The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care

Framework for Strategic Action

July 21, 2004

Tommy G. Thompson
Secretary of Health and Human Services

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Secretary
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200 Independence Avenue, SW
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July 21, 2004

The Honorable Tommy G. Thompson
Secretary of Health and Human Services
200 Independence Avenue, SW
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Dear Secretary Thompson:

On April 27, 2004, President Bush called for the majority of Americans to have interoperable electronic health records within 10 years, and in doing so signed an Executive Order establishing the position of the National Coordinator for Health Information Technology. The National Coordinator was charged with developing, maintaining, and overseeing a strategic plan to guide nationwide adoption of health information technology in both the public and private sectors. The Executive Order also called for the National Coordinator to deliver a report on progress toward a strategic plan within 90 days of appointment.

As the nation's first National Coordinator, I am pleased to deliver that report to you. Since my appointment on May 6, 2004, I have worked with many federal agencies to develop a Framework for Strategic Action entitled, "The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care." This Framework outlines 12 strategies that will achieve four goals critical to the President's vision. These goals include: introduction of information tools into clinical practice, electronically connecting clinicians to other clinicians, using information tools to personalize care delivery, and advancing surveillance and reporting for population health improvement.

The President also directed the Department of Veterans Affairs, the Department of Defense, and the Office of Personnel Management to report on how they can advance the adoption of health information technology. Their reports are attached. Also attached is a comprehensive catalogue of identifiable federal health information technology programs. Together, the Framework and related reports represent the foundation for rapid adoption of health information technology across the nation.

Thank you for your strong leadership on health information technology. I would also like to thank agency heads and key staff for their efforts to develop and support the Framework for Strategic Action.

Regards,

David J. Brailer, M.D., Ph.D.
National Coordinator for Health Information Technology

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Preface

The Administration and the Department of Health and Human Services (HHS) have recognized the importance of fostering the development and diffusion of technology to improve the delivery of health care. Over the past few years the federal government and the strong, talented leadership of the private sector have made progress in setting the stage for transforming health care delivery through vastly improved use of health information technology (HIT).

In 1998, the National Committee on Vital and Health Statistics (NCVHS), a federal advisory committee composed of private sector experts, reported that the nation's information infrastructure could be an essential tool for promoting the nation's health in its seminal concept paper, "Assuring a Health Dimension for the National Information Infrastructure." Since that time, other initiatives have helped to further define the best approach to apply information and communication technologies to the health sector.

In 2002, the Markle Foundation organized a public-private collaborative, Connecting for Health, which brought together leaders from government, industry, and health care, and consumer advocates to improve patient care by promoting standards for electronic medical information. A year later, the collaboration of more than 100 public and private stakeholders achieved consensus on an initial set of health care data standards and commitment for their adoption from a wide variety of national health care leaders.

In March 2003, the Consolidated Health Informatics (CHI) initiative involving HHS, the Departments of Defense (DoD), and Veterans Affairs (VA), announced uniform standards for the electronic exchange of clinical health information to be adopted across the federal health care enterprise. These standards will facilitate information exchange, with privacy and security protections, to make it easier for health care providers to share relevant patient information and for public health professionals to identify emerging public health threats.

At the end of 2003, President Bush signed into law the Medicare Prescription Drug Improvement and Modernization Act (MMA) of 2003. Among other new initiatives, the law includes important provisions for HIT. MMA requires the Centers for Medicare and Medicaid Services (CMS) to develop standards for electronic prescribing, which will be a first step toward the widespread use of electronic health records (EHR). In addition, the MMA requires the establishment of a Commission on Systemic Interoperability to provide a road map for interoperability standards.

In April 2004, President Bush issued Executive Order 13335 calling for widespread adoption of interoperable EHRs within 10 years, and established the position of National Coordinator for Health Information Technology. The Executive Order signed by the President directs the National Coordinator to produce a report within 90 days of operation on the development and implementation of a strategic plan to guide the nationwide implementation of interoperable HIT in both the public and private sectors.

The President's Information Technology Advisory Committee (PITAC) in June 2004 issued a draft report, "Revolutionizing Health Care Through Information Technology," which stated that the overall quality and cost-effectiveness of U.S. health care delivery bear directly on three top national priorities of national, homeland, and economic security.

In July 2004, Connecting for Health released a timely report that details specific actions the public and private sectors can take to accelerate the adoption of information technology in health care. Connecting for Health's "Preliminary Roadmap for Achieving Electronic Connectivity in Healthcare" contains recommendations in three categories: creating a technical framework for connectivity, developing incentives to promote improvements in health care quality, and engaging the American public by providing information to promote the benefits of electronic connectivity and to encourage patients and consumers to access their own health information.

Collectively, these accomplishments have laid the groundwork for a widespread effort to drive adoption of interoperable HIT. This report, and the actions that will follow, will build upon this foundation to realize the vision for consumer-centric and information-rich care.

This report was published by the Office for the National Coordinator for Health Information Technology (ONCHIT), Department of Health and Human Services, and the United States Federal Government.

This report is intended to guide discussion and investigation so progress can be made towards widespread adoption of health information technology. This report does not constitute a change in policy nor does it call for statutory changes in its own right.

Specific reports by the Office of Personnel Management (OPM), Department of Defense (DoD), and the Department of Veterans Affairs (VA) that respond to the President's April 27, 2004, Executive Order are also included in this bound report.

The following staff should be acknowledged for their contribution to this report: Clay Ackerly, Kelly Cronin, Lori Evans, Arlene Franklin, Kathleen Fyffe, Natalie Gravette, Jennie Harvell, Mary Hollander, Lee Jones, Al Kaylani, Missy Krasner, Barbara Ricks, and Helga Rippen. The efforts of leaders and key staff from each federal agency involved with this report should be acknowledged.

Executive Summary

On April 27, 2004, President Bush called for widespread adoption of interoperable EHRs within 10 years, and also established the position of National Coordinator for Health Information Technology. On May 6, 2004, Secretary Tommy G. Thompson appointed David J. Brailer, MD, PhD, to serve in this new position. The federal government has already played an active role in the evolution and use of health information technology (HIT), including adoption and ongoing support for standards needed to achieve interoperability. Executive Order 13335 requires the National Coordinator to report within 90 days of operation on the development and implementation of a strategic plan to guide the nationwide implementation of HIT in both the public and private sectors.

In fulfilling the requirements of the Executive Order, this report outlines a framework for a strategic plan that will be dynamic, iterative, and implemented in coordination with the private sector. In addition, this report includes attachments from the Office of Personnel Management (OPM), the Department of Defense (DoD), and the Department of Veterans Affairs (VA). Collectively, this report and related attachments represent the progress to date on the development and implementation of a comprehensive HIT strategic plan.

Readiness for Change

There is a great need for information tools to be used in the delivery of health care. Preventable medical errors and treatment variations have recently gained attention. Clinicians may not know the latest treatment options, and practices vary across clinicians and regions. Consumers want to ensure that they have choices in treatment, and when they do, they want to have the information they need to make decisions about their care. Concerns about the privacy and security of personal medical information remain high. Public health monitoring, bioterror surveillance, research, and quality monitoring require data that depends on the widespread adoption of HIT.

Vision for Consumer-centric and Information-rich Care

Many envision a health care industry that is consumer centric and information-rich, in which medical information follows the consumer, and information tools guide medical decisions. Clinicians have appropriate access to a patient's complete treatment history, including medical records, medication history, laboratory results, and radiographs, among other information. Clinicians order medications with computerized systems that eliminate handwriting errors and automatically check for doses that are too high or too low, for harmful interactions with other drugs, and for allergies. Prescriptions are also checked against the health plan's formulary, and the out-of-pocket costs of the prescribed drug can be compared with alternative treatments. Clinicians receive electronic reminders in the form of alerts about treatment procedures and medical guidelines. This

is a different way of delivering health care than that which currently exists, but one that many have envisioned. This new way will result in fewer medical errors, fewer unnecessary treatments or wasteful care, and fewer variations in care, and will ultimately improve care for all Americans. Care will be centered around the consumer and will be delivered electronically as well as in person. Clinicians can spend more time on patient care, and employers will gain productivity and competitive benefits from health care spending.

Strategic Framework

In order to realize a new vision for health care made possible through the use of information technology, strategic actions embraced by the public and private health sectors need to be taken over many years. There are four major goals that will be pursued in realizing this vision for improved health care. Each of these goals has a corresponding set of strategies and related specific actions that will advance and focus future efforts. These goals and strategies are summarized below.

Goal 1: Inform Clinical Practice. Informing clinical practice is fundamental to improving care and making health care delivery more efficient. This goal centers largely around efforts to bring EHRs directly into clinical practice. This will reduce medical errors and duplicative work, and enable clinicians to focus their efforts more directly on improved patient care. Three strategies for realizing this goal are:

- *Strategy 1. Incentivize EHR adoption*. The transition to safe, more consumer-friendly and regionally integrated care delivery will require shared investments in information tools and changes to current clinical practice.
- *Strategy 2. Reduce risk of EHR investment*. Clinicians who purchase EHRs and who attempt to change their clinical practices and office operations face a variety of risks that make this decision unduly challenging. Low-cost support systems that reduce risk, failure, and partial use of EHRs are needed.
- *Strategy 3. Promote EHR diffusion in rural and underserved areas*. Practices and hospitals in rural and other underserved areas lag in EHR adoption. Technology transfer and other support efforts are needed to ensure widespread adoption.

Goal 2: Interconnect Clinicians. Interconnecting clinicians will allow information to be portable and to move with consumers from one point of care to another. This will require an interoperable infrastructure to help clinicians get access to critical health care information when their clinical and/or treatment decisions are being made. The three strategies for realizing this goal are:

- *Strategy 1. Foster regional collaborations*. Local oversight of health information exchange that reflects the needs and goals of a population should be developed.
- *Strategy 2. Develop a national health information network*. A set of common intercommunication tools such as mobile authentication, Web services architecture, and security technologies are needed to support data movement that is inexpensive and secure. A national health information network that can provide low-cost and secure data movement is needed, along with a public-private

oversight or management function to ensure adherence to public policy objectives.

- *Strategy 3. Coordinate federal health information systems*. There is a need for federal health information systems to be interoperable and to exchange data so that federal care delivery, reimbursement, and oversight are more efficient and cost-effective. Federal health information systems will be interoperable and consistent with the national health information network.

Goal 3: Personalize Care. Consumer-centric information helps individuals manage their own wellness and assists with their personal health care decisions. The ability to personalize care is a critical component of using health care information in a meaningful manner. The three strategies for realizing this goal are:

- *Strategy 1. Encourage use of Personal Health Records.* Consumers are increasingly seeking information about their care as a means of getting better control over their health care experience, and PHRs that provide customized facts and guidance to them are needed.
- *Strategy 2. Enhance informed consumer choice.* Consumers should have the ability to select clinicians and institutions based on what they value and the information to guide their choice, including but not limited to, the quality of care providers deliver.
- *Strategy 3. Promote use of telehealth systems.* The use of telehealth – remote communication technologies – can provide access to health services for consumers and clinicians in rural and underserved areas. Telehealth systems that can support the delivery of health care services when the participants are in different locations are needed.

Goal 4: Improve Population Health. Population health improvement requires the collection of timely, accurate, and detailed clinical information to allow for the evaluation of health care delivery and the reporting of critical findings to public health officials, clinical trials and other research, and feedback to clinicians. Three strategies for realizing this goal are:

- *Strategy 1. Unify public health surveillance architectures*. An interoperable public health surveillance system is needed that will allow exchange of information, consistent with current law, between provider organizations, organizations they contract with, and state and federal agencies.
- *Strategy 2. Streamline quality and health status monitoring.* Many different state and local organizations collect subsets of data for specific purposes and use it in different ways. A streamlined quality-monitoring infrastructure that will allow for a complete look at quality and other issues in real-time and at the point of care is needed.
- *Strategy 3. Accelerate research and dissemination of evidence.* Information tools are needed that can accelerate scientific discoveries and their translation into clinically useful products, applications, and knowledge.

