn from and share best practices. We will also focus on dissemination of project results back to key local managers and clinicians, and develop web-based courses to enhance accessibility to knowledge of methods and tools of EBP implementation.

In this proposal, we review past research and accomplishments that demonstrate the breadth and depth of our expertise in implementation research. We underscore the importance of CIEBP funding in enhancing and expanding the collective strengths represented by our faculty and our established connections to key entities throughout VHA. To demonstrate how we will achieve our goals and focus our initial research efforts, we briefly describe three core research projects. These projects highlight issues related to the dissemination of new technology within VHA, the collection and use of clinical data, and the implementation of EBPs within VHA. Specifically, our initial research agenda includes a project to identify variation in the roll-out and implementation of new computer reminders nationally (Focus 1), an investigation of the use of ambulatory pain data in primary care (Focus 1 and 2), and an implementation research project to improve the identification and treatment of post-stroke depression (Focus 2). These planned research projects reflect the goals of the Center by addressing key questions that define best practices, understand the role of organizational and clinical factors in facilitating adoption, and identify the best ways to design and implement interventions and sustain best practice.

Unique Strengths of the Proposed Center: The proposed COE builds on the substantial experience and expertise in healthcare systems research of our VAMC and affiliates. We have extensive experience in developing and testing translational interventions in hospital, clinic and community settings. Our investigators have also established and currently manage a practice-based research network (PBRN). RVA HSR&D investigators direct VISN 11 care coordination (telehealth) infrastructure and so have ample expertise to provide a rich portfolio of ongoing experiments using innovative technology for Quality Improvement (QI) efforts. The close collaboration between our Center and the emerging Stroke QUERI to be based jointly at the RVA and the VA Rehabilitation Outcomes Research Center of Excellence in Gainesville exemplifies the extent of our expert pool and resources in implementation.

A resource unique to our Center is the long history of successful collaboration of the RVA with the Regenstrief Institute, a pre-eminent center for medical informatics and health services research. Our programs are nationally recognized for success in EBP through system-level interventions. Perhaps the most notable example is in QI through information technology (IT). Other expertise includes geriatric health services research, organizational behavior, changing provider and patient behavior, provider-patient communication, primary care-based QI, and measurement science.

We believe the proposed Center has several other important and unique strengths:

- The research theme and foci build upon our substantial previous work in this area and extend our experience to address issues of particular relevance to the VHA;
- A leadership with career interests and complementary expertise in translation and a strong track record of research and service to VA in implementation research and career development;
- An appropriately skilled faculty of well-funded, senior health services researchers, experienced VA managers, and promising junior investigators;
- Extensive experience in conducting trials of system-based QI interventions;

- Demonstrated effective integration of multidisciplinary investigators and resources through combined leadership for health services research activities on campus;
- Ability to enhance the faculty through a proven history of active partnering with our academic affiliates to jointly recruit and support new faculty based at our COE;
- Immediate outlets for our training mission through our established (VA, NLM, and NIH-funded) training programs in informatics and health services research.

Resource commitments by our VAMC, VISN, and affiliates, contingent upon Center funding, provide important opportunities for synergy in building our VA health services research capabilities at the RVA.

The operational plans for our Center to support our mission and goals are to:

- Establish an organizational structure to ensure that Center research is relevant to VA patient care, resources and activities are managed efficiently, and that the products of research can be effectively integrated with medical practice and policy within VISN11 and the VHA.
- Activate the nascent core research infrastructure to help investigators initiate, conduct, and disseminate relevant research.
- Provide a framework for communication and interaction to promote collaboration among investigators and affiliates, including bi-weekly research conferences, monthly Research Review Committee meetings, triennial Steering Committee meetings, and liaisons to related centers and programs. Implementing a Web site, electronic newsletter and other communication vehicles will be a means of interaction and source of information for investigators, trainees, and users of research.
- Stimulate pilot projects or feasibility studies that can lead to competitive proposals for extramural support of larger studies.
- Develop and support new implementation investigators, though local and distant mentoring of fellows and junior faculty with relevant research interests.

Expected Center products include:

a research portfolio of strategic studies in key areas to inform local, regional, and national EBP; (2) an organizational data system for evidence-based practice (ODEP); (3) a practice-based implementation research network (PBIRN) to develop and evaluate new practices; (4) dissemination and educational tools to enhance implementation training for VA managers and clinicians; (5) an ideal training environment for new investigators whose research agenda focuses on implementation science; and (6) a model infrastructure to encourage and support collaboration at all levels.

