Overview of the Veterans Health Administration (VHA)
Quality Enhancement Research Initiative (QUERI)

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INTRODUCTION

The Veterans Health Administration (VHA) is the U.S. federal government’s lead agency serving the health care needs of veterans of its armed services, and the largest integrated health care delivery system in the U.S. During fiscal year 2001, VHA comprised 172 medical centers providing inpatient and outpatient services, 859 outpatient clinics (including medical center-based clinics and free-standing facilities) and 180 nursing home and domiciliary facilities. The total VHA staff of 182,946 full-time equivalents in 2001 included 11,343 physicians, over 50,000 nurses and other clinical and support staff. These professionals provided care for a total of 4,247,204 enrolled veterans, including 438,735 receiving acute care inpatient services and over 300,000 received inpatient psychiatric, nursing home or other types of inpatient care. Enrolled veterans generated a total of 42,901,000 outpatient visits during fiscal year (FY) 2001. VHA’s total annual budget (2001) exceeded $21 billion.

Given a strong desire to become a leader in delivering the highest quality of care and faced with mounting budget pressure and numerous calls for reform in its health care delivery system, VHA launched a major restructuring effort during the early 1990s. In a dramatic series of changes occurring primarily during the 1995-2000 timeframe, VHA transitioned from a tertiary/specialty- and inpatient-based care system delivering care in a traditional professional model to a primary care, outpatient-based system emphasizing team- and evidence-based care management practices and principles, and producing industry-leading quality and performance. Critical elements of this approach include ongoing measurement and public reporting of key health care process and outcome indicators, linkage between VHA senior manager compensation and indicator-based performance, a centralized system-wide computerized patient record system (completing replacing paper records in nearly all aspects of care), evidence-based on-line clinical...
practice guidelines with automated tools to support their use (e.g., computerized reminders integrated into the computerized patient record system) and many other mechanisms. The VHA restructuring represents arguably the most dramatic transformation of a large health care delivery system ever seen, and has been documented\textsuperscript{1,2,3} and praised\textsuperscript{4,5} repeatedly.

An important element of VHA’s transformation—simultaneously supporting, documenting and evaluating its design, implementation and positive impacts on clinical quality and performance—is its Health Services Research and Development Service (HSR&D). HSR&D is a component of VHA’s Office of Research and Development (ORD), which fulfills VHA’s core research mission through a diverse portfolio of medical (basic and clinical), rehabilitation and health services research. ORD’s FY 2001 budget was over $1 billion, including direct and indirect funding from VA appropriations and non-VA sources (i.e., NIH and other public and private agencies).

VHA’s HSR&D program and many of its key researchers figured prominently in the development and early implementation of the organization’s overall reform efforts. HSR&D-funded projects included survey studies and other analyses of VHA’s pre-reform operations and performance\textsuperscript{6} and “readiness” for reorganization,\textsuperscript{7} as well as specific analyses conducted to support numerous policy decisions and reorganization-related actions. HSR&D’s role in documenting and evaluating the transformation has been similarly broad, examining the progress and diverse impacts of the overall reorganization and several of its specific elements (e.g., service line reorganization, health care facility integrations and the expansion of community-based outpatient clinics).\textsuperscript{8,9,10}

These HSR&D consultation and research projects represent distinct, relatively short-term (typically 2-5 year) efforts to study and support specific aspects of the VHA transformation and
its impacts. Complementing these individual efforts is a larger, more sustained effort to study and enhance VHA clinical programs, including their quality and outcomes: the VHA Quality Enhancement Research Initiative (QUERI).