Key Actions

The Framework for Strategic Action will guide the development of a full strategic plan for widespread HIT adoption. At the same time, a variety of key actions that have begun to implement this strategy are underway, including:

Establishing a Health Information Technology Leadership Panel to evaluate the urgency of investments and recommend immediate actions

As many different options and policies are considered for financing HIT adoption, the Secretary of HHS is taking immediate action by forming a Health Information Technology Leadership Panel, consisting of executives and leaders. This panel will assess the costs and benefits of HIT to industry and society, and evaluate the urgency of investments in these tools. These leaders will discuss the immediate steps for both the public and private sector to take with regard to HIT adoption, based on their individual business experience. The Health Information Technology Leadership Panel will deliver a synthesized report comprised of these options to the Secretary no later than Fall 2004.

Private sector certification of health information technology products

EHRs and even specific components such as decision support software are unique among clinical tools in that they do not need to meet minimal standards to be used to deliver care. To increase uptake of EHRs and reduce the risk of product implementation failure, the federal government is exploring ways to work with the private sector to develop minimal product standards for EHR functionality, interoperability, and security. A private sector ambulatory EHR certification task force is determining the feasibility of certification of EHR products based on functionality, security, and interoperability.

Funding community health information exchange demonstrations

A health information exchange program through Health Resources and Services Administration, Office of the Advancement of Telehealth (HRSA/OAT) has a cooperative agreement with the Foundation for eHealth Initiative to administer contracts to support the Connecting Communities for Better Health (CCBH) Program totaling $2.3 million. This program is providing seed funds and support to multi-stakeholder collaboratives within communities (both geographic and non-geographic) to implement health information exchanges, including the formation of regional health information organizations (RHIOs) to drive improvements in health care quality, safety, and efficiency. The specific communities that will receive the funding through this program will be announced and recognized during the Secretarial Summit on July 21.

Planning the formation of a private interoperability consortium

To begin the process of movement toward a national health information network, HHS is releasing a request for information (RFI) in the summer of 2004 inviting responses describing the requirements for private sector consortia that would form to plan, develop, and operate a health information network. Members of the consortium would agree to participate in the governance structure and activities and finance the consortium in an equitable manner. The role that HHS could play in facilitating the work of the consortium and assisting in identifying the services that the consortium would provide will be explored, including the standards to which the health information network would

adhere to in order to ensure that public policy goals are executed and that rapid adoption of interoperable EHRs is advanced. The Federal Health Architecture (FHA) will be coordinated and interoperable with the national health information network.

Requiring standards to facilitate electronic prescribing

CMS will be proposing a regulation that will require the first set of widely adopted e-prescribing standards in preparation for the implementation of the new Medicare drug benefit in 2006. When this regulation is final, Medicare Prescription Drug Plan (PDP) Sponsors will be required to offer e-prescribing, which will significantly drive adoption across the United States. Health plans and pharmacy benefit managers that are PDP sponsors could work with RHIOs, including physician offices, to implement private industry-certified interoperable e-prescribing tools and to train and support clinicians.

Establishing a Medicare beneficiary portal

An immediate step in improving consumer access to personal and customized health information is CMS' Medicare Beneficiary Portal, which provides secure health information via the Internet. This portal will be hosted by a private company under contract with CMS, and will enable authorized Medicare beneficiaries to have access to their information online or by calling 1-800-MEDICARE. Initially the portal will provide access to fee-for-service claims information, which includes claims type, dates of service, and procedures. The pilot test for the portal will be conducted for the residents of Indiana. In the near term, CMS plans to expand the portal to include prevention information in the form of reminders to beneficiaries to schedule their Medicare-covered preventive health care services. CMS also plans to work toward providing additional electronic health information tools to beneficiaries for their use in improving their health.

Sharing clinical research data through a secure infrastructure

FDA and NIH, together with the Clinical Data Interchange Standards Consortium (CDISC), a consortium of over 40 pharmaceutical companies and clinical research organizations, have developed a standard for representing observations made in clinical trials called the Study Data Tabulation Model (SDTM). This model will facilitate the automation of the largely paper-based clinical research process, which will lead to greater efficiencies in industry and government-sponsored clinical research. The first release of the model and associated implementation guide will be finalized prior to the July 21 Secretarial Summit and represents an important step by government, academia, and industry in working together to accelerate research through the use of standards and HIT.

Commitment to standards

A key component of progress in interoperable health information is the development of technically sound and robustly specified interoperability standards and policies. There have been considerable efforts by HHS, DoD, and VA to adopt health information standards for use by all federal health agencies. As part of the Consolidated Health Informatics (CHI) initiative, the agencies have agreed to endorse 20 sets of standards to make it easier for information to be shared across agencies and to serve as a model for the private sector. Additionally, the Public Health Information Network (PHIN) and the National Electronic Disease Surveillance System (NEDSS), under the leadership of the

Centers for Disease Control and Prevention (CDC), have made notable progress in development of shared data models, data standards, and controlled vocabularies for electronic laboratory reporting and health information exchange. With HHS support, Health Level 7 (HL7) has also created a functional model and standards for the EHR.

Public-Private Partnership

Leaders across the public and private sector recognize that the adoption and effective use of HIT requires a joint effort between federal, state, and local governments and the private sector. The value of HIT will be best realized under the conditions of a competitive technology industry, privately operated support services, choice among clinicians and provider organizations, and payers who reward clinicians based on quality. The Federal government has already played an active role in the evolution and use of HIT. In FY04, total federal spending on HIT was more than $900 million. Initiatives range from supporting research in advanced HIT to the development and use of EHR systems. Much of this work demonstrates that HIT can be used effectively in supporting health care delivery and improving quality and patient safety.

Role of the National Coordinator for Health Information Technology

Executive Order 13335 directed the appointment of the National Coordinator for Health Information Technology to coordinate programs and policies regarding HIT across the federal government. The National Coordinator was charged with directing HIT programs within HHS and coordinating them with those of other relevant Executive Branch agencies. In fulfillment of this, the National Coordinator has taken responsibility for the National Health Information Infrastructure Initiative (NHII), the FHA, and the Consolidated Health Informatics Initiative (CHI), and is currently assessing other health information technology programs and efforts. In addition, the National Coordinator was charged with coordinating outreach and consultation between the federal government and the private sector. As part of this, the National Coordinator was directed to coordinate with the National Committee on Vital Health Statistics (NCVHS) and other advisory committees.

The National Coordinator will collaborate with DoD, VA, and OPM to encourage the widespread adoption of HIT throughout the health care system. To do this, the National Coordinator will gather and disseminate the lessons learned from both DoD and VA in successfully incorporating HIT into the delivery of health care, and facilitate the development and transfer of knowledge and technology to the private sector. OPM, as the purchaser of health care for the federal government, has a unique role and the ability to encourage the use of EHRs through the Federal Employees Health Benefits Program, and the National Coordinator will assist in gaining the complementary alignment of OPM policies with those of the private sector.

Reports from OPM, DoD, and VA

The Executive Order also directs the OPM, the DoD, and the VA to submit reports on HIT to the President through the Secretary of Health and Human Services. These reports are included in this report as Attachments 1 through 3.

OPM administers the Federal Employees Health Benefits Program for the federal government and the more than eight million people it covers. As the nation's largest purchaser of health benefits, OPM is keenly interested in high-quality care and reasonable cost. The adoption of an interoperable HIT infrastructure is a key to achieving both. OPM is currently exploring a variety of options to leverage its purchasing power and alliances to move the adoption of HIT forward. OPM will be strongly encouraging health plans to promote the early adoption of HIT. Details on these options can be found in OPM's report, "Federal Employees Health Benefits Program Initiatives to Promote the Use of Health Information Technology" (Attachment 1).

The VA, collaboratively with DoD, provides joint recommendations to address the special needs of these populations (Attachment 2). As mirrored in the DoD Report (Attachment 3), these recommendations focus on the capture of lessons learned, the knowledge and technology transfers to be gained from successful VA/DoD data exchange initiatives, the adoption of common standards and terminologies to promote more effective and rapid development of health technologies, and the development of telehealth technologies to improve care in rural and remote areas.

The DoD has significant experience in delivering care in isolated conditions such as those encountered in wartime or overseas peacekeeping missions, which can be compared to the conditions in some rural health care environments. Examples of the technologies used in these conditions include telehealth for radiology, mental health, dermatology, pathology, and dental consultations; online personalized health records for beneficiary use; bed regulation for disaster planning; basic patient encounter documentation; pharmacy, radiology, and laboratory order entry and results retrieval for use in remote areas and small clinics; pharmacy, radiology, and laboratory order entry and results retrieval; admissions and discharges; appointments for use in small hospitals; and online education offerings for health care providers. Technology products, outcomes, benefits, and cumulative knowledge will be shared for use within the private sector and local/state organizations to help guide their planning efforts (see Attachment 3 for more details).

The VA's report, "Approaches to Make Health Information Systems Available and Affordable to Rural and Medically Underserved Communities" (Attachment 2), also highlights its successful strategy to develop high-quality EHR technologies that remain in the public domain. These technologies may be suitable for transfer to rural and medically underserved settings. VA's primary health information systems and EHR (VistA and the Computerized Patient Record System [the current system] and Health*e*Vet-VistA, the next generation in development) provide leading government/public-owned health information technologies that support the provision, measurement, and improvement of quality, affordable care across 1300 VA inpatient and ambulatory settings. The VA continues to make a version of VistA available in the public domain as a means of fostering widespread development of high-performance EHR systems. The VA is also

incorporating the CHI approved standards into its next-generation Health*e*Vet-VistA. Furthermore, the VA is developing PHR technologies such as My Health*e*Vet, which are consistent with the larger strategic goal of making veterans (persons) the center of health care. Finally, the VA's health information technologies, such as bar code medication administration, VistA Imaging, and telehealth applications, provide the VA with exceptional tools that improve patient safety and enable the increasingly geographically dispersed provision of care to patients in all settings. These and other technologies are proposed as federal technology transfer options in furtherance of the President's goals.

Conclusion

Health information technology has the potential to transform health care delivery, bringing information where it is needed and refocusing health care around the consumer. This can be done without substantial regulation or industry upheaval. It can give us both better care – care that is higher in quality, safer, and more consumer responsive – and more efficient care – care that is less wasteful, more appropriate, and more available. The changes that will accompany the full use of information technology in the health care industry will pose challenges to longstanding assumptions and practices. However, these changes are needed, beneficial, and inevitable. Action should be taken now to achieve the benefits of HIT. A well-planned and coordinated effort, sustained over a number of years, can deliver results that will better support America's health care professionals and better serve the public.

Addressing An Urgent Health Care Need

The U.S. health care system has a long and distinguished history of innovation. Basic research results are translated into new understanding of disease, better diagnostic tools, disease prevention, and innovative treatments. New therapies, procedures, and medications are the norm, and Americans have access to unparalleled standards of care and technologies that give them a continued stream of new treatment options, medications, and other therapies over their lifetimes.

At the same time, health care faces major challenges. Health care spending and health insurance premiums continue to rise at rates much higher than the rate of general inflation. Despite national health care spending of $1.7 trillion (Centers for Medicare and Medicaid Services, Office of the Actuary, 2004), concerns persist about preventable errors, uneven health care quality, and poor communication among physicians and hospitals. The Institute of Medicine (IOM) estimates that between 44,000 and 98,000 Americans die each year from inpatient medical errors. (Corrigan et al., 2000).

These problems – high costs, medical errors, variable quality, administrative inefficiencies, and lack of coordination – are closely connected to inadequate use of HIT as an integral part of medical care. The innovation that has made American medical care the world's best has not been applied to its health information systems. With this in mind, President Bush has made transforming health care through HIT a top priority for the United States. On April 27, 2004, the President announced his HIT initiative, setting a broad goal that most Americans should have electronic medical records within 10 years. This vision for the development and implementation of a nationwide interoperable HIT infrastructure was further detailed in Executive Order 13335, which also directed the appointment of a National Coordinator for Health Information Technology.

