

## Focus on VA QUERI Informatics

Synthesis of Research Paper ■

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

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**Abstract** The U.S. Veterans Health Administration (VHA)'s Quality Enhancement Research Initiative (QUERI) is an innovative integration of health services research, policy, and clinical care delivery designed to improve the quality, outcomes, and efficiency of VHA health care through the identification and implementation of evidence-based practices in routine care settings. A total of eight condition-specific QUERI centers are currently in operation, each pursuing an integrated portfolio of activities designed to identify and correct gaps in clinical quality and performance and to derive generalizable scientific knowledge regarding quality improvement processes and methods and their effectiveness. This overview article describes QUERI's mission, history, structure, and activities and provides a brief summary of key findings and impacts.

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The U.S. Veterans Health Administration (VHA) provides health care to meet the needs of veterans of the U.S. armed services and is the largest integrated health care delivery system in the United States. During 2003,<sup>1</sup> VHA's budget of \$25.9 billion supported 163 medical centers providing inpatient and outpatient services, more than 850 outpatient clinics (including medical center-based clinics and free-standing facilities), and 180 nursing home and domiciliary facilities. The total VHA staff of 202,709 full-time equivalents included more than 10,000 physicians, more than 50,000 nurses, and other clinical and support staff. These professionals provided care for more than 4.5 million enrolled veterans, including more than 550,000 receiving acute-care inpatient services and more than 300,000 receiving inpatient psychiatric, nursing home, or other types of inpatient care. Enrolled veterans generated more than 46.5 million outpatient visits during 2002.

Given a strong desire to deliver the highest quality of care in the face of mounting budget pressure and numerous calls for reform in its health care delivery system, the VHA launched a major restructuring effort during the early 1990s. In a dramatic series of changes occurring primarily during the 1995–2000 time frame, the VHA transitioned from a tertiary/

specialty and inpatient-based care system delivering care in a traditional professional model into a system focused on primary, outpatient-based care-emphasizing team- and evidence-based care management practices, 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 (completely replacing paper records in nearly all aspects of care), evidence-based online 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's restructuring represents a dramatic transformation of a large health care delivery system that has been documented,<sup>2–4</sup> evaluated,<sup>5,6</sup> and praised<sup>7–9</sup> extensively.

An important element of this transformation was the VHA's Health Services Research and Development Service (HSR&D) and its efforts to support, document, and evaluate the transformation's design, implementation, and impacts on clinical quality and performance. HSR&D is a component of the 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 more than \$1 billion, including direct and indirect funding from Veterans Affairs (VA) appropriations and non-VA sources such as the National Institutes of Health and other research funding agencies.

The VHA's HSR&D program and many of its researchers figured prominently in the development and early implementation of the organization's overall reform efforts. HSR&D-funded projects included surveys and other analyses

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of the VHA's pre-reform operations and performance<sup>10</sup> as well as "readiness" for reorganization<sup>11</sup> and analyses conducted to support policy decisions. 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, including service line reorganization, health care facility integrations, and the expansion of community-based outpatient clinics.<sup>12-14</sup>

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 sustained effort to systematically study and enhance VHA clinical programs, including their quality, processes, and outcomes: the VHA Quality Enhancement Research Initiative (QUERI).

### QUERI Overview

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 the 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. Its focus is 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 inside and outside the VHA.

QUERI represents an innovative integration of health services research, policy, and clinical care delivery designed to identify and implement evidence-based practices in routine VHA health care settings. The 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 the 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 is achieved through research and rigorous evaluation activities conducted by condition-specific QUERI coordinating centers (called QUERI centers), staffed by multidisciplinary teams of researchers and clinical leaders. QUERI centers currently exist for colorectal cancer, diabetes mellitus, HIV/AIDS, ischemic heart disease, mental health, spinal cord injury and disorder, stroke, and substance use disorders. Each coordinating center identifies practices with a strong evidence base in its major areas of clinical care, works to implement these practices across VHA through comprehensive organizational change efforts, and evaluates and refines the impact of implementation efforts through collection, analysis, and reporting of data on critical patient outcomes and system performance.

The individual QUERI coordinating centers are distributed throughout the United States, 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 commit-

tee members serve dual advisory and research/project roles. Each QUERI executive committee is composed 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. Peer-reviewed QUERI projects included in each QUERI center's portfolio are led by the coordinators as well as by individual executive committee members and other HSR&D investigators throughout the VHA. Each QUERI center executive committee develops and refines a comprehensive strategic plan specifying its priorities, projects, and other activities within overall VHA guidelines for the quality improvement process. The center's effort is supported by continuous reviews of the published literature and analyses of knowledge and performance gaps within VHA, by guidance from and annual merit review by the national QUERI management structure, and with advice from other key VHA stakeholders. Nationally, QUERI is led by the VHA's HSR&D Service, part of the VHA central office in Washington, DC. Overall guidance and direction for QUERI are provided by the QUERI National Advisory Council and a Research and Methodology Review 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 National Advisory Council provides overall policy guidance and direction, working to ensure integration of QUERI activities with VHA's senior leadership goals and related health care operations. The committee includes senior VHA leaders located at the VA central office and is chaired by the VA Deputy Under Secretary for Health.