**QUERI**

Launched in 1998 as a key element of VHA’s strategy to systematically examine and enhance its quality of care, QUERI is a large-scale, multidisciplinary quality improvement initiative designed to ensure excellence in all areas where VHA provides health care services, including inpatient, outpatient, and long-term care settings. QUERI’s mission is to facilitate and support ongoing improvement in outcomes and in clinical care delivery; this mission is achieved through a range of research and improvement-related activities conducted by disease-specific QUERI Coordinating Centers, staffed by multidisciplinary teams of researchers and clinical leaders. QUERI Centers currently exist for Chronic Heart Failure, Colorectal Cancer, Diabetes Mellitus, HIV/AIDS, Ischemic Heart Disease, Mental Health, Spinal Cord Injury and Disorder, and Substance Use Disorders. Each Coordinating Center identifies evidence-based best practices in its major areas of clinical care, works to implement these practices across VHA through comprehensive organizational change efforts, and evaluates and refines these implementation efforts through collection, analysis and reporting of data on critical patient outcomes and system performance. QUERI’s goals, structure and operations are described in further detail below, followed by a brief overview of selected findings and impacts on the VHA health care delivery system’s structure and performance and a discussion of the of information technology in QUERI’s activities and accomplishments.

QUERI represents an innovative integration of health services research, policy and clinical care delivery, to identify and implement evidence-based practices in routine VHA health
care settings. VHA offers clinicians and researchers a unique organizational laboratory to implement and study processes of health care quality measurement, improvement and impact evaluation. QUERI has capitalized on this laboratory and VHA’s many other strengths and resources, to the benefit of veterans’ health and health care and the broader field of health care quality and outcomes improvement.

QUERI’s mission includes rapid and significant improvement in VHA quality and outcomes, as well as the creation of generalizable knowledge with lasting value to patients, clinicians, managers, researchers, and policy-makers both within and outside VHA. QUERI is managed by VHA’s Health Services Research and Development (HSR&D) VHA Central Office in Washington, DC. The individual QUERI Coordinating Centers are located throughout the U.S., usually within one of HSR&D’s existing health services research Centers of Excellence. Each QUERI Center is directed by a Research Coordinator, with support from a Clinical Coordinator and Implementation Research Coordinator and ongoing oversight by a multidisciplinary Executive Committee. Executive Committee members serve dual advisory and research/project roles: QUERI projects are led by the Coordinators and other core QUERI staff, as well as by individual Executive Committee members and other HSR&D investigators throughout VHA.

Overall guidance and direction for QUERI are provided by the QUERI National Advisory Council (NAC) and a Research and Methodology Review Committee (R&M Committee). Both committees advise HSR&D leadership on management of QUERI activities, and serve as liaisons between QUERI and other VHA programs and organizational initiatives.

The QUERI NAC provides overall policy guidance and direction to QUERI, and works to ensure integration of QUERI with VHA’s senior leadership and related health care operations.
NAC includes senior VHA leaders located at VA Central Office and is chaired by the VA Deputy Under Secretary for Health.

The R&M Committee provides intensive ongoing review and oversight of QUERI Coordinating Center plans, activities and methods, and facilitates selected aspects of QUERI’s integration with other VHA programs and activities (e.g., QUERI’s integration with VHA’s Office of Information and data/informatics efforts). R&M is comprised of senior clinicians, managers and researchers from throughout VHA, including representatives of HSR&D’s standing research peer review committee and other key offices throughout the organization. VHA’s Director of Health Services Research and Development Service chairs the R&M Committee. The R&M Committee reviews and assures the scientific quality and feasibility of each QUERI Center’s plans, activities and products.

Each QUERI Executive Committee is comprised of approximately 15 VHA and non-VHA clinicians and researchers with expertise in the Coordinating Center’s clinical area of interest and/or in relevant research methods, quality measurement, or policy development. QUERI activities represent only a fraction of the overall clinical and research responsibilities shouldered by Executive Committee members. Each Executive Committee is co-led by a Clinical Coordinator and a Research Coordinator who work with local research and support staff to carry out the daily work of QUERI, providing the policy, planning, and analytical work necessary to identify and address quality and performance gaps within VHA.

The QUERI Coordinators and Executive Committees develop and refine a comprehensive strategic plan specifying the QUERI Center’s priorities, projects and other activities within each of the QUERI process steps (see below). This effort is supported by continuous reviews of the published literature and analyses of knowledge and performance gaps.
within VHA, and by R&M Committee review and guidance and input from other key VHA stakeholders.