The National Coordinator will lead the nation's effort to achieve the common goal of using information technology to improve the affordability, safety, and accessibility of health care in America. The National Coordinator was directed to develop a nationwide strategic plan for HIT adoption. The strategic plan will guide federal agencies and the private industry in their efforts to develop and implement programs that will promote the adoption of interoperable HIT. A first step in preparing that strategic plan is the release of this framework. The National Coordinator and this strategic framework will serve to move the nation from a long period of contemplation about HIT to a vigorous stage of action and progress in the public and private sectors on this issue. The efforts described in this report are aimed at promoting a more effective marketplace, greater competition, and increased choice for consumers through wider availability of information on health care costs, quality, and safety.

This framework is intended to guide discussion, investigation, and experimentation so that progress can be made towards widespread adoption of HIT. This report does not constitute a change in policy, rule, or law, and does not call for statutory changes in its own right.

Readiness for Change in Health Care

Stakeholders involved in the delivery of health care in the U.S. recognize the critical role of HIT in making health care safer and more efficient by enabling complete, accurate, and timely information at the point of care for both clinicians and consumers. Each of these groups understands that HIT is critical to delivering safe, affordable, and consumer-oriented health care, as well as helping to mitigate public health and bioterror threats. This consensus results from the convergence of a variety of issues that shape the reality of health care today. Arising from this is a new paradigm for care that is built upon seven critical needs:

- Avoid medical errors;
- Improve use of resources;
- Accelerate diffusion of knowledge;
- Reduce variability in access to care;
- Advance consumer role;
- Strengthen privacy and data protection; and
- Promote public health and preparedness.

Each of these needs is summarized in the sections below.

Avoid medical errors

The IOM has estimated that 44,000 to 98,000 deaths occur each year as a result of preventable medical errors in hospitals. Additional research has shown that over 770,000 people are injured or die each year in hospitals from adverse drug events (Classen 1997, Cullen 1997, Cullen 1995). Consumers are vulnerable to errors when they receive care from multiple sites, so the lack of timely exchange of information has been a longstanding safety and quality concern among clinicians. Many new efforts are under way to evaluate and address medical errors, including the use of HIT, but new techniques and strategies are needed.

There is growing evidence that the use of HIT improves consumer safety, quality, and continuity of care. There is consistent evidence that errors can be reduced by the appropriate use of computerized provider order entry (CPOE) and decision support systems (DSS), particularly in the case of drug prescribing, dispensing, and administration. For example, at LDS Hospital in Salt Lake City, a CPOE system reduced adverse drug events by 75% (Evans et al., 1998). Also, at the Regenstrief Institute for Health Care in Indianapolis, researchers demonstrated that automated computerized reminders increased orders for recommended interventions from 22% to 46% (Overage et al., 1997). A 1998 systematic review of the literature assessing the effects of 68 computer-based clinical DSS demonstrated a beneficial impact on physician performance

in 43 of 65 studies, and a beneficial effect on patient outcomes in 6 of 14 studies (Hunt et al., 1998). A new pharmacy software system implemented by DoD in 2001 that integrates and reviews information from all sources prior to prescriptions being filled has eliminated over 100,000 adverse drug interactions.

Improve use of resources

The United States spent an estimated $1.7 trillion on health care in 2003, and increases in health care spending continue to surpass increases in the rate of inflation. As new treatments and diagnostic tools are developed, the population ages, and demand increases for more specialized and intensive services, America will need innovative cost-containment tools. Studies have shown that nearly 30% of health care spending, or up to $300 billion each year, is for treatments that may not improve health status, may be redundant, or may be inappropriate for the patient's condition (Wennberg et al., 2002, Wennberg et al., 2004; Fisher et al., 2003, Fisher et al., 2003).

Some studies estimate that HIT has the potential to reduce inefficient use of resources. These studies demonstrate that use of EHRs can reduce laboratory and radiology test ordering by 9% to 14% (Bates et al., 1999; Tierney et al.,1987, 1990), lower ancillary test charges by up to 8% (Tierney et al,. 1988), reduce hospital admissions, costing an average of $16,000 each, by approximately 2% (Jha 2001), and reduce excess medication usage by 11% (Teich et al., 2000). While these studies are encouraging, more work needs to be done to determine the economic benefits of HIT. This work is corroborated by findings in the DoD and VA, where the use of the CPOE has largely eliminated lost laboratory reports and pharmacy and radiology orders and the duplication of tests.

Two studies have estimated that ambulatory EHRs could potentially save $78 billion to $112 billion annually, across all payers. This estimate includes $44 billion in annual savings from ambulatory EHRs (Johnston, et al., 2003) and $78 billion annually from interoperability of those EHRs, totaling $112 billion per year (Pan et al., 2004). There is also evidence that EHRs can reduce administrative inefficiency and paper handling (Khoury, 1998). These studies, while limited in number and scope, suggest that economic benefits of HIT could be large, and that further work is needed to determine the magnitude of these benefits.

Accelerate diffusion of knowledge

Medical knowledge is rapidly changing from breakthroughs, such as those in molecular biology, that accelerate the introduction of new medications. However, even well-synthesized knowledge faces many hurdles to being used in clinical practice. Estimates are that, on average, it takes 17 years for evidence to be integrated into clinical practice (Balas et al., 2000). Because of the enormous amount of information available, health care professionals find it increasingly difficult to keep current with new findings in their clinical practices. Research has shown that physicians incorporate the latest medical evidence into their treatment decisions 50% of the time (McGlynn et al., 2003).

When clinical knowledge is coupled with HIT through electronic reminders and other context-sensitive workflow, positive changes in practice have been observed. For example, a health information system used more than 20 years ago at Massachusetts General Hospital showed improved quality of care when reminders were provided to physicians (Barnett et al., 1978). Other studies have suggested that physicians who receive electronic clinical reminders follow medical evidence more frequently than physicians who do not receive these reminders. (AHRQ, Research in Action, 2002.)

Reduce variability of care

Many studies have demonstrated that geographic location is a strong determinant of specialty care access and procedural decision making (Wennberg et al., 2002). These variations in regional patterns are principal determinants of differences in health status across rural and urban populations.

While specialty care oversupply in urban areas is linked to higher costs, rural areas lack specialists. Advances in telehealth allow physicians to consult each other or to communicate with patients and remotely perform other diagnostic and therapeutic services. These technologies allow patients to be seen by the best specialist for their illness, regardless of where they live. They also enable physicians in rural and underserved areas to keep their knowledge current via distance education. Telehealth projects in such areas as home health and chronic disease management have shown significant cost savings for health care systems. Therefore, improvements in the use and commonality of information technology should only further improve the practice of telemedicine.

Advance consumer role

Consumer expectations for health care are particularly important in today's environment. Consumers often lack information to understand their treatment choices or to select physicians and other clinicians appropriate for their needs, and they do not like to fill out forms with repetitive information. Consumers report that they often do not feel that they are the principal decision maker for their health care and may feel instead that critical choices are being made by their clinician or their health plan.

Advances are being made in bringing consumers directly into decision-making roles regarding their care, many using HIT. One study (Fox et al., 2003) reported that 52 million Americans access health or medical information on the Web. Increasingly, consumers are accessing health information via the Web. The National Library of Medicine's MEDLINE is accessed by consumers as frequently as by health care professionals and researchers. Consumers most commonly use MEDLINE to access information about specific conditions or diseases (e.g., diabetes, asthma, cancer, etc.) and medications (e.g., Celebrex).

Within the federal government, the VA is beginning to engage veterans by providing them with a personal health record (PHR) called My Health*e*Vet. My Health*e*Vet is a

secure, Web-based PHR system that allows veterans access to key parts of their VA health record and to view and update their own health information. The DoD also provides a similar resource with TRICARE Online (TOL). TOL is the enterprise-wide, secure Internet portal that is used by DoD beneficiaries, providers, and managers worldwide to access available health care services, benefits, and information.

Consumers are also beginning to have access to information about the performance of their clinicians so that they can select those who best meet their needs. For example, CMS now provides consumers with information about the quality of nursing home and home health providers, and is working to make hospital quality measures available as well. The National Committee for Quality Assurance (NCQA), through its online tools, posts comparative information about physicians, health plans, hospitals, and other providers.

Strengthen privacy and data protection

Since the enactment of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), there has been heightened awareness by stakeholders of the need for strong privacy and security protections for identifiable health information. Federal standards adopted pursuant to HIPAA for privacy and security protections for individually identifiable health information have and will continue to strengthen the privacy and security of health information within the health care industry and to prevent potentially harmful practices and the effects of the inappropriate disclosure of this information. With the increasing use of HIT to manage and exchange information in the clinical setting, maintaining and improving consumer confidence in the privacy and security of their health information will continue to be essential to the success of these efforts.

HIT, despite fear that it poses risks for the dissemination of health information, may in many ways provide better controls over information by providing more privacy and security for health information than paper-based medical records. Efforts to protect paper records may come at the cost of the portability. However, EHRs have the potential to provide a less burdensome means of meeting HIPAA privacy and security standards of providing and limiting access to records and of tracking who has had access to consumer information on an individual's specific health record. Building on these, the VA and the DoD are actively collaborating on enhancing security standards that enable the protection and security of health data, including identification, confidentiality, integrity, authentication, and certification. The baseline for this security was laid out in the HIPAA security rule.

Promote public health and preparedness

Whether in response to disease outbreaks spread through global travel or declining immunity, or from man-altered pathogens that intend to produce disease and death, the ability to monitor and react to outbreaks is important. However, much real-time information is needed to detect and pinpoint an outbreak, and this information requires marked changes in how health care information is collected, stored, and exchanged.

There have been significant improvements in preparedness. Substantial investments are being made to get health information for public health and preparedness. DoD is providing discrete and aggregated data and forwarding diagnosis information to the Centers for Disease Control and Prevention (CDC) for study and analysis. In an average week, DoD forwards the ICD-9 and geographic information for 890,000 medical encounters, enhancing the CDC's ability to perform symptom surveillance in support of homeland defense and public health.

Vision for Consumer-centric and Information-rich Health Care

The President has set an overarching vision for improving the quality, safety, and service of health care, and also for using health care resources more efficiently. This vision can be realized by making the health care industry consumer-centered and information rich, where information that is required for good decision making is available whenever and wherever care is provided. To do this, consumer information needs to follow the consumer. Basic information such as past medical history, laboratory results, radiographs, and current diagnoses, as well as history of medications and treatments, should all be available at the bedside or in the physician's office at the time of care. This information would be available to consumers and clinicians at the point of care whenever and wherever they need them and no matter where it was originally gathered. . Sophisticated decision-support tools that help identify treatments that are best suited to a given patient would be available to help reduce unnecessary treatments and to ensure prevention procedures, both of which result in better outcomes. Medications would be ordered with computerized systems that eliminate handwriting errors and automatically check for doses that are too high or too low. Information tools would also search for harmful interactions with other drugs and for allergies. Prescriptions would be checked against the health plan's formulary, and the out-of-pocket costs of the prescribed drug would be compared with alternative medications. Patient information would be readily available for clinicians at the point of care and would help patients improve their own care.

This is a different way of delivering health care that which currently exists, but one that many have envisioned. In this health care system, everyone will benefit by:

- **Fewer medical errors.** People being treated for an illness would not have to face the risk of being harmed by an error. The majority of medical errors would be prevented. Physicians and other authorized clinicians would be able to get up-to-date information on their patients and would have instant access to breaking news in science and research, and to medical guidelines for treatment. They would know which treatments are the most beneficial to their patients at the time they were making their clinical decisions. Overall, clinicians would be able to spend the majority of their time supporting and treating their patients, and not looking for information, waiting for returned phone calls, or facilitating administrative functions to deliver care.
- **Less variation in care.** Consumers would be able to access and compare the quality of clinical services regardless of their geographic location, socioeconomic status, disease condition, or disability. This health care would be culturally

sensitive, technologically advanced, and would emphasize timely access to specialists and enhanced clinical decision support so that no consumer or family would experience unnecessary delays in access to care.

