Extreme Makeover: Transformation of the Veterans Health Care System

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Abstract

The veterans health care system administered by the U.S. Department of Veterans Affairs (VA) was established after World War I to provide health care for veterans who suffered from conditions related to their military service. It has grown to be the nation's largest integrated health care system.

As the system grew, a number of factors contributed to its becoming increasingly dysfunctional. By the mid-1990s, VA health care was widely criticized for providing fragmented and disjointed care of unpredictable and irregular quality, which was expensive, difficult to access, and insensitive to individual needs.

Between 1995 and 1999, the VA health care system was reengineered, focusing especially on management accountability, care coordination, quality improvement, resource allocation, and information management. Numerous systemic changes were implemented, producing dramatically improved quality, service, and operational efficiency. VA health care is now considered among the best in America, and the VA transformation is viewed as a model for health care reform.

INTRODUCTION

The veterans health care system was established after World War I to ensure that veterans of the nation's armed forces had access to medical care and rehabilitation for health conditions related to their military service. There was essentially no public or private health insurance in the United States at this time, and few social support programs existed for persons with disabilities.

Today, the veterans health care system is the largest health care system in the United States, although it is an anomaly in American health care in so far as being a centrally administered, fully integrated, national health care system that is both funded and operated by the federal government.

As it grew in size and complexity, the system became increasingly cumbersome and bureaucratic. It was often perceived to be unresponsive to individual needs and changing circumstances. It seemed to be chronically underfunded and short of staff and supplies, despite its rising costs. By the mid-1990s, the system was widely criticized for being difficult to access, for having long waiting times and poor service, for providing care of unpredictable and irregular quality, and for being inefficient and expensive. Many policymakers and health care professionals questioned whether it had a future.

Between 1995 and 1999, the veterans health care system was reengineered. Numerous systemic changes were made that markedly improved the quality of care, service, and operational efficiency. The system has been widely praised in recent years and held up as a model for health care reform.

This article briefly reviews the history and functions of the veterans health care system, key principles underlying its transformation, the primary strategies and tactics used to reengineer the system, and data documenting the system's improved performance.

A BRIEF HISTORY OF THE VETERANS HEALTH CARE SYSTEM

Public support of disabled veterans is deeply embedded in American culture, dating back to colonial days (161, 234, 260). Funding of veterans programs has been primarily the federal government's responsibility because national defense and foreign policy are vested with the federal government, and veterans are a result of policies in these areas.

The United States provides the most comprehensive veterans benefits of any nation in the world.

Health care benefits for veterans were originally limited to infirmary care provided by the Public Health and Marine Hospital Services [later renamed the U.S. Public Health Service (USPHS)] or civilian contract hospitals (161, 234, 260).

The Civil War represented a turning point in the federal obligation for veterans because it markedly increased the size of the veteran population. The official number of veterans grew from ~80,000 before the war to nearly 2 million at the end of the war (13), even though only Union Army veterans were counted. (Veterans of the Confederate Army were denied federal benefits until 1958, at which time only two remained alive.)

President Lincoln set the precedent for the government providing institutional care for veterans when he established the National Asylum for Disabled Volunteer Soldiers in 1866, later renamed the National Home for Disabled Volunteer Soldiers (123, 161, 234, 260).

The number of veterans needing medical care sharply increased again after World War I, prompting Congress to increase health care benefits for veterans and, in 1922, to transfer 57 USPHS hospitals to the U.S. Veterans Bureau (161). In 1924, Congress approved hospital care for indigent veterans without service-connected disabilities, establishing the legal basis for the system's role as a national safety net (123, 153, 221, 264).

On July 21, 1930, President Hoover merged the Bureau of Pensions, the National Home for Disabled Volunteer Soldiers, and the U.S. Veterans Bureau to establish the Veterans Administration (VA) (58, 234, 260). This new independent federal agency was charged with consolidating and coordinating the various veterans benefit programs that existed for the nation's then 4.7 million veterans.

The founding of the veterans health care system is generally linked with establishing the VA in 1930, although it actually took form incrementally over several decades in the first half of the twentieth century.

The VA's patient population abruptly and massively increased in the summer of 1945, when many of the more than 12 million veterans produced by World War II sought care from the agency (234). It was quickly overwhelmed. On January 3, 1946, President Truman established the VA Department of Medicine and Surgery to "streamline and modernize the practice of medicine for veterans" (234, 235, 260).

To quickly improve the quality and quantity of its physician staff, VA sought affiliations with university medical schools (233). Northwestern University and Chicago's Hines VA Hospital were the first to establish an affiliation (260), followed soon thereafter by the University of Minnesota and the Minneapolis VA Hospital. This relationship was quickly replicated across the country, ushering in a highly successful partnership between the VA and the nation's medical schools that continues today.

The system grew rapidly during the late 1940s and 1950s, adding more than 70 new hospitals, establishing academic affiliations and teaching programs, expanding research activities, and instituting new venues of care (161, 234). During these years, the VA emphasized hospital inpatient care by medical specialists, consistent with what was then viewed as the best medical care.

As the system grew and became more complex, it became increasingly cumbersome and bureaucratic. Veteran advocates and staff also argued that the system was underfunded and understaffed (234, 260).

During the 1970s and 1980s, a succession of embarrassing quality-of-care incidents occurred at individual VA hospitals. The media widely reported these incidents, indicting VA health care everywhere.

During these years, the number of veterans from the war in Vietnam needing VA care began to rise, and a growing number of these veterans were alienated by the VA's response to their problems (39, 142). Many of these veterans were already angry about participating in what they felt was an unjust war and the often hostile reception they received upon returning home. Some disgruntled veterans staged incidents to embarrass the VA (142, 156). And although the individual incidents may have been sensationalized by the media, they were symptomatic of the system's growing dysfunction.

Responding to the many veterans service organizations that had long sought higher status of veterans programs, President Reagan established the Cabinet-level Department of Veterans Affairs on March 15, 1989 (153). Because of its broad public recognition, "VA" was maintained as the acronym for the new Cabinet department, albeit now standing for "Veterans Affairs." VA became the fourteenth Cabinet agency in the executive branch of the federal government.