THE QUERI PROCESS

The specific activities of each QUERI Center follow the standard six-step “QUERI Process,” comprising a sequence of activities specified by the original designers of QUERI. Through literature review and experience, the designated six steps were identified as critical for systematizing quality improvement in the VHA (Figure 1). The QUERI process represents a basic framework for QUERI activity. The individual steps are not always followed in sequence, however, and may be repeated for a given clinical issue, as new information becomes available and the results of each step (and need for possible repetition of previous steps) become known.

Step 1: Identify Conditions Associated With High Risk of Disease and/or Disability and/or Burden of Illness for Veterans

The first step in the QUERI process is identification of clinical conditions and areas to be targeted. This occurs at two levels. The overall conditions addressed by the QUERI Coordinating Centers are selected by VHA and QUERI leadership (including the QUERI NAC, R&M Committee and Director of HSR&D). The individual Executive Committee for each Coordinating Center further prioritizes specific subtopics within each clinical area. For example, the Mental Health QUERI Center’s initial focus includes Major Depressive Disorder and Schizophrenia. The criteria used to select both the targeted conditions and the priority topics within each condition were selected to provide the greatest possible impact on veteran health.

During Step 1, QUERI groups also seek opportunities for collaboration on overlapping priorities, such as dual diagnosis of mental illness and substance use disorder. This is especially important since most VHA patients have multiple diagnoses, yet quality improvement and

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outcomes research have traditionally focused only on single conditions in isolation. Few organizations seek to integrate efforts to improve multiple conditions simultaneously.

**Step 2: Identification of Best Practices**

Following selection of clinical conditions and target areas, each QUERI Center identifies relevant evidence-based clinical recommendations and practices. Many QUERI Centers can draw upon a range of systematic reviews, evidence-based clinical practice guidelines and other clinical recommendations, suitable for possible refinement (updating) and implementation. This information is carefully evaluated using the Institute of Medicine and similar criteria for strength of evidence, reliability, and other attributes. Clinical recommendations and best practices with a strong evidence base and significant expected impact are assigned the highest priority for implementation through QUERI.

Areas lacking a strong evidence base may require new evidence syntheses or evidence-based guideline development efforts. Although QUERI’s mission specifically excludes development of new clinical practice guidelines, QUERI Centers may choose to work with the VHA/DoD (Department of Defense) National Clinical Practice Guidelines Advisory Council or and other programs (e.g., clinical policy development programs affiliated with VHA’s Office of Quality and Performance or Office of Patient Care Services) to facilitate development of new guidelines or to establish formal VHA clinical policies.

**Step 3: Define Existing Practice Patterns and Outcomes across VHA and Current Variation from Best Practices**

Following the identification of relevant evidence-based clinical recommendations and practices, each QUERI Center conducts research to measure and assess current VHA practice patterns, to identify and diagnose important quality and performance gaps in VHA clinical
practices and outcomes. These efforts identify opportunities for improvement and, through assessment of barriers and facilitators to change, guide subsequent efforts to eliminate quality and performance gaps. Where current VHA data systems and related tools (e.g., risk adjustment algorithms) are inadequate to produce valid evidence of performance gaps, the QUERI Center works to refine or develop the required data and tools. In many cases, QUERI Centers work to define and validate key structural, process and outcome variables and valid measures, using existing VHA data (or proposing and conducting new data collection efforts) to apply these measures. Although this process continues to be challenging, valid data and measures of key processes and outcomes are critical to any system for ongoing quality and outcome measurement and improvement.

**Step 4: Identify and Implement Interventions to Promote Best Practices**

In Step 4, QUERI works to and to identify, implement and evaluate programs and strategies to improve health care quality and outcomes. In areas were published literature provides strong evidence regarding effective implementation strategies and quality improvement programs, each QUERI Center works to adapt and implement these strategies and assure that they are used consistently throughout the organization. In areas were such guidance is not available, QUERI investigators design new strategies and programs. Sources for this work include studies of quality enhancement efforts in related clinical areas and ideas and principles adapted from basic and applied social and behavioral science theory and research (e.g., theory and research in the fields of management and quality improvement).