- **Consumer-centered care.** Consumers would have ready access to their personal medical information, as well as details on the cost, quality, and service ratings of the care they were receiving or seeking.. This type of information would maximize consumer choice and involvement in health care and treatment decisions. Consumers would also be able to access their treatment information so that they could make better decisions and take more control over their health status, maintenance, and treatments. Patients could specify their treatment preferences and make these preferences readily available to authorized care providers.
- **Medical information moves with consumers.** As they move from clinician to clinician, patients' information would move seamlessly with them. Clinicians would be optimally informed about their patients, and patient care would not be interrupted or compromised. This would reduce the need for duplicate tests and redundant orders, and eliminate clinical guesswork when a new patient receives treatment.
- **Care is delivered electronically as well as in person.** As clinical practice enters into the information technology age, information should be available to clinicians whenever and wherever it is needed. Telemedicine should be used to enhance access to the best specialists when they are needed for a specific disease or treatment.
- **Medical records are protected from unauthorized access.** An information-rich health care system will make information electronically available that can support treating patients, making information accessible for public health and research, and improving care for all. This information has been and will be safeguarded in order to prevent unauthorized access to personal health data and to prevent improper uses and disclosures of individually identifiable information. This information would then be used for quality improvement, health services, scientific and genomic research, biosurveillance and response, and disaster recovery activities.
- **Clinicians can spend more time on patient care.** Clinicians should be able to focus on care delivery. Care delivery will be enriched by having the most relevant information – including up-to-date medical evidence – at the point of care. Clinicians and consumers will have more time together free of distractions such as searching for traditional paper records. The reporting that every clinician has to do should be accurate and timely, but also simple and automated. The data needed to conduct research on health care improvement, improve quality and efficiency, and monitor disease outbreaks should be available with little work and distraction to clinicians.

The steps that need to be taken across the nation are already under way in some places. In the past three years, many communities, hospitals, clinicians, and consumer groups have taken the initiative and demonstrated breakthroughs in improving the health care system. In these communities, even at this early stage, the process of health care is being

modernized – and the experiences of both clinicians and consumers are better because of the changes. Here are some examples:

- When arriving at a physician's office, a new patient does not have to enter his or her personal information, allergies, medications, or medical history, since this information is already available.
- A father, who previously had to carry his chronically ill daughter's medical records and x-rays in a large box when seeing a new consultant, can now keep his daughter's important medical history on a key chain drive that plugs into a USB port on a computer.
- Arriving at an emergency room, a senior citizen with chronic illness and memory difficulties authorizes her physicians to access her medical information from a recent hospitalization at another facility, thus avoiding a potentially fatal drug interaction between the planned treatment and the patient's current medications.
- While at home, a physician receives a call from a worried mother about her infant son and can access, via a secure network, recent lab tests and x-rays online instantly, avoiding a trip to the emergency room.
- While with a patient, a physician enters a prescription on a computer, where potential allergies and contraindications are shown immediately, and managed care authorization occurs instantly.
- Clinicians in rural emergency departments routinely send radiology studies to university radiologists and receive telephone consultation regarding these studies within minutes.
- Because of worsening angina, a senior citizen is being evaluated by her physician, who decision support to augment clinical decision making, and concludes that the patient's life expectancy would be safely extended by angioplasty.
- At home, a senior citizen consults an online database of physicians to assist in choosing a physician to perform an angioplasty for her angina.
- An intensive care specialist remotely monitors intensive care units in several different hospitals, providing coverage 24 hours a day, 7 days a week, reducing mortality, length of stay, and total cost of the ICU stay.
- A small number of cases of an unusual, sudden-onset fever and cough are instantly reported to public health officials from area emergency rooms, alerting authorities of a possible disease outbreak.
- A busy professional with a skin rash uses his health plan's consumer health portal to securely e-mail his clinician, who recommends that the patient schedule an appointment to be evaluated in person.
- A soldier returning home from Iraq undergoes a standardized health assessment. This information is collected with a personal digital assistant device and sent electronically to a central database, where it will be available for review and ongoing care in the decades to come by DoD and VA medical providers.

Automation of the health care industry through widespread use of HIT is a unique means of improving quality and reducing costs at the same time. HIT is also critical to transforming how health care is delivered. It could allow a real market to develop that would reward innovations in care delivery, make the health care system more responsive

to consumers, and involve consumers much more actively in their own health and health care.

Framework for Strategic Action

Health care that is consumer centered and information rich requires a sustained set of strategic actions, embraced by both the public and private health sectors, that need to be taken over many years. Four major goals that will be pursued in realizing this vision for improved health care are:

- Inform clinical practice;
- Interconnect clinicians;
- Personalize care; and
- Improve population health.

The following framework describes each of these goals, along with strategies that will be followed to realize the goal and specific actions that pragmatically advance toward the goal. As this framework evolves into a full strategic plan, goals and strategies will be updated and a variety of new specific actions will be implemented.

Inform clinical practice

Fundamental to the goal of improving care and making health care delivery more efficient is providing complete and useful patient information and knowledge to clinicians when and where they need it and in a manner linked to selection and ordering of tests or therapies for patients. Information technology can enable this end-to-end approach to clinical decision making. To do this, several needs must be met.

Information technology products that work within the unique environment of health care should be further innovated. This is particularly true for the EHR, which has the potential to deliver substantial value but which relies on a unique relationship between a clinician and information technology. Better information about the characteristics of EHRs will allow for a marketplace where clinicians will better understand their needs and the options available. A stronger business case for EHRs among physician buyers is required to offset the disincentives for quality and efficiency in current reimbursement. Furthermore, clinicians who care for underserved populations, including rural areas, require special consideration to ensure that they can make the requisite investments and encourage regional referral centers to similarly invest in compatible technology.

There following three strategies will enable realization of the goal of informing clinical practice:

- Incentivize EHR adoption;
- Reduce the risk of EHR investment; and
- Promote EHR diffusion in rural and underserved areas.

Incentivize EHR adoption

There are high expectations about the benefits that will be derived from using electronic medical records, computerized order entry, and other components of the EHR. Evidence is well documented that EHRs can improve patient health status (Kohn, 2000). Several studies have demonstrated that EHRs can reduce errors and improve use of medical evidence (Kuperman, 2003; Bates et al, 1998; Balas et al, 2000). There is a belief that EHRs will induce concomitant changes in workflow, in relationships between physicians and patients, and in process control that together will trigger subsequent waves of positive change, moving health care toward a more modern and consumer-driven model.

A large gap remains, however, between the promise of EHRs and the capacity and willingness of clinicians to use them. Data from EHR adoption studies show only modest rates of EHR adoption by hospitals and physician groups. Thirteen percent of hospitals in 2002 reported that they used EHRs (HIMSS 2002). Physician office EHR use rates reported in 2002 ranged from 14% to a possible high of 28% of practices (Loomis et al, 2002; HIMSS, AstraZenca, 2002). The most commonly cited barrier to implementation of EHRs is insufficient resources or a negative return on investment associated with its purchase, implementation, and operation. Because of these concerns, the use of EHRs remains low, and forecasts do not show substantial trends in adoption over the next few years.

Many health system and physician decision makers believe that EHRs are bad financial investments, even if they are also business expenses made necessary by the mission of their organizations. Despite the long-term benefits realized by patients, payers, purchasers, and society as a whole, physician groups and hospitals may be making rational economic decisions when they choose not to invest in EHRs. Hospital and physician investments in EHRs are costly, pose substantial risks, and have few benefits for economic buyers, suggesting that EHR demand is low because the total cost of ownership (purchase price, plus implementation, plus maintenance, plus impact on operations) is unaffordably high.

Some of the concerns around EHR adoption are centered on cost because of the upfront investment needed for technology and infrastructure, and also because of the high costs of managing concomitant clinical and administrative changes. These changes are risky because the implementations may not succeed, and also because the EHR-driven changes in workflow, communication, and decision making threatens physicians and could upset the delicate balance between physicians and hospitals, as well as among physicians themselves. Some believe that EHRs deliver only a small fraction of their potential benefits because the fragmented and volume-based model of health care financing in the United States rewards physicians and hospitals for transactions rather than for patient health status and quality.

Current adoption of EHRs demonstrates that at least some organizations are realizing positive economic returns on EHR use, or that they do not require a positive return on investment to justify purchasing an EHR. The latter organizations may place a high

financial value on the quality or safety benefits to patients, essentially choosing to fund a positive externality in order to fulfill their mission, or they may derive a return from strategic positioning or market differentiation. However, there are very few physician groups or hospitals in the United States able to sustain high capital expenses or operating losses over the long term simply because of mission or strategy. For the rest, short-term finances will determine whether they invest in EHRs.

EHRs are a unique category of technology procured by physicians and health systems. Like MRIs, for example, they collect a variety of data, summarize data with algorithms, store and communicate data, and present data in a manner meaningful to clinicians. Both MRIs and EHRs provide information that supplements diagnostic decision making, refines choice of treatment, and supplements monitoring of patient progress over time. Neither is useful or reliable without a physician's guidance and oversight. Both can harm patients if overused, underused, or used improperly, or if they do not perform as promised, whether through malfunction, poor maintenance, or design defect. Like MRIs, EHRs are very expensive to purchase and operate and have an extended payback period. However, EHRs are different from an MRI machine, and nearly every other clinical technology, in one notable way: EHRs evolved incrementally into clinical tools from their administrative office tool roots, and only recently has sufficient evidence of EHR benefit to patient health status been compiled.

Incentives that might induce EHR adoption or quality and other clinical benefits have been discussed for some time. Incentives as a means of stimulating EHR adoption may overlook the technical, cultural, and operational barriers to EHR adoption and use. Non-financial barriers should and are being addressed. In addition, options for reducing the financial disincentives to EHR adoption could also be explored. Options should meet at least the following four criteria:

- Business case improvement. Policy options should consider, in part, the economic expense borne by a hospital or physician when purchasing or using an EHR.
- Compatibility with existing programs and regulations. Policy options for EHR adoption should be compatible with or incrementally build on existing reimbursement and regulations.
- Budget cost-effectiveness. Policy options should be cost-effective and deliver the largest impact for the smallest expenditure.
- Stakeholder alignment. Policy options should align physicians, hospitals, and other stakeholders toward a common goal of improving quality and efficiency.

HHS will examine many potential policy options for incentivizing EHR adoption, including those that might require statutory or regulatory changes for full implementation. Among these are the following:

Regional grants and contracts. HHS will further explore how grants and contracts could be made available to regions, states, or communities for EHR adoption and health information exchange. In addition to stimulating EHR adoption, this mechanism could foster creation of local infrastructures that could support deployment of EHRs and

oversee data exchange across settings of care. This may improve the business case for EHR adoption by physicians and other health care providers and might direct some of this investment into regional organizations as well. Up to five state and regional HIT demonstration projects will be funded by the Agency for Healthcare Research and Quality (AHRQ) in FY04, and an additional $50 million is in the FY05 budget request for HHS to continue the support of such projects. This mechanism could align community stakeholders toward a common goal of health care improvement.

Improve the availability of low-rate loans for EHR adoption. The federal government could identify possible incentives for the banking and loan industry to provide low-rate loans to clinicians and providers that are investing in EHR adoption. This could include reducing or removing impediments or barriers to providing such loans.

Update federal physician self-referral and anti-kickback protections. The physician self-referral prohibition and the anti-kickback statute provide important protection against fraud and abuse, assuring that taxpayer and beneficiary dollars are spent appropriately and preventing patient harm. However, these statutes did not anticipate interoperable HIT that necessarily involves relationships among different providers. While the in-kind provision of EHRs, hardware, or support by hospitals and other providers or suppliers to physicians could accelerate physician adoption of EHRs, this action could face unintended conflicts with the physician self-referral prohibition and the anti-kickback statute in some circumstances. HHS could explore safe harbors or exceptions to these laws that could accelerate EHR adoption without creating inappropriate conflicts of interest or potential for abuse.