Appendix D: The THINRS

Study Abstract for CSP #481 (THINRS)

The CSP study is a trial of the clinical impact of Patient Self-Testing (PST) of prothrombin time by international normalized ration (PT-INR or INR) with weekly testing compared to high quality anticoagulation management (HQACM) with conventional monthly testing.

The rationale for this study is as follows:

- Warfarin is a frequently indicated medication that has been shown to be highly effective in reducing high-morbidity, life-threatening, expensive events.
- Warfarin is a “narrow therapeutic index” drug; that deviations from target PT INR on the low side is associated with dramatic decreases in effectiveness in reducing thromboembolism, and on the high side with dramatic increases in risk of major bleeding.
- Even in anticoagulation clinics patients are frequently out of therapeutic range, phase II type studies suggest that patient using home PT INR monitors have improved time in therapeutic range and decreased thromboembolism rates.
- There is great interest and significant skepticism about the use of home INR monitors, and substantial uncertainty about specifics of their use including patient selection and optimal frequency of testing.
- In addition to the potential health benefits of improved administration of warfarin through PST, there are potential opportunities to improve patient access to care, empowerment, and satisfaction, as well as significant cost savings through the prevention of high-cost events (e.g., stroke costs approximately \$100,000).
- The private sector is not likely to initiate a definitive study of PST.

The proposed study is designed to definitively address the crucial clinical issues related to the use of PST. Sites will be VA Medical Centers with anticoagulation services (ACSs) with active rosters of more than 400 patients. This study will include subjects with atrial fibrillation (AF) and/or mechanical heart valve (MHV) who are expected to be anticoagulated indefinitely. The study will have two parts. Part 1 is a lead-in in which potential and consenting candidates for PST will be evaluated over a 2-week period for their ability to use the home monitoring devices. In Part 2, individuals capable of performing PST will be randomized (after separate consent) to one of two groups:

- HQACM with testing every 4 weeks and as indicated for out of range values, medications/clinical changes, or
- PST with testing every week and as indicated for out of range values, medications/clinical changes.

PST will involve the use of INR monitoring devices that are FDA approved for home use. The primary outcomes will be event rates, defined as the percent of patients who have a stroke, major bleed, or die. The secondary outcomes measures will be total time in range (TTR) (without and with adjustment for projected event risk), other events (myocardial infarction (MI), non-stroke thromboembolism (TE), minor bleeds), competence and compliance with PST, ability to make dosing decisions, satisfaction, and AC associated quality of life (QOL). Sites have yet to be determined, but will have to fulfill certain requirements to be eligible for participation.

To assess the relationship between frequency of testing on outcomes, a substudy is proposed in which several sites will be randomized to 4 arms:

- HQACM with testing every 4 weeks and as indicated for out of range values, medication/clinical changes,
- PST with testing every 4 weeks and as indicated for out of range values, medication/clinical changes,
- PST with testing every week as indicated for out of range values, medication/clinical changes, or
- PST with testing twice a week and as indicated for out of range values, medication/clinical changes.

The two additional arms (PST with testing every 4 weeks and PST with testing twice a week) will remain open until 100 patients (a sample size sufficient to assess the impact of frequency on TTR) have been enrolled in each. Note that the substudy is proposed to start at the beginning of the main study so that if CSP #481 terminates early due to the results of interim analysis, there will be sufficient data to assess the impact of PST frequency on clinically important improvements in quality of AC as measured by TTR.

The study design includes one year of patient accrual and a minimum of two years of follow-up with those enrolled early in the study being followed for up to three years. The study will involve 3200 patients and (approximately) 32 sites.

Appendix E: Implementing evidence in the detection and treatment of post-stroke depression.

Co-Principal Investigators: Linda S. Williams, MD, and Peter Woodbridge, MD, MBA.

Background. At least 11,000 veterans have a stroke each year. Post-stroke depression (PSD) occurs in 25-40% of ischemic stroke survivors and is associated with worse functional outcomes and increased post-stroke mortality.¹⁻⁵ Although effective treatments for PSD exist,⁶⁻⁹ studies suggest that PSD is often underdiagnosed and undertreated.¹⁰⁻¹³ Improving the detection and treatment of PSD is a key focus for the recently proposed VA Stroke QUERI (Conditional approval 10/03). Dr. Williams is the Stroke QUERI Clinical Coordinator and directs the PSD focus of the Stroke QUERI.

Evidence-based practice for PSD. Four randomized controlled studies have suggested that treatment with an antidepressant can improve depression symptoms in patients with PSD.⁶⁻⁹ There is no evidence that PSD is substantially different than depression in patients with other chronic medical conditions, and thus no evidence that best practices for PSD should differ from best practices for non-stroke related depression. The VHA, the American Heart Association, and the American Academy of Neurology have all identified PSD detection and treatment as a quality indicator for best stroke practice.