Like the Department of Health and Human Services, which administers its programs through 11 sub-Cabinet agencies (e.g., the Food and Drug Administration, the Centers for Medicare and Medicaid Services, and the Centers for Disease Control and Prevention) the Department of Veterans Affairs administers its health care and social support programs through a number of sub-Cabinet agencies [e.g., the Veterans Health Administration (VHA), the Veterans Benefits Administration, the National Cemetery Administration, and the Board of Veterans Appeals].

By 1994, the VA had grown to be the country's largest health care provider, with an annual medical care budget of $16.3 billion; 210,000 full-time employees; 172 acute care hospitals, which had 1.1 million admissions per year; 131 skilled nursing facilities, which housed some

VA: Veterans Administration/ Veterans Affairs (after March 15, 1989)

VHA: Veterans Health Administration

72,000 elderly or severely disabled adults; 39 domiciliaries (residential care facilities), which cared for 26,000 persons per year; 350 hospital-based outpatient clinics, which had 24 million annual patient visits; and 206 counseling facilities, which provided treatment for posttraumatic stress disorder (PTSD). The VHA also partnered with almost all states to fund state-owned skilled nursing facilities for elderly veterans and administered a contract and fee-basis care program paying for ~$1 billion of out-of-network services each year.

In addition to its health care facilities, the VHA at that time also managed 32 golf courses, 29 fire departments, a national retail store system (the Veterans Canteen Service), 75 laundries, 1740 historic sites, and various other assets. In fact, the VHA was and continues to be the largest laundry service in the world, and it oversees more historic sites than any entity except the U.S. Department of the Interior.

By this time, the veterans health care system had become highly dysfunctional. The quality of care was irregular (12, 41, 75, 81, 85, 175, 176); service was fragmented, disjointed, and insensitive to individual needs (80, 153, 156); inpatient care was overutilized (24, 76, 216); customer service was poor (77, 80, 85); and care was often difficult to access (patients sometimes traveled hundreds of miles or waited months for routine appointments) (77, 80, 85).

Reflecting popular sentiment, movies such as *Article 99* and *Born on the Fourth of July* portrayed the VA as a bleak backwater of incompetence, indifference, and inefficiency. Opponents of the government's playing a larger role in health care characterized the conditions in VA hospitals as "bordering on barbarism" (266) and pointed to the system's shortcomings as evidence that the government could not be trusted to provide health care. Other opinion leaders characterized the VA as a "bloated bureacracy" and advocated for its elimination (206, 207).

Against this backdrop, in the fall of 1994, new leadership for the VHA was recruited and charged with transforming the organization.

Specific Missions of the Modern Veterans Health Care System

The VHA is a highly complex organization. Understanding its multiple missions (four of which are specified in statute) with their associated vested interests and often complicated politics is important to understanding the challenges involved with changing the organization.

The VHA's primary mission is to provide medical care for eligible veterans to improve their health and functionality, especially for conditions related to military service (known as service-connected conditions).

As the cost of the veterans health care system grew over the years, Congress limited eligibility for VA health care to veterans who were poor and/or had a service-connected condition. Limiting access to the system this way is one of the reasons why VA's patient population is sicker and more socioeconomically disadvantaged than the general population or Medicare beneficiaries (67, 121, 196, 214, 275). Unlike Medicare or Medicaid, which are entitlement programs that must be funded according to the growth in the number of beneficiaries, veterans health care is a discretionary program that may be funded at whichever level the Congress chooses.

Within the VHA's patient population, a number of groups have been designated as special populations because their conditions are disproportionately prevalent among veterans or especially related to military service. These special populations include persons with spinal cord injuries, amputations, traumatic brain injury, serious mental illness, substance abuse disorders, and PTSD or blindness, as well as former prisoners of war, Persian Gulf War veterans, and homeless persons. The VHA is particularly commited to serve these groups and has developed special expertise in these conditions, expertise that is sometimes very limited outside the VA.

The VHA's second mission is to train health care professionals (222, 223). Approximately 50% of all American medical students and one-third of all postgraduate physician residents

receive training at VA facilities each year. Two-thirds of American-trained physicians have received at least some of their training at a VA facility. In 2007, 130 of the VA's 153 hospitals (85%) were university-affiliated teaching hospitals, and ~70% of the VA's 14,000 staff physicians held university faculty appointments.

In addition to postgraduate medical education, the VHA also offers training for more than 40 other types of health care professionals through affiliations with more than 1100 universities and colleges. More than 100,000 trainees rotate through VA health care facilities each year.

The VHA's third mission is to conduct research that will improve veteran care (205). VHA conducts research in the basic biomedical sciences, rehabilitation, health services delivery, and quality improvement. Nesting a dedicated research program within the VA's immense health care delivery system, with its stable patient population having a high prevalence of chronic conditions, creates a unique opportunity for medical care and health services delivery research. VA research played a critical role in the development of the cardiac pacemaker, CT scanners, the Seattle Foot, and many other prosthetic devices and has yielded seminal discoveries about PTSD, schizophrenia, Alzheimer's disease, drug addiction, and alcoholism, to name a few of the areas in which VA investigations have been prominent.

The system's fourth mission is to provide contingency support to the military health care system and the Department of Homeland Security. In times of national emergencies, the VHA provides personnel, pharmaceuticals, supplies, and other support to the National Disaster Medical System (14, 136).

The final mission of the VHA is to serve the homeless, since about one-third of adult homeless men in the U.S. are veterans. The VA's homeless programs constitute the largest network of homeless assistance programs in the country, and the VA is the nation's largest direct provider of services to homeless persons, providing health care services (among others) to more than 65,000 homeless veterans each year (200).

REENGINEERING THE VETERANS HEALTH CARE SYSTEM

In 1994, there was widespread consensus that the veterans health care system needed a major overhaul but little agreement about how to effect the change. Further, the system had to remain fully operational while it was being overhauled.

Under new leadership recruited from outside the system—the first time this had occurred in more than 30 years—a plan to radically transformVA health care was developed in the winter of 1994–1995 (130), vetted with the Congress (as required by law) and the VA's myriad stakeholders in the spring and summer of 1995, and launched in October 1995. Many of the underlying principles and objectives of the effort are detailed elsewhere (130, 131).

Transformation Vision and Principles

The reengineering sought to create a seamless continuum of consistent and predictable high-quality, patient-centered care that was of superior value (45, 130, 131).