Pay for use of EHR. There are two general approaches being explored to reimburse clinicians for the use of EHRs that are consistent with current Medicare law. Under the physician fee schedule, CMS could consider payment for specific EHR uses though the use of new codes or modifiers based on the best estimate of the incremental, amortized costs actually incurred by physicians nationwide who use EHRs. Demonstration projects could test alternative EHR payment methods, such as direct contracts with physicians, and determine whether certain EHRs functionalities or other capabilities could be incentivized.

Pay-for-performance programs. Pay-for-performance would reward clinicians for delivering the best quality of care, not the highest volume of care. CMS, under its demonstration authority, has the ability to design, implement, and evaluate pay-for-performance programs, above and beyond those planned as a part of implementation of MMA. It remains unclear how strongly pay-for-performance programs would accelerate EHR adoption, but the effect will likely be dependent on the program design and the inclusion of specific EHR criteria within the program. If designed to enable the clinician to develop quality management capabilities before stringent performance accountability, pay-for-performance programs could enhance EHR adoption and also ensure realization of the quality and efficiency value it brings.

While further analysis and review is needed, it is possible that one or more of these mechanisms (or others) could be employed by HHS to stimulate EHR adoption. These incentives could be aimed at institutions, clinicians, or both. Clinicians are known to be reluctant to adopt EHRs, and hospitals report substantial barriers to EHR adoption that arise from physician resistance. Despite their management depth, capital availability, and technology experience, hospitals are to some degree dependent on the general views of clinicians toward EHRs. Therefore, incentives aimed at professionals might be helpful to EHR adoption in physicians' offices and other ambulatory care sites, but also in hospital and other institutional settings as well.

In order to better understand the value of these options from a societal and industry perspective, the Secretary of HHS will take immediate action and convene a Health Information Technology Leadership Panel, consisting of executives and leaders. This panel will assess the costs and benefits of HIT to industry and society, and evaluate the urgency of investment in these tools. These leaders will discuss the immediate steps for both the public and private sector to take with regard to HIT adoption. The Health Information Technology Leadership Panel will deliver a report to the Secretary no later than Fall 2004.

In addition, HHS and OPM are participating in the recently formed National Alliance for Health Care Information Technology Advancement. The Alliance is comprised of purchasers and payers representing almost 200 million covered persons. It will work together to accomplish the following goals:

- Identify financial and non-financial incentives that would lower some of the current barriers to HIT adoption and use, while recognizing potential cost implications for all stakeholders.
- Explore avenues to share standardized data and contribution to electronic PHRs.
- Build on the collaborations between all parties to support each other in the adoption and implementation of this initiative to advance the quality, safety, and efficiency of health care.

HHS will work closely with the Alliance during the next 90 days to identify specific strategic actions to meet these goals.

Beyond its role as a payer, the federal government operates large care delivery networks for active military, their families, and retirees through DoD, for eligible veterans through VA, and for American Indian/Alaska Native people through the Indian Health Service (IHS.) As a purchaser of clinical services, the federal government contracts with private sector providers to deliver care to eligible beneficiaries. For VA, these contracts are primarily in the area of nursing home and rehabilitative care. The VA recognizes strong similarities between the use of incentives within contracting and those within reimbursement, so it will align its contract incentives with the reimbursement incentives as established by the private and public sectors. IHS has begun leveraging its buying power with two major contractor reference laboratories to ensure that Health Level 7 (HL7) messaging standards are incorporated to ensure bi-directional electronic transfer of laboratory orders and results. DoD continues to work closely with the health services and

support contractors in the areas of privacy, security, and the trusted exchange of health information. DoD will also solicit industry's input regarding potential contracting incentives. DoD has already developed contract language to encourage the electronic reporting of health data and will consider using the electronic sharing of health data in future contract evaluation criteria. The full VA report is included as Attachment 2 and the DoD report is included as Attachment 3.

As the nation's largest employer purchaser of health care benefits for more than 8 million people across the United States, the federal government has a strong interest in ensuring high-quality care for its employees and annuitants at a reasonable price. OPM is exploring a variety of options to leverage its purchasing power to support EHR adoption by the providers and networks that deliver services to federal employees, annuitants, and their covered family members. OPM will be strongly encouraging health plans to promote the early adoption of HIT. The report from OPM is presented in Attachment 1.

Reduce risk of EHR investment

Clinicians who purchase an EHR and who attempt to change their clinical practices and office operations face a variety of risks that make this decision unduly challenging. Implementation failure and partial use of EHRs are commonplace. Even if EHRs are implemented, there is no guarantee that they will be used and therefore lead to value for clinicians, consumers, or payers. Failed EHR implementation dissipates investment capital and leads to cynicism and fear among those who may want to bring their practices into a more modern era.

Implementation risks and the lack of value realization from EHRs limits growth and sustainability of the private market for health care information technology. Both buyers and sellers can benefit from institutions and agents that support physician buyers when they deal with highly capitalized technology companies. These institutions can mitigate the risk of EHR implementation failure and can also affect information asymmetry between clinicians and vendors when EHRs are being marketed. This will result in more cost-effective EHR adoption, less risk-adverse buyers, and a faster-growing and more attractive market for investments in HIT.

There are many causes of the risks associated with EHR implementation. One is that clinicians lack affordable and skilled support to assist in implementation and workflow change. Clinicians need ongoing technical assistance on how to reorganize office workflow processes to integrate and utilize EHRs to improve the quality, safety, efficiency, and cost in managing care. Support is needed for a wide variety of information tools, including registries, e-prescribing, e-labs, PHRs, and a fully integrated EHR. However, since many physicians are in small practices that may lack capital and spend relatively small sums on EHRs, they cannot easily find these services. ONCHIT will encourage private sector organizations to evaluate potential vehicles to provide this support on a cost-effective and trusted basis.

Another risk is faced in product selection. EHRs and even specific components such as decision support software are unique among clinical tools in that they do not need to meet minimal standards to be used to deliver care. To increase uptake of EHRs and reduce the risk of product implementation failure, the federal government is exploring ways to work with the private sector to develop minimal product standards for EHR functionality, interoperability, and security that will be tied to financial incentives. A private-sector, ambulatory EHR certification task force is determining the feasibility of certification of EHR products based on functionality, security, and interoperability. This task force will determine the governance structure for the certification entity that represents the various participants in EHR adoption. It will also identify minimal requirements for portable, secure, and interoperable health information and develop mechanisms for evaluating products against these criteria.

Promote EHR diffusion in rural and underserved areas

A gap in EHR adoption between urban and rural practices has been documented. Organizational size appears to influence EHR adoption (Lorence et al, 2002) in both inpatient and ambulatory settings. Urban practices capture 30% more patient information electronically than do rural practices. Interventions that increase overall EHR uptake may widen this gap unless protections are established for practices and hospitals in rural and other underserved areas. This could result in divergent standards of care based on availability of EHR technology.

The federal government will explore how to address the barriers to EHR adoption in rural and underserved areas by using its buying power and specialized technology to improve the access to EHRs. DoD and VA operate the largest health care delivery networks in the nation. VA has significant experience in delivering care to rural and historically underserved veteran populations. DoD has significant experience in delivering care in isolated conditions such as those encountered in wartime or overseas peacekeeping missions, which can be compared to the conditions in some rural health care environments. Furthermore, the need for DoD to transport data to other facilities or providers may be similar to the situation with migrant workers. As purchasers of health care delivery products and services, these departments have significant experience in developing health care information technology acquisition strategies, performance-based contracts, negotiated volume discounts, and contract management. DoD and VA will draft templates of standard contract language for use nationally that will encourage industry to produce products and services that are scalable and applicable to the private sector. When selecting potential contractors, acquisition selection criteria could be developed that favorably consider those companies that agree to provide products and services applicable to targeted communities such as rural and underserved areas.

To meet the existing business needs of reaching geographically distanced providers and consumers, the VA has become a leader in the field of telehealth and telemedicine. VA's strategy for the expansion of telehealth could not take place without the presence of the VistA computerized patient record system. Within VA, there is a uniformity of opinion that the future of telehealth is within the context of a multimedia patient record. The

driver for these innovations in VA is not primarily technological; it is instead that technology is serving how VA meets the changing nature of the health needs of veterans.

VA is working with HHS to transfer HIT to the private sector. CMS is funding and collaborating with VA and other key federal agencies on the development of a "VistA-Office EHR" version of the VistA system for potential use in clinics and physician offices. An overriding goal of VistA-Office EHR is to stimulate the broader adoption and effective use of EHRs by making a robust, flexible EHR product available in the public domain. The first version of VistA-Office EHR is expected to be available in 2005. The system will be made available under the Freedom of Information Act, and may be used by commercial EHR vendors or installed directly by health care providers. Further details of VA activities are reported in Attachment 2.

DoD has significant experience in delivering care in isolated conditions such as those encountered in wartime or overseas peacekeeping missions that can be compared to the conditions in some rural health care environments. Examples of the technologies used in these conditions include: telehealth for radiology, mental health, dermatology, dental, and pathology consultation; online PHRs for beneficiary use; bed regulation for disaster planning; basic patient encounter documentation; and pharmacy, radiology, and laboratory order entry and results retrieval for use in remote areas and small clinics. The full DoD report is presented in Attachment 3.

IHS can provide another alternative for rural and safety net sites through the next generation of the Resource and Patient Management System (RPMS) EHR system. Through support from AHRQ, the new RPMS will have an improved graphical-user interface that will significantly enhance the functionality of the system. Since the IHS system is extensively used in small and rural communities, it has many features that would support its use in other safety net communities. In addition, since the IHS provides care across the life continuum, many functionalities for women and children are already available.

Interconnect clinicians

Without an interoperable infrastructure to allow for the secure movement of health information, the adoption and use of EHRs will not realize their full benefits. Indeed, non-interoperable EHRs could actually impede access and harm care by protecting information silos and proprietary control over populations to limit mobility of patients. Therefore, it is essential that EHRs are interoperable so that data are portable and can follow patients as they move through care settings.

An interoperable infrastructure requires coordinated and secure health information exchange, including the business, governance, and technical delivery mechanisms to support it; a set of intercommunication tools, and services for common architecture development; the diffusion of product standards into deployed products; privacy and security assurances; and connectivity infrastructure. Development of this infrastructure is a vital national priority and will require vehicles that can support public and private

sector investments. An interoperability infrastructure will accelerate the adoption of EHRs, as well as their use in a way that benefits consumers, purchasers, and society as a whole.

The following three strategies for achieving the goal of interconnecting care are detailed below:

- Foster regional collaborations;
- Develop a national health information network; and
- Coordinate federal health information systems.

Foster regional collaborations

The development, implementation, and application of secure health information exchange across care settings requires a local leadership, oversight, fiduciary responsibility, and governance. These regional health information organizations (RHIOs) are critical to health information exchange that reflects the health care priorities of a local area as well as the legitimacy and trustworthiness of this activity to clinicians and consumers.

While a few regions, states, or local areas have collaboratives that operate as governance entities, such as the Indiana Health Information Exchange, The Share Health Information Across Regional Entities project in Massachusetts, and the Santa Barbara County Care Data Exchange, there is no systematic basis for regional organization that can serve the nation's health information exchange goals. These local or regional initiatives are under way and increasing in number, but they lack coordination, involve poorly funded early stage projects, are highly variable, and have not produced a sustainable business model for other regions.

The Foundation for eHealth Initiative's Connecting Communities for Better Health Program, based on a widely disseminated request for capabilities funded by the Health Resources and Services Administration, Office of the Advancement of Telehealth (HRSA/OAT), found that 134 community-based health information exchange projects across 42 states are developing varying types of organizational and operating models.