The immediate goal of QUERI ‘s implementation activities is to identify or develop specific tools, strategies and programs to implement evidence-based recommendations and practices in routine clinical practice settings, and then to measure resulting impacts on care
processes and on patient and system outcomes. A larger goal is to develop insights and findings from these projects to facilitate ongoing health care improvement and change throughout VHA and elsewhere.

If quality enhancement is to become institutionalized and sustained throughout VHA, QUERI and related programs must be designed to become a natural part of routine practice, rather than an added burden or a temporary effort. QUERI implementation efforts are designed to produce measurable improvements in care processes and outcomes with recognizable benefits for VHA patients, clinicians, managers, researchers, and policy-makers. These benefits contribute to broad acceptance and support for QUERI improvement programs, and to their institutionalization within VHA policies and practices (e.g., budgets and standard operating procedures).

The improvement projects conducted within Step 4 include (a) efforts to implement or translate clinical research findings and recommendations into routine clinical practice through refinements and reorganization of clinical practice systems and processes, and (b) efforts to translate successful facility-level programs into system-wide policies and practices. Both forms of translation represent perhaps the most challenging aspect of the QUERI process. While methods for measuring and analyzing clinical practices (Step 3) have been refined over several years of health services research efforts and their validity has been well-established, the state of the art in translating clinical research into feasible, routine care processes and system-wide policy is less well-developed. To address this shortcoming, QUERI has launched several coordinated efforts to strengthen each QUERI Center’s ability to successfully implement quality enhancement interventions. These efforts include (1) identification and engagement of internal (VHA) and external implementation research experts and consultants, (2) supplemental funding
to each QUERI Center to hire dedicated implementation research experts (with formal training and experience in quality improvement and/or its underlying disciplinary foundations) and (3) development of mechanisms for coordination and collaboration among the QUERI implementation researchers and their activities. Cross-cutting projects designed to leverage and enhance individual QUERI project findings and derive program-level insights into effective implementation strategies are also helping to enhance implementation expertise and skills within QUERI.

Step 5: Document that Best Practices Improve Outcomes

A core function of QUERI and a critical element in its ultimate potential is its focus on measurement and feedback as it relates to sustained improvement in patient and system outcomes. QUERI Steps 5 and 6 produce evidence and feedback regarding effective and ineffective improvement/implementation strategies and the conditions that foster success in achieving continuous, rapid implementation of evidence-based practices. Only through measurement, documentation, and rapid feedback will QUERI engage key decision-makers and health care professionals in efforts to incorporate use of evidence in routine clinical practices and policies. Clinicians’, managers’ and policy-makers’ commitment to evidence-based practice will increase with each new success in achieving reductions in morbidity or mortality and improvements in quality of life via the application of evidence to routine practice.

QUERI outcomes and impacts are generally measured through a diverse set of tools and data sources, including VHA computerized data, manual reviews of electronic medical record information and surveys of patients, their family caregivers and VHA clinicians. Together, these sources support a comprehensive assessment of important patient and system outcomes, assuring
the value and helping to further refine the QUERI quality enhancement programs and other interventions implemented in Step 4.

**Step 6: Document that Outcomes are Associated with Improved Health-Related Quality of Life**

The final QUERI step is to assess the impacts of best practices on improved health-related quality of life (HRQOL), functional status, and patient satisfaction. Although patient outcomes are addressed in Step 5 of the QUERI Process, HRQOL measures are so important and so often neglected that they are emphasized separately in the QUERI Process. In actual practice, QUERI Steps 5 and 6 are generally conducted together. By separating HRQOL in Step 6, however, QUERI plans and projects explicitly highlight the needs of patients via focused measurement and improvement of HRQOL.

**QUERI PROGRESS AND FINDINGS TO DATE**

QUERI was established as a data-driven and output-oriented improvement initiative. QUERI strives for immediate impacts on quality and outcomes within individual health care facilities, as well as development of generalizable, scientifically valid knowledge regarding improvement strategies and organizational change processes.