Depression detection and treatment in the VA. Considerable variation in depression screening and follow-up in the VA has been documented. Recent VISN 11 data show that yearly depression screening is achieved in 83%-93% of veterans in primary care (target 87%), but that follow-up for a positive screen occurs in only 51%-87% (target 85%). Follow-up within six weeks of a positive screen (a recommended performance measure) occurred in 30%-68% and follow-up of a new depression diagnosis in only 7%-39%. Further, a recent 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, black race, and treatment exclusively in primary care associated with inadequate depression care.¹⁴

PSD detection and treatment (Pilot data from VISNs 8 and 11). A chart review study of more than 200 veterans with ischemic stroke at the Indianapolis VAMC demonstrated several important findings:¹⁰ 1) depression was diagnosed in only 14% of veterans in the first three years after stroke, even when outpatient diagnoses and written physician notes were examined, and 2) the proportion of veterans on an adequate antidepressant dose ranged from 96% of veterans that received a selective serotonin uptake inhibitor to only 22% who received a tricyclic antidepressant. Pilot data from VISN 8 show that PSD is undertreated, with 20% of patients prescribed an antidepressant after stroke receiving only a single prescription.¹⁵

There are many theoretical reasons why detection and treatment of PSD may be even more challenging than non-stroke-related depression, including physical barriers to follow-up, attribution of symptoms to stroke rather than depression, focus on stroke-specific medical care,

fragmentation of care after stroke, and lack of awareness of the depression performance measure by non-primary care providers. In our proposed project, we plan to first investigate these barriers and then design an implementation strategy to address them, using the existing VA depression performance measure as a basis for the implementation.

Proposed Project. We propose to develop a project in VISNs 8 and 11 to extend the implementation of the existing primary care depression performance measure to improve the screening, diagnosis, and appropriate treatment of PSD. In a 24-month project, at least 480 veterans would be eligible and 120-192 would screen positive for PSD during the six months post-stroke. Including two VISNs is important both for sample size and for demonstrating generalizability of the implementation.

Study aims.

- a. Identify patient, provider, and system barriers to PSD detection and treatment.
- a. Develop a multidisciplinary implementation strategy to adapt the existing depression screening measures for systematic PSD screening.
- b. Plan an implementation project in VISN 8 and 11 evaluating the effect of implementing the existing depression screening tool on PSD detection and treatment.
- c. Identify patient, provider, and system characteristics associated with effective implementation of the PSD screening and treatment intervention; assess the effect of detection and treatment of PSD on functional outcome after stroke.

Phase I Planning Proposal. We will use the six-month planning award to develop a working group of investigators and VISN facility clinical leadership. Primary activities of this group will be conducted via biweekly conference calls and include:

- 1) Identify interest in participating among clinical and management leaders at VAMCs in VISN 8 and 11.
- 2) Identify key clinical collaborators at each site.
- 3) Examine utilization patterns of VISN 8 and 11 veterans after stroke to inform our implementation strategy (e.g. in which clinical venues would implementing the measure be most efficient?).
- 4) Select, refine and adapt the most appropriate theoretical model to guide implementation.
- 5) Plan the assessment of: 1) qualitative patient and provider data on barriers and facilitators to depression screening and treatment, and 2) facility-level organizational and system factors, based on the theoretical model.
- 6) Refine the implementation strategy based on pilot utilization and facility data.

At the end of this six-month planning process we will submit a Phase 2 Final Proposal for HSR&D Merit Review evaluation.

Product. The primary product is the modification and extension of the existing primary care depression performance measure to specifically target veteran stroke survivors who are at high risk for depression. With the existing performance measure as its foundation, this product could be efficiently implemented across multiple VISNs. The planning proposal will provide new data about utilization patterns after stroke that may inform clinical and policy decisions in the VISN. Additionally, the qualitative aspects of the study will produce new knowledge about system

barriers to integrated care, including specialist—generalist care models, and effective ways to integrate health care providers from other disciplines (neurology, rehabilitation, nursing, allied health, social work) to enhance the translation of evidence into practice in the management of PSD. This is important from a policy standpoint, as there is increasing evidence of the need for cross-disciplinary management of medical and mental health problems.