To create a more permanent and accountable infrastructure to support health information exchange, there is a need for a common approach to the formation and operation of RHIOs. The government could help define a common set of practices by incorporating minimal performance requirements into its contracts with, or grants to, communities. Another approach, commonly used in health care, is private sector accreditation to ensure that these organizations meet minimal standards. Nongovernmental accreditation would serve a necessary oversight function without undue regulation or requirements. HHS will explore how to ensure minimal standardization in conjunction with other federal agencies and the private sector.

Regardless of how RHIOs are overseen, the government can play an important role in supporting their formation. One role is to ensure that RHIOs are formed in the major

market areas and, to the extent possible, in rural areas. Currently, there are two HHS programs available to support RHIOs through grants and contracts.

First, AHRQ is funding State and Regional Health Information Exchange Demonstration Projects. AHRQ will fund at least five state-level health information exchange projects to build on current state-level planning activities by providing crucial funding, technical assistance, and coordination. Further, the regional health information authorities will be piloted as critical aspects of the projects to build, operate, and sustain health information exchange. AHRQ will announce the states that are awarded contracts in 2004.

The second HHS health information exchange program is through HRSA/OAT, which has a cooperative agreement with the Foundation for eHealth Initiative to administer contracts to support the Connecting Communities for Better Health (CCBH) Program totaling $2.3 million. This program is providing seed funds and support to multi-stakeholder collaboratives within communities (both geographic and non-geographic) to implement RHIOs that can drive improvements in health care quality, safety, and efficiency. The specific communities that will receive the funding through this program will be announced and recognized during the Secretarial Summit on July 21.

Develop a national health information network

Interoperable EHRs and health information exchange requires a set of common standards as well as intercommunication tools such as mobile authentication, Web services architecture, and security technologies. Many of these technologies exist in other industries, but have not been adapted to the unique requirements of health information exchange. A national health information network that can provide low-cost and secure data movement is needed, along with a public-private oversight or management function to ensure adherence to public policy objectives.

Such a technology should be nonproprietary, available for broad use, and shared within the public domain in a manner that is available to all. It should be integrated with public health surveillance and response in accordance with existing statutory provisions, and deployed and operated in a secure, HIPAA-compliant and decentralized manner. This national network will require an investment that is large and risky, and will require the coordinated efforts of many technology companies.

A key component of a national health information network is the development of technically sound and robustly specified interoperability standards and policies for diffusion into practice. There has been considerable effort and progress achieved by HHS and other federal agencies with the adoption of standards across 20 domains by the Consolidated Health Informatics (CHI) initiative to allow for the electronic exchange of clinical health information across the federal government. The National Library of Medicine (NLM), AHRQ, FDA, VA, and DoD have been collaborating to promote the adoption, mapping, and implementation of key vocabularies such as SNOMED CT® and RxNorm (a clinical drug vocabulary). Additionally, the Public Health Information Network (PHIN) and National Electronic Disease Surveillance System (NEDSS) under

the leadership of the CDC have made notable progress in the development of shared data models, data standards, and controlled vocabularies for electronic laboratory results reporting and health information exchange. With HHS support, HL7 has also created a functional model and standards for the EHR.

To begin the process of movement toward a national health information network, HHS is releasing a request for information (RFI) in the summer of 2004 inviting responses describing the requirements for private sector consortia that would form to plan, develop, and operate a health information network. Members of the consortium would agree to participate in the governance structure of this privately financed consortium in an equitable manner. The role that HHS could play in facilitating the work of the consortium and assisting in identifying the services that the consortium would provide will be explored, including the standards to which the health information network would adhere to in order to ensure that public policy goals are executed and that rapid adoption of interoperable EHRs is advanced. The resulting national health information network will be coordinated and interoperable with the FHA.

Also, CMS will be proposing a regulation that will require the first set of widely adopted e-prescribing standards in preparation for the implementation of the new Medicare drug benefit in 2006. When this regulation is final, Medicare Prescription Drug Plan (PDP) sponsors will be required to offer e-prescribing, which will significantly drive adoption across the United States. Health plans and pharmacy benefit managers that are PDP sponsors could work with RHIOs, including physician offices, to implement private industry-certified, interoperable e-prescribing tools and to train and support clinicians.

A subsequent regulation will be proposed for additional standards necessary to realize the full value of e-prescribing, once these standards have been developed and tested in the health care system. In parallel with this effort, FDA will work with the pharmaceutical industry to develop a structured product label that will use medication standards to enable electronic drug information to be available at the point of care when prescribing decisions are made. Through collaboration with the NLM, electronic drug information called DailyMed will be disseminated free of charge to all information systems.

Future possible actions by the federal government include security technology transfer by the DoD. The DoD has significant experience in developing and implementing common and unique infrastructure solutions that provide the foundation for all information exchange. DoD is exploring ways to share this experience with private-sector developers of interoperability solutions to the extent allowable under current law. Potential areas of technology transfer include computing (e.g., computers, databases, and servers) and communication (networks, Internet connectivity, and security firewalls) infrastructure requirements, which serve as the backbone for exchanging secure information.

Coordinate federal health information systems

The federal government maintains a large variety of health information systems that support the delivery, management, reimbursement, monitoring, and other aspects of

patient care. There is a strong need to provide for interoperability and exchange of data through these systems so that federal systems are more efficient and cost-effective. Additionally, federal health information systems will be coordinated and interoperable with the national health information network. There have been early efforts to coordinate these systems through the FHA and the CHI, but there is more to be done. The federal government operates at least three patient care information systems, multiple claims and reimbursement systems, and an undefined number of systems that collect and deliver information for federal agencies, or that store, analyze, or communicate this information elsewhere. To facilitate the exchange of electronic health information, DoD and VA are finalizing a common architecture strategy consisting of standardized data, communications, security, and high-performance health information systems. However, many systems still cannot communicate among themselves or provide a minimal amount of interoperability.

In the near future, a consortium of federal agencies that are involved in health information will make a renewed commitment to the FHA and CHI for the purpose of achieving internal interoperability. This will be accomplished by refining a blueprint and an information architecture for the federal health enterprise. The blueprint will serve as a common business reference point from which information technology investment decisions can be made. The architecture will enable collaboration and data sharing across the government and with various organizations such as states and private entities that provide or need federal information. The FHA initiative is the forum to forge unification of isolated architectures to develop common pathways of interoperability between government agencies. Toward this end, FHA has committees on the EHR, food safety and surveillance, and interagency operability under way. All resulting information architectures will adhere to the industry standards endorsed by the federal agencies as CHI standards.

The VA and DoD are also actively collaborating and cooperating on security standards, consistent with HIPAA security rule and other relevant laws, for the following services: identification, authentication, accountability, data integrity, non-repudiation, confidentiality, and certification. Confidentiality, security of information, and data integrity are fundamental requirements for the successful exchange of information and in the evolution of the EHR.

The VA and DoD Common Security Architecture will contain a framework for information assurance (information security and confidentiality) roles and behavior among information technology assets, and prescribe rules for interaction and interconnection. This architecture must provide for the integrity, confidentiality, and authentication of electronic-protected health information (EPHI) as dictated by HIPAA. It can serve as a basis for federal enterprise-wide health communications exchange. The important work of these departments will be incorporated into the FHA, where both departments are leading members.

Personalize care

The ability to assemble and use information that is complete with respect to a specific person is an essential part of the application of information technology to health care and, in many ways, the fullest expression of interoperability. Consumer-centric information helps individuals manage their own wellness and assists with their personal health care decisions. This information could include consumer-specific health findings, health status monitoring tools, or customized prevention and self-care information. Such personalized care information could be adapted for diverse individual needs, cultural traditions, reading levels, or socioeconomic modulators of illness. The ability to personalize care is a critical component of using health care information in a meaningful manner.

The universe of health information that may be accessed by consumers is enormous. Tools to synthesize and customize this information are crucial for the discovery and presentation of relevant facts in the interest of a given consumer. At present, most of an individual's personal health information is only accessible through a restricted set of channels, primarily his/her physician or health plan. Enhancing the information available to consumers, making it more relevant or customized to their needs and linking this to treatment options, promises to improve the consumer's participation in care delivery. This is particularly true for advances in genetics and genomics that will be key in many respects to personalizing health care. Once equipped with the information about their health and health care choices, consumers will be empowered to co-manage their health and participate actively in decisions about their care.

Consumers are increasingly seeking customized and better information as a means of improving their health status. Increasingly consumers are accessing health information via the Internet, and the number of health-related websites has increased. Consumers are looking for information that is tailored to their illness or concerns, and want to know how advisories, treatment options, risks, or other information relate to themselves. They also want to be able to share and discuss this information with their own health care clinicians.

Three strategies for achieving the goal of personalized care are detailed below:

- Encourage use of (PHRs);
- Enhance informed consumer choice; and
- Promote use of telehealth systems.

Encourage use of PHRs

One rapidly emerging trend is the PHR, which maintains individual personal health information from a variety of health records, guidelines, and other tools useful to consumers. While the specifications for the PHR and its relationship to EHRs have yet to be defined, the Connecting for Health Public Private Collaborative, involving the American Public as Partners work group, has identified techniques, standards, and policies to be employed by developers of PHRs to ensure that information can be exchanged between PHRs and other data sources for the patients' benefit. The group has

also recommended that demonstration projects should occur to implement these common practices.

The federal government has and will continue to use information technology as a central tool and vehicle to disseminate health information and knowledge to consumers. Currently, HHS provides health information via the Web, and agencies customize information and interactive tools for different types of consumers, including the elderly. For example, MedlinePlus, MedlinePlus en Espanol, healthfinder®, CDC's consumer health information, and www.4woman.gov, the Office of Women's Health website, are experimenting with different methods of customizing personal health information. In particular, the CDC's new Futures Initiative includes anticipated changes in the CDC's website that will allow for up-to-date prevention and disease information to be integrated into clinical care information systems to support just-in-time information delivery and reference.

An immediate step in improving consumers' access to personal and customized health information is CMS' Medicare Beneficiary Portal, which provides secure health information via the Internet. This portal will be hosted by a private company under contract with CMS, and will enable authorized Medicare beneficiaries to have access to their information online or by calling 1-800-MEDICARE. Initially the portal will provide access to fee-for-service claims information, which includes claims type, dates of service, and procedures. The pilot test for the portal will be conducted for the residents of Indiana. In the near term, CMS plans to expand the portal to include prevention information in the form of reminders to beneficiaries to schedule their Medicare-covered preventive health care services. CMS also plans to work toward providing additional electronic health information tools to beneficiaries for their use in improving their health.

Enhance informed consumer choice

Unbiased information about the performance of health care providers empowers consumers to make informed choices about where and from whom to receive health care treatments. Consumers should be informed about clinicians and institutions based on what the consumer values, including, but not limited to, the quality of care that the provider has historically delivered. However, efforts to provide reliable and sufficiently risk-adjusted measures about health care provider performance have been significantly shaped and limited by the availability of robust clinical information. Because of this, clinical performance is difficult to compare with certainty, and what is measurable is often not what is important in consumer choice.

CMS has taken a leadership role in promoting consumer choice by providing information about the performance of dialysis facilities, nursing homes, and home health agencies on its consumer-friendly www.medicare.gov website. Since there was no regulation for hospital data reporting, a 10-measure starter set of performance data for heart attack, heart failure, and pneumonia has been voluntarily reported as part of the National Voluntary Hospital Reporting Initiative (NVHRI) since October 2003. The NVHRI is collaborating with the American Hospital Association, the Federation of American

Hospitals, the Association of American Medical Colleges, the AFL-CIO, JCAHO, and others. In February 2005, this information will migrate to Hospital Compare on www.medicare.gov for consumers. Content, displays, and formats are now being tested with consumers in order to make the information consumer friendly and understandable.