As early as 1999, QUERI Centers began to release output in the form of research findings regarding quality and performance gaps, and quality enhancement tools and resources. The strong, consistent emphasis on measuring and reporting the impact of implementation efforts distinguishes QUERI from other improvement initiatives. QUERI does not passively disseminate best practices, but emphasizes assessment and feedback of the benefits of bringing evidence to the bedside and to the policy table. Beginning in late 2001 and early 2002, QUERI projects addressing Steps 4-6 (implement and evaluate quality enhancement interventions and programs)
began yielding evidence of impacts. Brief overviews of several impacts are provided below, derived from presentations by QUERI researchers at the 2002 National Meeting of the VHA Quality Enhancement Research Initiative and other recent presentations and in-press publications.

The Chronic Health Failure (CHF) QUERI center implemented a multi-faceted intervention to improve CHF patient outcomes, and to reduce length-of-stay and readmission rates, via use of coordinated case management, patient education and related strategies. Initial results included a significant decrease in 14-day readmission rates (from 14.2% to 4.8%) and increased patient stability upon discharge and at the first post-discharge outpatient visit. Continuing analyses and project activity are expected to produce additional results and refinements. However, initial results suggest that system-wide implementation of the CHF QUERI program should produce dramatic improvements in CHF patient and system outcomes across VHA.

The Diabetes Mellitus (DM) QUERI group’s program is designed to increase clinician awareness of diabetic patient risk factors and to increase use of aggressive, appropriate therapy. Initial impacts include increased provider awareness of the importance of blood pressure control and significant improvements in control of blood pressure, lipids and HA1c. Initial projections from these findings suggest VHA-wide reductions of 16,000 cardiovascular events and 11,500 deaths over a 20-year period.

The Spinal Cord Injury group has completed two cycles of efforts to improve influenza vaccination practices for VHA SCI patients. The SCI QUERI research in this area led to establishment of a VHA-wide policy to identify and target SCI patients as a high-risk—and high priority—group for flu vaccination, as well as improvements in actual vaccination rates.

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Similar improvements have resulted from other QUERI programs, including successful Ischemic Heart Disease efforts to increase lipid measurement and management (projected to save 10,000 lives over 20 years) and successful efforts by the Mental Health and Substance Use Disorder QUERI centers to improve antipsychotic medication management and use of opioid agonist therapy, respectively. In both cases, measurable improvements in clinician adherence to best-practice recommendations have been seen, with further refinement and plans for VHA-wide implementation under development.

CONCLUSION

The U.S. Department of Veterans Affairs health care delivery system has been cited as a national leader in monitoring and improving its health care practices and outcomes. QUERI represents a major contributor to this leadership position, simultaneously supporting and augmenting VHA’s comprehensive efforts to develop (1) a strong data and information systems infrastructure, (2) a program of continuous measurement and reporting of health care practices and performance and incentives encouraging ongoing improvement, and (3) mechanisms to continuously identify, implement and evaluate evidence-based practices and programs to refine and improve health care delivery organizational structures, policies and processes.

VHA and QUERI offer valuable models for other public and private health care systems interested in institutionalizing continuous quality measurement and improvement policies and practices. VHA has demonstrated the feasibility and value of significant investments in the development of infrastructure and systems necessary to support improvement efforts (e.g., information systems, management practices, an innovation- and improvement-oriented culture and employee skills, and an extensive research program that is well-integrated with policy and management). VHA’s experience and success should prove both inspiring and comforting to
health care systems facing the immense, yet rewarding, challenges of comprehensive reform and performance improvement.
Figure 1. The QUERI Process

1. Identify high risk/high volume diseases/problems.
2. Identify best practices.
3. Define existing practice patterns and outcomes across VHA and current variation from best practices.
4. Identify and implement interventions (including performance criteria) to promote best practices.
5. Document that best practices improve outcomes.
6. Document that outcomes are associated with improved HRQOL.
REFERENCES CITED