The Research and Methodology (R&M) Review Committee reviews and ensures the scientific quality and feasibility of each QUERI center's plans, activities, and products. This committee provides intensive ongoing review and oversight of QUERI coordinating center plans, activities, and methods while facilitating selected aspects of QUERI's integration with other VHA programs and activities (e.g., with the VHA's Office of Information and data/informatics efforts). The committee is composed of senior clinicians, managers, and researchers from inside and outside the VHA, including representatives of the HSR&D's standing research peer-review committee and other key offices throughout the organization. The VHA's Director of HSR&D chairs the R&M Committee.

### 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.<sup>15,16</sup> Through literature review and experience, the designated six steps were identified as critical for systematizing quality improvement in the VHA (Table 1). 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 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 is identification of clinical conditions and areas to be targeted. This occurs at two levels. The overall conditions

**Table 1 ■ The QUERI Process**

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1. Identify high-risk/high-volume diseases/problems.
  2. Identify best practices.
  3. Define existing practice patterns and outcomes across Veterans Health Administration 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 health-related quality of life.
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addressed by the QUERI coordinating centers are selected by the VHA and national QUERI leadership. The executive committee for each coordinating center then assigns priorities to specific subtopics within each clinical area. For example, the Mental Health QUERI Center's initial focus includes major depressive disorder and schizophrenia. The targeted conditions and the priority topics within each condition are 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 coexisting diagnosis of mental illness and substance use disorder. This is especially important since many VHA patients have multiple diagnoses (including chronic illness) requiring complex care, yet quality improvement and 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

Each QUERI center then identifies relevant evidence-based clinical recommendations and practices. Many QUERI centers can draw on existing 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.<sup>17-19</sup> 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 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

After evidence-based clinical recommendations and practices have been identified, each QUERI center conducts research to measure and assess current VHA practice patterns and to identify and diagnose important quality and performance gaps in VHA clinical practices and outcomes. These efforts identify opportunities for improvement and, through assess-

ment of barriers to and facilitators of 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 refines or develops 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. This is a significant challenge, but 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

Once current practice patterns have been documented, each QUERI center identifies, implements, and rigorously evaluates programs and strategies designed to improve health care quality and outcomes. In areas with strong evidence regarding effective implementation strategies and quality improvement programs, each QUERI center works to adapt and implement these strategies and ensure that they are used consistently throughout the organization. In areas where such guidance is not available, QUERI investigators design and test 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 objectives are 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 the VHA and elsewhere.

If quality enhancement is to be institutionalized and sustained throughout the VHA, QUERI and related programs must 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 of 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: (1) 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 (2) 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 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 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 of improvement program impacts on 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 into routine clinical practices and policies. The commitment of clinicians, managers, and policy makers 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 outputs and impacts are rigorously measured through a diverse set of tools and methods, including the use of 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, ensuring 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 short-, intermedi-

ate, and long-term 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 most improvement initiatives. QUERI does not passively disseminate best practices but emphasizes evaluation 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. Reports of these efforts were presented in recent conferences, with several publications under review, in press, and recently published. Selected examples are summarized below.

The Diabetes Mellitus QUERI Center is working to increase clinician awareness of the risk factors of patients with diabetes and to increase the 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, lipid levels, and hemoglobin A1c levels. Initial projections from these findings suggest VHA-wide reductions of 16,000 cardiovascular events and 11,500 deaths over a 20-year period.

The HIV-AIDS QUERI Center has completed an initial quasi-experimental evaluation of alternative strategies for increasing adherence to evidence-based medication recommendations.<sup>20</sup> Subsequent work will extend the successful methods to larger samples of VHA health care facilities.

The Spinal Cord Injury Center has completed two cycles of efforts to improve influenza vaccination practices for VHA patients with SCI. The SCI QUERI research in this area led to the establishment of a VHA-wide policy to identify and target patients with SCI as a high-risk—and high-priority—group for flu vaccination as well as improvements in actual vaccination rates.<sup>21</sup>

Similar improvements have resulted from other QUERI programs, including successful efforts in ischemic heart disease to increase lipid level 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,<sup>22</sup> 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.<sup>7,8</sup> 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, performance, and incentives encouraging ongoing improvement, and (3) mechanisms to continuously identify, implement, and evaluate evidence-based practices and programs designed 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). The VHA's experience and success may inspire other health care systems facing the immense, yet rewarding, challenges of comprehensive reform and performance improvement.

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