VHA leadership felt that it was imperative that (*a*) superior quality of care was predictable and consistent throughout the system; (*b*) VA health care was of equal or better value than care provided by the private sector; and (*c*) the VHA was a high reliability organization. VHA leadership felt that if the VHA were to continue to be publicly funded, it had to demonstrate that it provided good value to both veterans and the American public. To do so required that there be a relatively objective method to determine value. This was done by using the value equation (see Equation 1), in which value is considered to be a function of technical quality, access to care, patient functional status, and service satisfaction all divided by the cost or price of the care.

$$V = \int A + TQ + FS + SS/C, \qquad 1.$$

VISN: veterans integrated service network

where V is value, A is access, TQ is technical quality, FS is functional status, SS is service satisfaction, C is cost (or P is price). Each of the four value domains in the numerator was linked to a menu of standardized performance measures that, whenever possible, were the same as those used by the private sector.

Transformation Strategies

The proposed reengineering was based on five interrelated and mutually reinforcing strategies: to (*a*) create an accountable management structure and management control system, (*b*) integrate and coordinate services across the continuum of care, (*c*) improve the quality of care, (*d*) align system finances with desired outcomes, and (*e*) modernize information management.

Change strategy 1: Create an accountable management structure and management control system. The most visible steps taken to increase organizational accountability were the establishment of a new operational and management structure based on the concept of integrated delivery networks, the implementation of a new performance management system, and the decentralization of much of the operational decision making.

Establishment of veterans integrated service networks. In October 1995, the reengineering plan was launched by organizing the VHA's more than 1100 sites of care delivery into 22 veterans integrated service networks (VISNs, pronounced "visions") (130). The selection of 22 VISNs was based on a judgment about the best distribution of care delivery assets matched with geographic catchment areas that had ~250,000 veteran users. The catchment areas of the VISNs were determined primarily according to prevailing patient referral patterns, the ability of each vision to provide a continuum of primary to tertiary care with VA assets, and state or county jurisdictional boundaries. A typical VISN encompassed 7–10 VA hospitals, 25–30 ambulatory care clinics, 5–7 nursing homes, 1–2 domiciliaries, and 10–15 counseling centers. The number of VISNs was reduced to 21 in 2002 after the closure of several hospitals and other changes in the original VISN 14 and neighboring networks (**Figure 1**).

The VISN became the system's basic operating unit. The idea was that it would provide a structural template for coordinating services, pooling resources, and ensuring continuity of care; reducing service duplication and administrative redundancies when appropriate; improving the consistency and predictability of services; promoting more effective and accountable management; and overall, optimizing health care value (130, 138, 141).

Implementation of the new performance management system. A new performance management system was instituted in 1995 (131, 226). Central to this new system was measuring performance using standardized metrics and an annual performance contract that helped clarify management expectations, encourage managers' engagement, and hold management accountable for achieving specified results. The use of such performance contracts was novel within the federal government.

In this new performance management system, the organization's vision and mission were aligned with quantifiable strategic goals; performance measures to assess progress toward achieving these goals were identified; population data to assess clinicians' adherence with evidence-based clinical guidelines were tracked and made widely available; and management was held accountable for the results achieved.

Decentralization of operational decision making. Over the years, the VHA had developed a fault-finding, untrusting, punitive culture in response to its command and control, military-style management, and the organization's intense oversight by Congress (116), the veteran service organizations, VA interest groups,

education-related certifying organizations, research oversight bodies, the media, and others, in addition to the usual health care accreditation organizations and regulatory agencies. Concomitant with this, much of the operational decision making had been centralized at VA headquarters in Washington, DC, far removed from the site of the issue or problem and far removed from the front lines of patient care. Centralization of decision making markedly slowed the decision-making process and also increased the politicization of issues and reduced field management accountability.

To improve the timeliness and quality of decision making, as well as to increase accountability, a substantial amount of the operational decision making formerly done in headquarters was delegated to the VISNs. The goal was to decentralize decision making to the lowest, most appropriate management level and then to hold management accountable for their decisions. In doing this, deficiencies in system policies and procedures were often exposed that had been masked when decision making was centralized, as were limitations in the mechanisms available for holding managers accountable.

Change strategy 2: Integrate and coordinate services. When the reengineering commenced, the two biggest problems in the VA's delivery of care were its variable quality and its fragmentation. Fragmentation of care is a serious problem everywhere in American health care, but it was especially bad in the VA at this time because of the system's historical bias toward specialist-based, inpatient care; the limited use of care management and primary care; the sociodemographics of the VA's service population; the anachronistic laws governing eligibility for care (78); and the high rate of dual eligible patients (79, 227). (Dual eligible patients are eligible for care provided by the VA and another system. The other system is most often Medicare but may be the Indian Health Service, Tri-Care for military retirees, and/or private indemnity insurance.)

The VHA transformation sought to reduce care fragmentation through a number of systemic changes aimed at coordinating and integrating service delivery across the continuum of care. Particularly important in this regard were implementation of universal primary care, revision of the laws governing eligibility for care, and creation of the VISNs. Efforts to obtain Congressional approval for VA hospitals to participate in the Medicare program to help rationalize the care of dual eligibles were unsuccessful.

Implementation of primary care. A number of primary care pilot projects were pioneered at VA medical centers in the 1980s and early 1990s (43, 46, 99, 100, 202, 203), but only ~10% of VA health care users were enrolled in primary care at the end of fiscal year (FY) 1994. Most VA medical centers did not have any primary care programs at this time. Indeed, implementation of primary care was contrary to the specialist-dominated culture that existed at many VA hospitals and their academic affiliates, and its implementation was sometimes vigorously opposed.

Universal primary care was viewed as the lynchpin for integrating and coordinating care delivery and was felt to be essential no matter what else was done to restructure the system; therefore, a primary care initiative was launched early in FY 1995 before finalizing the VISN reorganization and other reengineering plans (160, 270).

In addition to facility-based primary care, VHA also substantially expanded a pilot home-based primary care (HBPC) program (101). HBPC included a primary care manager, 24-hour contact for patients, prior approval of hospital readmissions, and HBPC team participation in discharge planning, among other things.