Promote use of telehealth systems

The use of telehealth can provide access to health services for consumers and clinicians in rural and underserved areas. Telehealth is the delivery of health care services in cases where the participants are in different locations, and may even be separated in time. Using various forms of telehealth, rural clinicians can, for example, examine a patient's inner ear from a remote location. A patient in a rural emergency room can get the benefit of local care in addition to remote consultation with a specialist. A clinician can review a radiology scan that was forwarded from a remote location. A patient and nurse can interact during a video home visit, and the nurse can check vital signs and monitor medication compliance. A patient and clinician can communicate by e-mail to make health care decisions without requiring the patient to be in the physician's office. These forms of telehealth provide distance-based support to clinicians or to clinicians and patients.

Research studies have demonstrated the usability and cost savings of telehealth applications. Medicare's reimbursement of telemedicine through the physician fee schedule started in January 1999 for several care providers, including physicians, physician assistants, nurse practitioners, clinical nurse specialists, nurse midwives, clinical psychologists, and clinical social workers as well as various types of procedures such as consultations, office visits, individual psychotherapy, and pharmacologic management. Currently, there are certain limitations on the reimbursement requirements, including: a) Only patients located in rural Health Professional Shortage Areas (HPSAs) and beneficiaries in counties not defined as a metropolitan statistical area (MSA) are eligible for telemedicine reimbursement; b) there are fee-sharing challenges between primary care clinicians and specialists; and c) licensed practicing nurses and registered nurses are not eligible for reimbursement under Medicare.

In order to fully use telemedicine as a means of improving care, the Joint Working Group on Telehealth (JWGT) provides a forum for federal agencies to coordinate telehealth program and policy development. The JWGT membership includes representatives from every major cabinet agency involved in providing telehealth services, and is staffed by the Office for the Advancement of Telehealth, HRSA. Agencies and private-sector organizations share telehealth expertise and information, educate participants, and take actions to increase use of telehealth. Additionally, HRSA has been a leader in promoting the advancement of telehealth systems, funding programs and demonstrations since 1988.

Improve population health

The improvement of population health requires timely, accurate, and detailed clinical information to allow for evaluation of health care delivery. It may include reporting of

critical findings to public health officials, clinical trials, and other research. Feedback to clinicians is also important for improvements in care delivery. However, collection of this information cannot impose an undue burden. This is of particular importance as assumptions are made about the ability of EHRs to support a new echelon of information needs for research and surveillance.

Significant work has been done by the CDC and state public health agencies to identify and implement appropriate standards and establish practices that meet a broad array of different population health functions. The benefits of information collection to support population health – quality measurement, patient safety, research and clinical trials, public health reporting, and biosurveillance – are apparent, but how and under what conditions these data should be collected are not. While information required for population health needs to be captured by EHRs and exchanged with local, state, and federal government to the extent possible under current law, this has to proceed in a coherent and collaborative manner.

The following three strategies will achieve the goal of using HIT to improve the population's health status:

- Unify public health surveillance architectures;
- Streamline quality and health status monitoring; and
- Accelerate discovery and dissemination.

Unify public health surveillance architectures

To reduce the risk to public health from hazards such as communicable diseases, unsafe imported foods, and terrorism, public health must detect threats soon after they occur, investigate the magnitude and nature of the threat, track who is sick, with whom they have been in contact, and where they were exposed to the disease or contaminated food. Public health officials must also alert health care providers of a confirmed or potential threat and deliver relevant information, treatment guidelines, and interventions; support countermeasure and response administration, including treatment, prophylaxis, vaccination, and isolation; and monitor the response, determine if it was effective, and apply changes to improve outcomes. Likewise, medical devices and other products need to be monitored by trained professionals who can ensure that the device is functioning properly and the desired functional result is achieved.

An interoperable surveillance system will allow exchange of information, consistent with current law, among provider organizations, organizations they contract with, and state and federal agencies. The key challenge in harmonizing surveillance architectures is to identify solutions that meet the reporting needs required for each surveillance function yet which also work in a single integrated and cost-effective architecture. The current legal framework for public health surveillance will guide short-term planning efforts to integrate architecture. However, as longer-term planning is under way, HHS will explore business practices and certain types of secure information exchange for public health purposes. These findings may require additional regulations to better protect public health.

HHS is exploring many actions to realize the goal of improving population health. The following actions summarize the most important future efforts that could better unify architectures to improve surveillance. The government-sponsored standards-setting processes, CHI and the FHA, will develop a unified and interoperable infrastructure to simplify the surveillance-related data exchange between government agencies and the health care delivery system. This will result in consistent, real-time data feeds routed over common infrastructure to meet the needs of public health surveillance and response functions, and allow for a unified population-health approach that will deliver the best care in the most cost-effective manner. As part of this, CDC will work to integrate local and state public health surveillance, alerting, knowledge management, and response functions using national information systems standards. Public Health Informatics Network (PHIN) partnerships with the Department of Homeland Security have implemented HL7 lab result reporting for environmental monitoring in over 20 Laboratory Response Network Labs nationally. Partnerships with the FDA are developing HL7 standard messages for food monitoring, and the FDA has also developed an HL7-based messaging standard to facilitate automated reporting of product-related adverse events from the EHR to improve the frequency and quality of reporting without inconveniencing the clinician or causing undue burdens on providers. Similarly, the Environmental Protection Agency (EPA) has a mature surveillance system that will contribute substantially to the consolidated architecture.

CDC will also work with local and state public health partners that are involved with regional health information projects to ensure that important public health data is captured and transmitted, as appropriate, to CDC. BioSense, a new program for accelerated early detection of bioterrorist or naturally occurring outbreaks, will work with AHRQ-funded state demonstration programs starting in 2004 to plan for the provision of health event data for use in detecting, localizing, and then investigating emerging disease events. BioSense is now receiving standards-based health event data from DoD and VA health care facilities.

Streamline quality and health status monitoring

Aggregated and de-identified individual health care data have a critical role in monitoring population health status and clinical quality at the point of care. These data can be used to detect and address quality variations, to enable consumer choice, and for many other functions. They can support pay-for-performance programs and other means of rewarding outstanding quality. When aggregated and analyzed, timely and detailed clinical data can improve care in a community or the whole nation by rationalizing the allocation of resources, steering new research, and enhancing clinician training. Many different state and local organizations collect subsets of data for specific purposes and use them in different ways. A streamlined quality-monitoring infrastructure will allow for a complete look at quality and other issues in real-time and at the point of care, while also minimizing intrusions and burdens imposed on clinicians.

Population health status monitoring can also benefit from widespread adoption of EHRs and PHRs. CDC currently receives health status data from many sources, including population-based surveys, vital statistics, and administrative datasets. EHRs and PHRs have the potential to supplement conventional reporting and monitoring through direct electronic data acquisition.

HHS has already shown progress in streamlining quality reporting. CMS has developed, in conjunction with the American Medical Association's Consortium on Performance Improvement, a set of clinical quality measures for physician office-based care, which are now going through an expedited approval process at the National Quality Forum. The measures are designed in such a way as to be collected by an EHR. In addition, the IHS has developed specific software applications to facilitate the electronic tracking of patient, community, and population-based health indicators. This software is linked to Healthy People 2010, as well as other national quality measure sets, and can be used by organizations that qualify for payments in performance-based programs. The software application, as well as the specifications for it, are available to the public for review and re-use.

Accelerate research and dissemination of evidence

To improve human health, scientific discoveries must be translated into clinically useful products and applications. Such discoveries typically begin in the laboratory, where scientists study the mechanisms and pathogenesis of a disease at a molecular or cellular level, and then progress to testing in animal models and eventually people. This bench-to-bedside approach is critical to ensuring a fruitful return on the public's investment in research and in ensuring the safety and efficacy of future clinical therapies. It is important, therefore, that the federal government use information technology to accelerate this process.

Information technology can be a key tool in enhancing the efficiency and effectiveness of the development of therapeutic agents and tools such as drugs, devices, and biologics. Information technology can enhance the process of organizing and conducting trials, including protocol development, human subject protection review, participant recruitment, and site selection. Information technology can also be promoted to optimize the safety of clinical studies, facilitating the timely reporting of safety data, as well as the sharing and analysis of data by the FDA, AHRQ, and the National Institutes of Health (NIH), and other agencies that may have oversight responsibilities.

NIH plans to develop NECTAR, which will link research sites and ultimately create a "national network of networks," in coordination with the national health information network, by which research information and findings will be shared and scientific collaborations facilitated. NECTAR includes a research workflow model, a common lexicon of standard vocabularies to describe medical and scientific events, and analytical and dissemination tools.

FDA and NIH, together with the Clinical Data Interchange Standards Consortium (CDISC) – involving over 40 pharmaceutical companies and clinical research organizations – have developed a standard for representing observations made in clinical trials called the Study Data Tabulation Model (SDTM). This model will facilitate the automation of the largely paper-based clinical research process, which will lead to greater efficiencies in industry and government-sponsored clinical research. The first release of the model and associated implementation guide will be finalized prior to the July 21 Secretarial Summit and represents an important step by government, academia, and industry in working together to accelerate research through the use of standards and HIT.

The National Cancer Institute (NCI) has been piloting the Cancer Biomedical Informatics Grid (caBIG), and plans to implement it across 50 academic research centers supporting cancer research. The informatics infrastructure connects teams of cancer and biomedical researchers to enable them to better develop and share tools and data in an open environment with common standards, creating a network that links individuals and national and international institutions. caBIG is contributing standards-based applications from basic science in genomic and proteomics through those supporting clinical research to provide researchers with state-of-the-art tools to accelerate the discovery and development process.

In another effort to speed new research discoveries to the public, NCI and FDA are also working to facilitate a more cost-efficient flow of higher-quality clinical research data to FDA. As part of the caBIG effort, they will deploy a standards-based, electronic clinical research exchange to support regulatory submissions. This infrastructure will allow secure transmission of clinical research information among sponsors, researchers, and the FDA. This infrastructure is being developed through an open community process involving academia, government, and industry to address the opportunities of this technology to facilitate clinical research and the issues surrounding implementation.

Beyond using information tools to facilitate the research process, interoperable EHRs that can access national clinical decision support databases would also accelerate translation of research into practice through ready access to the latest clinical knowledge. Real-time delivery of clinical information to clinicians at the point of care could improve clinical decisions at the time they are being made. It would also allow for clinical alerts on medication recalls, as some large health plans have been able to do for some time, as well as new therapies and screening opportunities. HHS agencies will work together in implementing the necessary actions to translate the evidence base into practice.

Implementation

This Framework for Strategic Action (Framework) defines the four broad goals that will give rise to consumer-centric and information-rich care. It also specifies the 12 strategies that will be followed to accomplish these goals. The goals and strategies in the Framework outline a general approach to how the President's vision for high-quality and efficient care will be realized. The National Coordinator will work with federal agencies

and the private sector to develop a full strategic plan and also to take actions that build upon current progress toward the vision.

Executive Order 13335 directed the National Coordinator to develop, maintain, and direct the implementation of a strategic plan to guide the nation's implementation of interoperable HIT in both the public and private health care sectors. As directed by the Executive Order, this plan will:

- Advance the development, adoption, and implementation of health care information technology standards nationally through collaboration among public and private interests, and ensure that these standards are consistent with current efforts to set HIT standards for use by the federal government;
- Ensure that key technical, scientific, economic, and other issues affecting the public and private adoption of HIT are addressed;
- Evaluate evidence on the benefits and costs of interoperable HIT and assess to whom these benefits and costs accrue;
- Address privacy and security issues related to interoperable HIT and recommend methods to ensure appropriate authorization, authentication, and encryption of data for transmission over the Internet;
- Not assume or rely upon additional federal resources or spending to accomplish adoption of interoperable HIT; and
- Include measurable outcome goals.