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Appendix F: VISN 8 Mental Health Performance Measure Workgroup

Appendix G: Support letters

Appendix H: List of Stroke QUERI Acronyms

AC	Anticoagulation
ADT	Antidepressant
AF	Atrial Fibrillation
AHCPR	Agency for Health Care Policy and Research
AHRQ	Agency for Healthcare Research and Quality
BRRC	Brain Rehabilitation Research Center
CBC	Complete Blood Count
CC	Clinical Coordinator
CCCS	Community Care Coordination Services
CDA	Career Development Award
CDR	Cost Distribution Reporting system
CEIBP	Center of Excellence on Implementing Evidence-Based Practice
COE	Center of Excellence
CEU	Continuing Education Units
CIEBP	Center for Implementing Evidence-based Practice
CNS	Central Nervous System
CoaguCare	The CoaguCare Project
CPG	Clinical Practice Guidelines
CPRS	Computerized Patient Record System
DPRP	Diabetes Physician Recognition Program
DSS	Decision Support system
DVT	Deep Vein Thrombosis
Dx	Diagnosis
EBG	Evidence-Based Guidelines
EBP	Evidence-Based Practice
EES	Employee Education Services
EPRP	External Peer-Reviewed Program
FSOD	Functional Status Outcomes Database
GEM	Geriatric Evaluation and Management
GWTG	Get With The Guidelines
HERC	Health Economics Resource Center
HQACM	High Quality Anticoagulation Management
IHI	Institute for Healthcare Improvement
IIR	Investigator Initiated Research
IMPACT	Information Management for Patient-Centered Treatment
INR	International Normalized Ratio
ISD	Indianapolis Stroke Dataset
ISOD	Integrated Stroke Outcomes Database
MDS	Minimum Data Set
MOU	Memorandum Of Understanding
NAVAPAAM	National Association of VA Primary and Ambulatory Managers
NPCD	National Patient Care Database
OQP	Office of Quality and Performance

ORD	Office of Rare Diseases
OT	Occupational Therapy
PI	Principal Investigator
PM	Project Manager
PM&R	Physical Medicine and Rehabilitation
PM&RS	Physical Medicine and Rehabilitation Service
PROTECT	Protecting Veterans Against Recurrent Stroke
PSD	Post-Stroke Depression
PT	Physical Therapy
PTF	Patient Treatment File
QI	Quality Improvement
QRG	Quality Related Guidelines
Qtr	Quarter
QUERI	Quality Enhancement Research Initiative
QUEST	Quality Evaluation in Stroke
RCT	Random Controlled Trial
RFA	Requests for Applications
RORC	Rehabilitation Outcomes Research Center
SDP	Service Directed Project
SDR	Service Directed Research
SF	Outpatient visit file
SLP	Speech and Language Pathologist
SPIN	Stroke Practice Improvement Network
SPM	Stroke Policy Model
SPO	Structure, Process, and Outcomes
TBN	To Be Named
TE	Thromboembolic
THINRS	The Home International Normalized Ratio Study
TIA	Transient Ischemic Attack
TIBC	Total Iron-Binding Capacity
TIDES	Translating Initiatives for Depression into Effective Solutions
TIEC	Translation Implementation and Evaluation Core
t-PA	Tissue Plasminogen Thrombolysis
TRIP	Translating Research into Practice
VISTA	VA Information System Technology and Architecture
VP	Vice President
WAVES	Well-Being Among Veterans Enhancement Study

Appendix I: List of General VA, QUERI and Other Acronyms

AAC	Austin Automation Center
AAN	American Academy of Neurology
AHA	American Heart Association
ASA	American Stroke Association
CDC	Centers for Disease Control
CMS	Centers for Medicare/Medicaid Services
DoD	Department of Defense
FIM	Functional Independence Measure
FL	Florida
FY	Fiscal Year
HIPPA	Health Insurance Portability and Accountability Act
HSR&D	Health Service Research and Development
IADL	Instrumental Activities of Daily Living
ICD-9	International Classification of Disease 9th Revision
IRB	Institutional Review Board
IRC	Implementation Research Coordinator
IU	Indianapolis University
IUSM	Indianapolis University School of Medicine
JAMA	Journal of American Medical Association
JCAHO	Joint Commission for the Accreditation of Healthcare Organizations
MI	Myocardial Infarction
NCPGC	National Clinical Practice Guidelines Council
NCQA	National Committee for Quality Assurance
NIH	National Institute of Health
RC	Research Coordinator
RN	Registered Nurse
RR&D	Rehabilitation Research and Development Services
RVA	Regular Veterans Association
RWJ	Robert Wood Johnson Foundation
SF 36 V	Short Form 36 V version
UDSMR	Uniformed Data System for Medical Rehabilitation
VA	Veterans Affairs
VACO	Veterans Affairs Central Office
VAMC	VA Medical Center
VHA	Veterans Health Administration
VIReC	Veterans Affairs Information Resource Center
VISN	Veterans Integrated Service Network