Eligibility reform. The federal laws governing eligibility for VA health care were a major cause of service delivery fragmentation. These laws were strongly biased toward inpatient hospital care, often requiring patients to be hospitalized for procedures routinely done on an

CBOC: community-based outpatient clinics

outpatient basis at this time. In many instances, they also required that the VHA treat only a veteran's service-connected condition, which often was not the veteran's greatest health care need. Even when that health care need was directly aggravating the veteran's service connected condition, the VHA could not legally treat it. This was felt by VHA leadership to be both illogical and immoral. Thus, a key component of the VHA's reengineering was gaining authority to treat the entire person, as needed, and to be able to do so in the most appropriate medical care setting.

Repeated attempts to change these laws had been unsuccessful because key Congressional leaders feared that rationalizing them would increase utilization and, consequently, costs. After failing to obtain the needed statutory change in FY 1995, based on arguments about how this would improve the quality of medical care, VHA leadership used a different tact in FY 1996, arguing instead how the eligibility rules made it impossible to manage the cost of the system prudently. This strategy change seemed to be pivotal in gaining enactment of the Veterans Health Care Eligibility Reform Act of 1996 (250).

This new law gave the VHA statutory authority to provide medical care to veterans in any medically appropriate setting, to treat any and all the patient's conditions, to outsource services or partner with non-VA health care providers, and to establish an enrollment system.

Other efforts to increase the coordination and integration of care. Other steps were taken to better coordinate and integrate care. For example, between 1995 and 1999, 52 VA medical centers were merged into 25 multicampus facilities under single management (229, 244); multiinstitutional service lines (e.g., in primary care or behavioral health) were implemented in several VISNs (36); multidisciplinary strategic health care groups were organized at VHA headquarters (130); care management was implemented as a systemwide strategic initiative (55); better continuity of care through more convenient access was pursued by establishing hundreds of new community-based outpatient clinics (CBOCs) (4, 33, 64, 65, 129, 209); and the national formulary of prescription drugs, nonprescription medicines, and medical supplies was established in 1997 to promote evidence-based drug prescribing and to improve pharmaceutical management (23, 140, 208, 271). (Before the National Formulary was instituted, each medical center had its own formulary, and the variable availability of prescription drugs was the single biggest cause of patient complaints.)

Change strategy 3: Improve the quality of care. Improving the quality of care and standardizing superior quality were paramount objectives of the reengineering. Performance measurement and public reporting of performance were cornerstones in this regard.

Performance management. As part of the new performance management system, clinical performance was routinely measured and tracked. Two specific instruments were developed to initiate this new focus on performance assessment: the prevention index and the chronic disease care index (133). Both were instituted late in FY 1995 to track adherence to established clinical best practices for common preventable or chronic conditions. A palliative care index was instituted in 1997 to track adherence to best practices for end-of-life care (133, 183, 194).

The prevention index consists of nine clinical interventions that measure how well VHA practitioners follow nationally recognized primary prevention and early detection recommendations for eight diseases with major social consequences: influenza and pneumococcal diseases; tobacco consumption, alcohol abuse, and cancer of the breast, cervix, colon, and prostate. The chronic disease care index consists of 14 clinical interventions that assess how well practitioners follow nationally recognized guidelines for 5 high-volume diagnoses: ischemic heart disease, hypertension, chronic

obstructive lung disease, diabetes mellitus, and obesity.

Other quality-improvement activities. In addition to quality-improvement efforts that were guided by performance measurement, improving the quality of care was also sought by promoting the use of evidence-based clinical guidelines (132, 159, 237); partnering with the Institute for Healthcare Improvement on the Collaborative Breakthrough Series for reducing waiting times, improving operating room performance, and improving access to primary care, among other things (31, 40, 107–116, 162–164, 252, 261, 262); establishing clinical programs of excellence (241); creating a knowledge management tool known as the VA Lessons Learned Project, which featured an Intranet-based virtual learning center (VLC) to promote rapid-cycle learning from successes and errors that had occurred in the system (254); establishing the National Center for Health Promotion and Disease Prevention to encourage the planning, monitoring, and provision of clinical preventive services (52); and launching quality-improvement initiatives for specific clinical conditions or operational issues where data showed there were significant quality-improvement opportunities. These areas included pain management (40, 210), end-of-life care (22, 84, 133, 183, 194), cancer (265), AIDS/HIV (27, 146, 228), pressure ulcers (17–19), acute myocardial infarction (150, 186–188, 193, 230), hepatitis C (97, 165, 197, 268), and autopsies (246, 247). Further, a high performance employee development model was instituted (1, 239).

Another important clinical quality-improvement effort was the National Surgical Quality Improvement Program (NSQIP), begun in 1991 in response to a 1986 Congressional mandate that VA compare its risk-adjusted surgical results with those of the private sector (20, 47, 126–128). The effort was embraced as part of the transformation effort.

Concomitant with efforts to improve the quality of care, steps were also taken to increase the knowledge base about clinical quality improvement and to encourage innovation. These efforts included establishment of the VA National Quality Scholars Fellowship Program (15, 66, 190, 218) and the VA Faculty Fellows Program for Improved Care for Patients at the End of Life (22, 84); implementation of the Quality Enhancement Research Initiative (QUERI) (9, 27, 50, 57, 59, 61, 62, 105, 137, 147); and development of hundreds of innovations in care delivery (16, 35, 134, 238).

NSQIP: National Surgical Quality Improvement Program

Improving patient safety. The VHA took a leadership role in the emerging national patient safety movement and worked closely with key national organizations on patient safety issues, establishing the National Patient Safety Partnership in 1997, helping to fund the Harvard Executive Session on Medical Errors, and supporting the National Patient Safety Foundation, among other things (133, 151).

The VHA launched its pioneering patient safety initiative in 1997. This five-pronged initiative aimed to (*a*) build an organizational infrastructure to support patient safety (e.g., establishing the VA National Center for Patient Safety in 1998); (*b*) create an organizational culture of safety; (*c*) implement known safe practices; (*d*) produce new knowledge about patient safety through research; and (*e*) partner with other organizations to promote more rapid problem solving of patient safety issues. Numerous specific interventions were implemented, including especially efforts to identify and learn from errors and near misses, improve medication safety, reduce patient falls, and eliminate health care–associated infections (48, 53, 70, 94, 133, 151, 157, 162, 164, 181, 182, 212, 219, 249, 259, 263).

Change strategy 4: Align system finances with desired outcomes. Another systemic problem with veterans health care in 1995 was that the Resource Planning and Management Resource Allocation Methodology used to distribute Congressionally appropriated funds to the medical centers was neither predictable nor easily understandable. It provided few

VERA: veterans equitable resource allocation

CPRS: computerized patient record system

EHR: electronic health record

VistA: veterans health information systems and technology architecture

incentives for striving for efficiency. Thus, a further key reengineering strategy was to make funding more understandable and predictable and to align funding with operational efficiency and clinical quality improvement.

Creation of the veterans equitable resource allocation system. To create a predictable, fair, and easy-to-understand method for allocating funds, a new global fee-based resource allocation system known as VERA—i.e., the Veterans Equitable Resource Allocation methodology—was developed (152, 242, 243, 245, 257, 258). This methodology acknowledged the veteran population shifts that had occurred in the 1970s and 1980s (i.e., the rust belt to sun belt migration) and the high degree of morbidity prevalent in the veteran population.

Under VERA, VA patients are divided into two categories on the basis of the types of services required in the preceding three years (i.e., Basic Care and Complex Care). Each category is given a national per-patient price on the basis of the average of expenditures for the services provided. These prices are then adjusted according to several variables specific to each VISN (e.g., cost of labor and amount of educational and research activity). Approximately 95% of VA patients fall into the Basic Care category, which provides a scope of benefits comparable to Medicare Advantage and accounts for about two-thirds of VA medical care expenditures. The 5% of patients falling into Complex Care, which includes services generally not covered by Medicare, account for the remaining expenditures. Although the Basic Care benefit package is comparable to Medicare Advantage, its annual rate is substantially less than the Medicare Advantage rate. VERA was designed to allocate funds to the VISNs, not to individual hospitals or clinics.

Expansion of the funding base. Historically, funding for the veterans health care system came only from the annual Congressional appropriation. As part of the transformation, a greater effort was made to diversify the system's funding base by collecting and retaining insurance reimbursement.

Change strategy 5: Modernize information management. The success of any health care delivery system today depends on its ability to successfully manage large amounts of information originating from disparate sources. Improving VHA's information management capability through use of a systemwide electronic health record was considered essential from the outset. The VHA was well positioned in this regard.

Implementation of CPRS/VistA. The VHA began developing a computerized health care information management system to support clinical care in the late 1970s and was well ahead of the private sector in the use of information technology (IT) by the early 1990s (93).

In 1996, the VHA launched a major initiative to upgrade its IT infrastructure to create a communications platform robust enough to support the VISNs and to ensure a minimum level of systemwide connectivity and responsiveness. Once the IT infrastructure was upgraded, the VHA was able to move forward quickly with nationwide implementation of the Computerized Patient Record System (CPRS) in 1997. When CPRS was combined with a new graphical user interface, the VHA's new electronic health record (EHR) became known as the Veterans Health Information Systems and Technology Architecture, or VistA (2, 28, 29, 42, 144, 167, 180, 232, 248).

CPRS/VistA was implemented at selected medical centers in February 1997 and rolled out to all facilities in six successive phases. The last medical center to go live with CPRS/VistA did so in December 1999. The rapidity and smoothness of this massive deployment—the largest and most rapid deployment of an EHR ever completed—was most likely due in large part to the antecedent widespread use of the VA's Decentralized Hospital Computer Program, the precursor to CPRS/VistA.

CPRS/VistA includes an enterprise-wide computer-based patient record; clinical decision support with clinical reminders, a real-time order checking and clinical alert system, a notification system, and disease management features; computerized provider order entry (CPOE); a clinical data repository; privacy protections; and a means to facilitate clinical work flow by providing real-time data, among many other functions, across the entire enterprise (29, 105, 167).

Other information management initiatives. In addition to CPRS/VistA, other IT enhancements included implementation of an automated cost accounting and decision support system (83), development and implementation of a bar code medication administration system (120, 181, 249, 263), and implementation of a semismart registration and access card.

Funding the Transformation

No specific funding was appropriated for the VHA's reengineering, although the Office of Management and Budget did agree to allow the VHA to retain savings and redirect the funds to new initiatives (e.g., establishing CBOCs) as it reduced operating costs by eliminating excess capacity (e.g., closing acute care beds), negotiated more favorable pricing on needed goods and services (e.g., pharmaceuticals and the National Formulary), or provided care in lower-cost settings (e.g., moving more care to the outpatient setting when clinically appropriate).

Between FY 1995 and FY 1999, inclusive, the Congress increased the VA's medical care budget by $1.7 billion (raising it from $16.5 billion to $18.2 billion), for a total 5-year aggregate increase of 10%, even though the number of patients receiving hands-on care increased by 24% (>700,000 new patients) and medical care inflation was averaging more than 6% per year during these years.

For comparison, in the 5 years preceding the transformation (i.e., FY 1990–FY 1994), the medical care budget increased 37% with a minimal increase in the number of patients, and in the 5 years after the transformation (i.e., FY 2000–FY 2004), the budget increased 45%, while the number of users nearly doubled.

CPOE: computerized provider order entry

THE VA HEALTH CARE SYSTEM TRANSFORMED

Over a period of less than five years, almost every major management system in the VHA was dramatically changed and operational performance improved. **Table 1** lists many of the changes that occurred.

In recent years, the veterans health care system has been widely praised for providing some of the best health care in America and for being a model of high-quality, low-cost health care (6, 30, 32, 68, 73, 85, 88, 148, 156, 157, 178, 189, 191, 204, 217, 220, 224, 255). The system has been hailed as a model for health care reform (30, 72, 85, 90, 96, 106, 156, 172, 179, 212, 224, 253).

Improved Clinical Performance and Quality of Care

Documentation of the improved clinical performance of the "new VA" comes from many sources.

Jha et al. (118) showed that the VHA markedly improved its performance on a standardized panel of quality-of-care performance measures from 1995 to 2000. He further showed that the VHA's performance was superior to fee-for-service Medicare on 11 of 11 performance measures used by both systems for the period 1997–1999 and on 12 of 13 measures in 2000.

Another study showed that the VA's compliance with recommendations for influenza and pneumococcus vaccinations rose from 27% and 28%, respectively, in 1995, to 70% and 85%, respectively, in 2003 (119). In addition, variation in vaccination rate (e.g., due to geography, clinical indication, and site of treatment) largely disappeared. Concomitantly, VA hospital admissions for community-acquired pneumonia dropped by 50% compared with a 15% increase among Medicare patients, among whom only minimal increased vaccination rates occurred.

Table 1 VA health care changes that occurred during fiscal years (FYs) 1995–1999

- Implemented the new VISN management structure and its 22 new integrated service networks
- Designed and implemented a national formulary
- Implemented universal primary care
- Completed the largest ever deployment of an electronic health record in less than three years
- Developed and deployed a universal "semismart" access and identification card
- Closed 28,986 acute care hospital beds
- Decreased bed days of care per 1000 patients by 68%
- Admitted 350,000 fewer patients to hospitals in FY 1999 compared with FY 1995, even though >700,000 more patients received hands-on care in FY 1999 than in FY 1995 (a 24% increase in patients treated)
- Reduced staffing by 25,867 Full-Time Employee Equivalents (a 12% decrease)
- Established 302 new community-based outpatient clinics
- Merged 52 medical centers into 25 multicampus facilities
- Eliminated 2793 (72%) forms and automated the remainder
- Designed and implemented a new global fee-based resource allocation system (VERA) to allocate appropriated funds to the VISNs
- Increased the proportion of surgeries performed on an ambulatory basis from 35% to more than 80%; significantly decreased 30-day surgical morbidity and mortality and increased the total number of surgeries performed by 10%
- Decreased per-patient expenditures by 25.1% (in constant dollars)
- Dramatically improved quality of care; performance on standardized quality of care indicators was higher than Medicare on all but one measure
- Developed and implemented customer service standards; markedly improved service satisfaction with VA health care service rating higher than the private sector every year since 1999, according to the annual American Customer Satisfaction Index
- Launched the largest ever translational research initiative [i.e., the Quality Enhancement Research Initiative (QUERI)]
- Realigned the system's $1 billion research program to better address veterans needs
- Realigned postgraduate physician residency and other educational programs; increased the proportion of VHA's 9000 residency positions dedicated to primary care from 34% in 1994 to 49% in 2000
- Established the Bachelor of Science in Nursing as the required entry-level degree for the system's 40,000 registered nurse workforce and committed $50 million to help currently employed nurses achieve this level of education.
- Markedly reduced waiting times

Kerr and colleagues (124) compared diabetes management in the VA to commercial managed care organizations according to 7 process, 3 outcome, and 4 care satisfaction measures. VA patients scored better on all process measures, as well as on cholesterol and blood glucose control. Hypertension control and patient satisfaction with their care were similar in both populations. Singh & Kalavar (213) reported similar findings. Ward et al. (256) observed that the VA's better adherence with diabetes care guidelines was associated with frequent feedback to frontline caregivers, more effective communication between physicians and nurses, and other organizational characteristics. Proper management of diabetes is especially important for the VA because more than 25% of its patients are diabetic, and this population has an exceptionally high rate of comorbidity and use of health care services (10).

Using RAND's quality assessment instrument of 348 indicators covering 26 conditions, Asch et al. (7) compared VA patient care in 12 VISNs with 12 matched communities for the period 1997 through 2000. VA performance was significantly better for overall

quality, chronic disease management, and preventive care and was essentially the same for acute care. Although differences were greatest for conditions for which the VHA had established performance measures and actively monitored performance, better quality of care was not confined solely to the areas targeted for quality improvement (8).

Using the nationally representative 2000 and 2004 surveys of the Behavior Risk Factor Surveillance System, veterans treated at VA medical centers were substantially more likely than veterans treated at non-VA facilities and insured adults treated at private health care facilities to receive recommended ambulatory care services for cancer prevention, cardiovascular risk reduction, diabetes management, and infectious disease prevention (98, 201). Doebbeling et al. (52) also showed that VHA practitioners had substantially increased adherence with evidence-based clinical guidelines for preventive services throughout the system, although considerable variation in the level of compliance continued to exist among facilities. He could not identify which organizational interventions (e.g., education, providing performance feedback to institutions and providers, local development or modification of the guidelines) were most effective in promoting adherence.

Selim and colleagues (211) compared risk-adjusted mortality in persons cared for by the VA or the Medicare Advantage Program for the period 1999 to 2004 and found that the average male and female patient cared for in the VA had a 40% and 24%, respectively, decreased risk of death over two years compared with the average male and female patient in the Medicare Advantage Program. They could not determine which differences in care structures and processes contributed to the lower mortality in the VA.

The NSQIP's linkage to improved surgical outcomes attracted the attention of the private sector in 1999. After demonstrating the feasibility of implementing NSQIP in the private sector (60), this quality-improvement program has been found to be fully applicable to private-sector surgical programs and is being increasingly used by private health care providers (125).

Implementation of the National Formulary largely resolved the problem of varying availability of drugs and appears to have been effective in improving evidence-based drug prescribing, while concomitantly achieving sizable price reductions from manufacturers and maintaining physician satisfaction (87, 89, 104). Likewise, with barcode medication administration, CPOE, automated prescription filling, and other measures implemented to improve medication management (74, 261), the VHA has achieved unparalleled accuracy rates in medication administration. Illustrative of this, in 2005, VHA filled 231 million prescriptions with an accuracy rate of 99.993% (173).

Higher Service Satisfaction

Service satisfaction among VA health care users substantially improved from 1995 to 1999. In 1999, 80% of VA health care users felt that care had improved from 2 years earlier, and overall satisfaction with the VA's service rated 79 on the American Customer Satisfaction Index (ACSI); this compared with a score of 70 for overall satisfaction in private-sector hospitals (169). Corroborative of this, from 1999 to 2003, the number of veterans using VA health care rose from 3.4 million to more than 7 million, suggesting that veterans had recognized the improvement and were "voting with their feet" (63, 69, 231).

The VHA's service satisfaction ratings on the ACSI have been higher than the private sector every year since 1999 (68, 170, 171), and VA health care users are reported to be 2–8 times more satisfied with their outpatient care than are non-VA users (95).

The three factors most often linked with the improved service satisfaction were implementing primary care, reducing waiting times, and improving access to care through the CBOCs (4, 25, 26, 34, 107–115, 154, 198, 209). Four years after launching the primary care initiative, internal surveys showed that essentially all

patients in the VA health care system had been assigned to a primary care team, and more than 80% of patients could name their primary care provider.

Greater Operational Efficiency

Between 1995 and 2000, the VHA substantially improved access and efficiency (**Table 1**) (82, 83). Measures were taken to decrease inpatient length of stay, close excess acute care beds, increase ambulatory capacity, shift care to ambulatory settings when medically appropriate, and better utilize nonphysician independent licensed practitioners in primary care, therapeutic monitoring, and other clinically appropriate settings (11, 21, 37, 38, 51, 64, 71, 102, 103, 139, 158, 168, 177, 195, 236, 240, 267). The General Accounting Office reported that during the 3-year period from 1996 to 1998, the VHA reduced annual operating costs by more than $1 billion, allowing it to realize a nonappropriated revenue surplus of $496 million in FY 1998 (83).

Ashton et al. (10) reported on decreased hospital utilization for 9 cohorts of the VHA's most vulnerable patients. In this landmark study, hospital bed day rates and urgent clinic visits for the 9 cohorts fell by 50% and 35%, respectively, from 1995 through 1998. A moderate increase in medical clinic visits occurred, but there was an overall substantial reduction in the amount of care provided. In all nine cohorts, the one-year survival rates stayed the same or significantly improved (i.e., for congestive heart failure, angina, and major depression).

Access to and the quality of VA mental health care also improved (21). The VHA's spending for inpatient mental health decreased 21% from 1995 to 2001, whereas expenditures for specialized outpatient care rose 63% (37). Although this shift from inpatient to outpatient mental health care was accompanied by substantial increases in outpatient medication costs, it resulted in a 22% overall reduced average per-user cost of mental health care and a 35% increase in the number of persons cared for (37). The CBOCs accounted for at least some of the increased access to mental health services (198, 267). Service line implementation of mental health services was associated with significant improvement in continuity of care and readmission rates (91). Long (155) also observed that the VHA has been increasingly serving veterans who have trouble accessing private health care (e.g., for mental health services).

Kominski et al. (145) reported that proactive screening of hospitalized VA patients to identify unrecognized comorbid psychiatric conditions (e.g., depression, anxiety, or alcohol abuse) combined with comprehensive assessment and psychogeriatric interventions improved care and reduced inpatient utilization, yielding a net average savings of $1856 per patient over a 12-month follow-up period. The savings were attributable to fewer bed days of care rather than fewer admissions.

Rosenheck & Fontana (199) found significantly decreased in-patient care but found no deterioration in treatment effectiveness for PTSD due to shortened inpatient stays, although there were mixed effects in residential treatment programs.

The VHA's approach to treating persons with substance abuse disorders, one of its special populations, increased outpatient care and decreased inpatient care (38, 102, 103, 177). The change was described by Humphreys et al. as "nothing short of dramatic" (103); however, because of the long distances that these patients often lived from VA medical centers and the lack of stable housing for many of them, they also expressed concern about the ultimate impact this might have on patient care.

Thibodeau et al. (225) documented a significant decreased cost per patient and improved quality of services in the VHA from 1992 to 1998; she attributed this mainly to reductions in excess capacity and more intense use of remaining capacity. Consistent with these observations, Yaisawarng & Burgess (269) found that the average VA hospital in FY 2000 operated at an efficiency level of 94% compared with 90% in private hospitals.

VERA markedly simplified VHA's budgetary process and provided financial incentives for both coordinating care and providing care in the least expensive appropriate setting. Between FY 1994 and FY 1999, VHA's systemwide average annual expenditure per patient decreased from $5479 to $4105, a 25.1% decrease in constant dollars. (In this calculation, VERA's Basic and Complex Care patient categories were combined to allow comparison with expenditures pre-VERA.)

Improved Information Management

Implementation of VistA has been linked with improved quality of care, increased productivity, and enhanced operational capability (28, 192). Early on in the implementation of VistA, some feared that use of the EHR would require more time for physicians during a clinical session, but this was found not to be the case (192). On the contrary, an increased productivity of nearly 6% was noted for clinicians using VistA (56).

Although VistA is believed to have played an important role in improving the system's performance, substantial improvement in performance was documented before CPRS/VistA's deployment commenced. The integration of VistA and the performance management system seems to have been especially effective at driving improvement. The Institute of Medicine commented, "VHA's integrated health information system, including its framework for using performance measures to improve quality, is considered one of the best in the nation" (44). Some information technology experts have characterized VistA as the best EHR in the world (Glaser, quoted in 251) and the use of VistA to help drive quality improvement as "the most accomplished in the world" (86). Because VistA was deployed comcomitant with implementing multiple other systemic changes, it is not possible to apportion how much of the system's improvement was due to the different change strategies. There is likely significant synergism among the EHR, performance measurement, increased accountability, aligned financial incentives, and an environent focused on quality improvement, accountability, and population health (3, 117, 149, 274).

Education and Research

Substantial changes were also made in the VHA's education and research programs. The research program was realigned to better address veterans needs, as illustrated by QUERI, the largest ever quality-improvement, translational research initiative (174, 205).

Likewise, the VHA's educational programs were realigned (222, 223); the proportion of primary care positions in the 9000 residency positions funded by the VHA increased from 34% in 1994 to 49% in 2000 (222).

Lessons Learned

The reengineering of the veterans health care system has been the subject of a number of dissertations, case studies, reviews, and commentaries (5, 49, 54, 92, 122, 135, 141, 143, 166, 178, 184, 185, 215, 272, 273). Space does not allow for a discussion of the many observations and lessons that can be derived from the system's transformation, although some of the lessons learned are listed in **Table 2**.

THE FUTURE OF THE VETERANS HEALTH CARE SYSTEM

The veterans health care system performs much better today than it did a decade ago, and in recent years it has received many accolades for innovations in care delivery and improved quality. Nonetheless, there are myriad opportunities for further improvement in its processes and outcomes, and the reengineering described in this article should be viewed as a work in progress.

The veterans health care system faces many challenges in the years ahead as health care costs continue to rise, the expectation of higher

Table 2 VHA transformation observations and lessons learned

1. The government can provide high-quality and efficient patient-centered health care.
2. Rapid and dramatic change is possible in health care, even in large, politically sensitive, financially stressed, publicly administered health care systems.
3. Improved health care quality, better service, and reduced cost can all be achieved at the same time.
4. Articulation of a clear vision of the new future and how things will be different is essential for any major change effort.
5. The vision must be combined with a pragmatic strategic plan that includes concrete goals, defined responsibilities, and performance measures to assess progress toward achieving the goals.
6. Measuring and publicly reporting performance data using standardized performance measures is a powerful lever for change.
7. Performance data must be fed back to those who can make improvement (e.g., frontline caregivers).
8. To improve performance or quality, leaders must show that improvement is an organizational priority and make sure that everyone in the organization knows it.
9. Decentralization of authority must be coupled with a full understanding of mission-critical activities, clear delineation of responsibility and accountability, and monitoring of performance to help prevent things from falling through the cracks.
10. Automated information management is a critical tool for health care transformation and quality improvement; the electronic health record (EHR) is an essential tool today.
11. An integrated system of health care can be achieved with either vertical and/or virtual integration. The information management system, contracts, partnership agreements, and similar arrangements are the glue that holds a virtually integrated system together.
12. Focusing on changing organizational performance and processes is more productive than focusing on poor-performing individuals.
13. If health care change is to be successful, then frontline clinicians must be continuously part of the planning and implementation from the beginning.
14. Much of what is needed to accomplish and sustain change needs to be in place prior to initiating the change effort.
15. When undertaking major change, there is no such thing as too much communication about the proposed changes.
16. Training and education are critical components of the change process so that personnel are prepared to function in a new way.
17. No matter how good or extensive the planning is, it can never foresee every problem that may require mid-course correction. Therefore, in planning for change, perfect should not become the enemy of the good.
18. Health care organizations are complex adaptive systems governed by the rules of complexity theory. Health care change agents must understand chaos and complexity theory.
19. Alignment of finances with desired outcomes is essential in any change effort.
20. Leaders must maintain an unwavering focus on the end goal, despite being distracted by situational circumstances.

quality and better service becomes more intense for all health care providers, the prevalence of chronic diseases and conditions of senescence increases, new technologies demand new methods of treatment, and a greater proportion of VA's patients are older, female, and have severe mental health and/or severe multisystem injury from the current wars in Iraq and Afghanistan.

Perhaps most concerning about the system's future, however, is the competiton for funding, which it faces from mandatorily funded entitlement programs (primarily Medicare and Social Security) and payment on the national debt. As these expenditures consume an ever larger portion of the federal budget, it is unclear how discretionary programs like veterans health care will fare.

DISCLOSURE STATEMENT

The authors are not aware of any biases that might be perceived as affecting the objectivity of this review.

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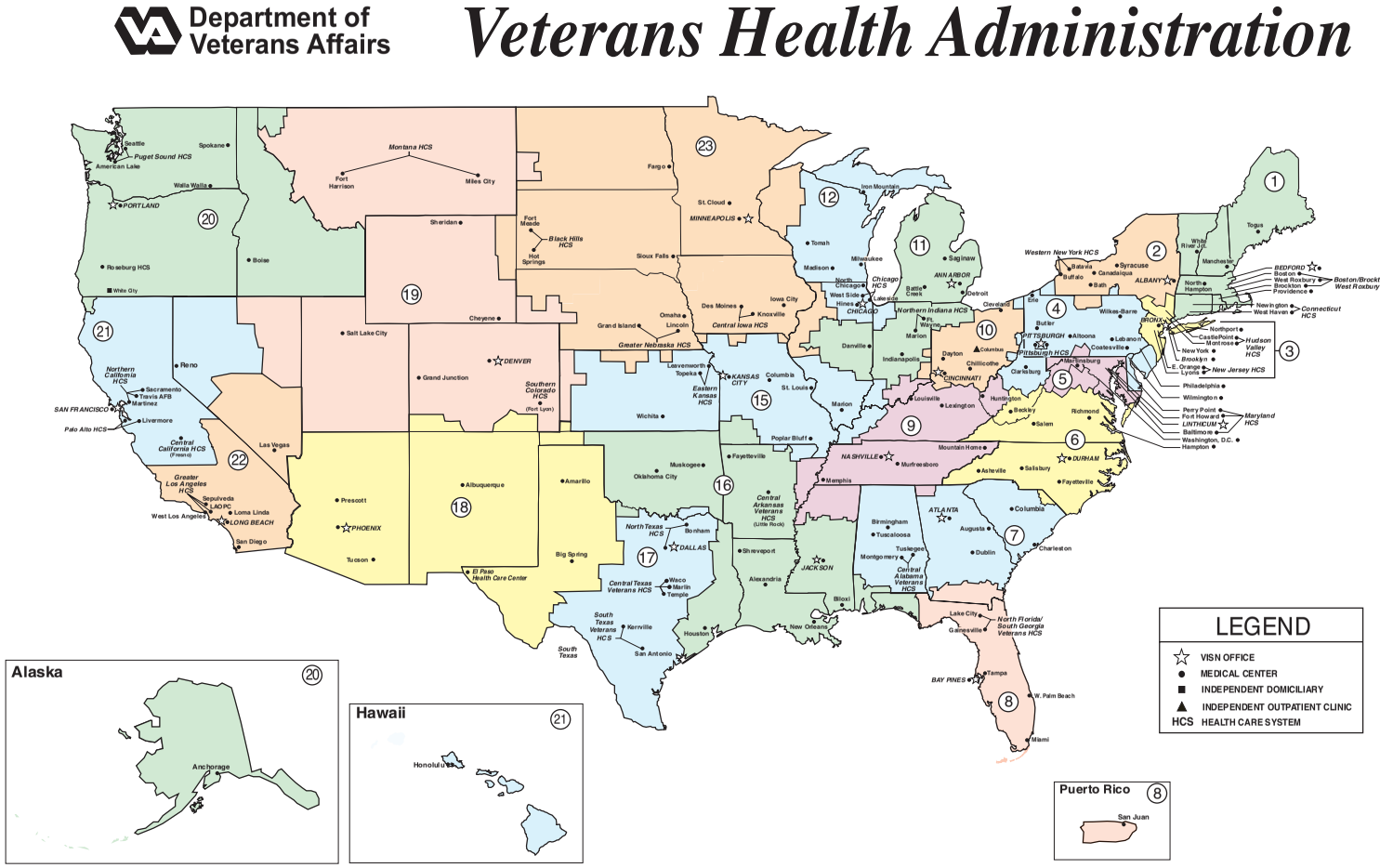

Figure 1

Map of the VHA's 21 veterans integrated service networks.

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