The Framework and related actions will follow three phases of implementation. Phase one will focus on the development of market institutions. Many of the agents and entities that are necessary for the health care industry to realize better value do not exist and must be developed and made operational before widespread change can occur. Certification organizations, group purchasing entities, and low-cost implementation support organizations are examples of market institutions that do not exist at this time, but which are necessary to support clinicians as they procure and use information technology. Likewise, although there are a variety of regional health information organizations, there is no consistent institution that can provide a platform through which financial investment or other support can be channeled to clinicians.

Market institutions will stabilize the market and thereby create a better environment for investment and accountability. They will lower the risk of HIT procurement, thereby enhancing demand and making more efficient use of resources that are invested. They will enhance the depth and confidence of HIT buyers and will accelerate the introduction of quality and efficiency into the mainstream of care delivery. Through these institutions, lasting and positive change in the way care is delivered will be made, and subsequent phases will be readied.

Phase two will involve investment in clinical management tools and capabilities. Once market institutions are in place, substantial investments can be made in the deployment of EHRs, PHRs, telemedicine, health information exchange, and other mechanisms for high-performance care delivery. Along with this, the development of the interoperability tools that are required to exchange health information in a secure and useful manner can

proceed. This infrastructure will result in the capacity for most physician offices, hospitals, and other settings to improve care provided to patients, to share information across settings, to incorporate new knowledge, and to allow unobtrusive monitoring and reporting. This will require large capital investments in technology, business process reengineering, and professional development. These investments will be made less risky and more effective by the experiences and practices of the market institutions deployed in phase one. They will enable the industry to manage according to principles of accountability and to systematically produce the quality and service in health care that is expected by Americans.

Phase three will transition the market to robust quality and performance accountability. In this phase, clinicians will have the tools and capabilities to manage patients and populations, and to deliver consistently high-quality care in an efficient manner. These capabilities will give clinicians the means for constant improvement in practice. Clinicians can then be subjected to stringent quality and clinical performance monitoring, linked to public reporting and reimbursement, without concern about being unable to perform under such scrutiny or expectations. Through performance accountability, the priorities of clinicians can become aligned with society's expectations for care.

Public-Private Leadership

Low adoption and use of HIT are attributable to many factors, including a challenging marketplace and a previous lack of cohesive federal policies supporting it. Leaders across the public and private sector recognize that the adoption and effective use of HIT require a joint effort between federal, state, and local government and the private sector.

The private sector role

While the federal government plays an important role in HIT adoption, the effective use of, and value creation from, this technology lies predominantly with the private sector. The federal government will provide a vision and a strategic direction for a national interoperable health care system, but will rely on a competitive technology industry, privately operated support services, and shared investments in HIT adoption. The private sector must develop the market institutions to deliver the products and services that can transform the paper-based health care system into an electronic, consumer-centered, and quality-based system. The private sector can best ensure that HIT products are successfully implemented in ways that meet the varying needs of American health care across settings, cultures, and geographies. The private sector can also continue constant innovation in HIT and ensure that products are delivered on an affordable basis.

Federal and state governments have delegated most components of quality assurance to voluntary private organizations, including but not limited, to the JCAHO, NCQA, the National Quality Forum, residency review committees, and others. This will be true of quality and performance accountability in the future world of HIT. New market institutions need to be developed that can support clinician adoption of HIT, provide interoperability, and enhance the value realized by these investments. Close

collaboration between public and private sectors can develop new methods for improving care without creating unnecessary regulation and minimizing reporting burdens on private industry.

The federal role

The federal government has substantial cause for addressing HIT adoption. Although the public is only now becoming aware of errors and mistreatments in care delivery, the incidence and severity of errors has been known by researchers for some time. The health status of Americans is lower than it would be if care were seamless, timely, and evidence driven. Health care inefficiency and quality problems create economic burdens on other industries. When working Americans spend large shares of their time moving between physicians, dealing with the morbidity of improperly treated chronic illness, handling care burdens for their elderly parents, and recovering from errors and unnecessary therapies, the productivity of the American labor force, and America's position as a global output leader, is harmed.

The federal government has numerous means of stimulating change in the health care industry, even if most of that change occurs in the private sector. While the federal government should not seek to reform health care without industry collaboration through the use of information technology, neither should it let the status quo exist simply because change will be difficult, complicated, and challenging to the industry. The DoD and VA are major federal health care delivery organizations and, increasingly, contractors for care in communities across the United States. The lessons these organizations have learned about HIT are an invaluable national asset and should be diffused through relationships with private delivery networks. Also, the Federal Employees Health Benefits Program (FEHB) contracts for care in most urban markets across the United States, and can drive positive economic change in general care delivery. Beyond finance and contracting, the current operation of the health care industry results from a vast patchwork of federal regulations that create many unintended inhibitory consequences for quality and efficiency.

Role of the National Coordinator

Executive Order 13335 directed the appointment of the National Coordinator for Health Information Technology to coordinate programs and policies regarding HIT across the federal government. The National Coordinator was charged with directing HIT programs within HHS and coordinating them with those of other relevant Executive Branch agencies. In fulfillment of this, the National Coordinator has taken responsibility for the National Health Information Infrastructure Initiative (NHII), the Federal Health Architecture (FHA), and the Consolidated Health Informatics Initiative (CHI), and is currently assessing other health information technology programs and efforts. In addition, the National Coordinator was charged with coordinating outreach and consultation between the federal government and the private sector. As part of this, the National Coordinator was directed to coordinate with the National Committee on Vital Health Statistics (NCVHS) and other advisory committees.

The National Coordinator will collaborate with DoD, VA, and OPM to encourage the widespread adoption of HIT throughout the health care system. To do this, the National Coordinator will gather and disseminate the lessons learned from both DoD and VA in successfully incorporating HIT into the delivery of health care, and facilitate the development and transfer of knowledge and technology to the private sector. OPM, as the purchaser of health care for the federal government, has a unique role and the ability to encourage the use of EHRs through the Federal Employees Health Benefits Program, and the National Coordinator will assist in gaining the complementary alignment of OPM policies with those of the private sector.

Preliminary discussions indicate that the National Coordinator will fulfill its charge by performing six functions, as detailed below.

Provide leadership

The unified vision and strategic goals established by the President will be achieved by the development of common approaches to HIT. To do this, the National Coordinator will work with agencies to develop strategies and metrics for monitoring progress to ensure that it is consistent with agency mission. As the National Coordinator works with programs and policies across the government, gaps will be identified, along with solutions to fill these gaps. The National Coordinator will ensure that the federal government plays a key role in leveraging federal resources to encourage the private sector to develop a strong health information infrastructure that will serve to improve health care delivery and public health functions.

Promote collaboration

Better collaboration would benefit HIT programs across the federal government. Sharing information and expertise will facilitate the development and implementation of HIT programs and allow agencies and stakeholders to benefit from lessons learned by others. To improve the strength and coherence of programs across federal departments and agencies, the National Coordinator will develop the mechanisms to reduce redundancy, to fill programmatic voids, to align programs with available resources, and to maximize the value of the programs to the end goals of health care delivery.

Develop policy

The National Coordinator, working through various agencies, will develop the many new policies needed to implement the strategic plan. It will bring together various work groups that will allow for an interdisciplinary approach to policy development. Coordinated policies will be based on common principles and objectives across agencies. The National Coordinator will also integrate private stakeholder perspectives in the policy development process through close collaboration with the private sector.

Support financial management

The National Coordinator will coordinate investments in HIT by maintaining a strategic plan that can be used as a guide and reference for prioritization in the budget process. The National Coordinator will work with agencies and departments to ensure that budget requests for HIT are coordinated so that federal investments are unified, cost-effective, and aligned with overall federal strategy.

Enhance communication and outreach

Ongoing communication between public and private decision makers will be critical to success of the strategic plan. The National Coordinator will work with federal agencies to transfer useful knowledge to the private sector where appropriate, and will ensure that public and private HIT efforts share information to the degree possible. Also, the National Coordinator will work with NCVHS and other federal advisory bodies to ensure that private sector input is systematically incorporated into policies and programs, where applicable.

Evaluate effectiveness

The National Coordinator will work with agencies to assess the effectiveness of HIT policies and programs. To do this, the National Coordinator will work with federal agencies to develop metrics that can assess progress toward strategic goals over time and across programs. Also, the National Coordinator will identify model business processes that can support collaboration and harmonization of federal HIT programs. The National Coordinator will also work with federal agencies to compare ongoing HIT programs to reference architectures, business requirements, and data standards so that variations and gaps can be assessed and addressed as possible within agency mission.

Conclusion

Health information technology provides a mechanism for refocusing care delivery around consumers without substantial regulation and industry upheaval. Information technology can result in better care (care that is higher in quality, safer, and more consumer responsive) and at the same time, more efficient (care that is appropriate, available, and less wasteful). There are very few other alternatives that can achieve both of these goals in a balanced and timely manner.

A national strategy for HIT is needed to achieve this change. This strategy should inform clinical care by introducing EHRs on a widespread basis everywhere clinicians provide treatment. It should interconnect clinicians to allow them to share data in a seamless and secure manner that protects patient privacy. It should customize health information and care so that consumers can have more control, more treatment options, and more choice of providers, including clinicians who may be at a distance. It also should improve population health by monitoring health care delivery in a simple and timely fashion so that quality, public health risks, and clinical research can be enhanced.

The changes that will accompany the application of information technology to health care will be difficult and will challenge fundamental assumptions that have been long held. However, this change is inevitable, needed, and beneficial. Actions can and should be taken to ensure that this change happens sooner rather than later, is more widespread rather than less, and also improves health care quality while addressing health care costs. The actions that are taken over the next decade will ensure that the best health care can be delivered to Americans, and that lasting and positive change in the health care industry will result.

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Glossary of Selected Terms

Computerized Provider Order Entry (CPOE) – A computer application that allows a physician's orders for diagnostic and treatment services (such as medications, laboratory, and other tests) to be entered electronically instead of being recorded on order sheets or prescription pads. The computer compares the order against standards for dosing, checks for allergies or interactions with other medications, and warns the physician about potential problems.

Consolidated Health Informatics (CHI) Initiative – One of the 24 Presidential eGovernment initiatives with the goal of adopting vocabulary and messaging standards to facilitate communication of clinical information across the federal health enterprise. CHI now falls under FHA.

Decision-Support System (DSS) - Computer tools or applications to assist physicians in clinical decisions by providing evidence-based knowledge in the context of patient-specific data. Examples include drug interaction alerts at the time medication is prescribed and reminders for specific guideline-based interventions during the care of patients with chronic disease. Information should be presented in a patient-centric view of individual care and also in a population or aggregate view to support population management and quality improvement.

Electronic Health Record (EHR) – A real-time patient health record with access to evidence-based decision support tools that can be used to aid clinicians in decision-making. The EHR can automate and streamline a clinician's workflow, ensuring that all clinical information is communicated. It can also prevent delays in response that result in gaps in care. The EHR can also support the collection of data for uses other than clinical care, such as billing, quality management, outcome reporting, and public health disease surveillance and reporting.

Electronic Prescribing (eRx) – A type of computer technology whereby physicians use handheld or personal computer devices to review drug and formulary coverage and to transmit prescriptions to a printer or to a local pharmacy. E-prescribing software can be integrated into existing clinical information systems to allow physician access to patient-specific information to screen for drug interactions and allergies.

Enterprise Architecture – A strategic resource that aligns business and technology, leverages shared assets, builds internal and external partnerships, and optimizes the value of information technology services.

Federal Health Architecture (FHA) – A collaborative body composed of several federal departments and agencies, including the Department of Health and Human Services (HHS), the Department of Homeland Security (DHS), the Department of Veterans Affairs (VA), the Environmental Protection Agency (EPA), the United States Department of Agriculture (USDA), the Department of Defense (DoD), and the

Department of Energy (DOE). FHA provides a framework for linking health business processes to technology solutions and standards, and for demonstrating how these solutions achieve improved health performance outcomes.

Health Information Technology (HIT) – The application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making.

Personal Health Record (PHR) – An electronic application through which individuals can maintain and manage their health information (and that of others for whom they are authorized) in a private, secure, and confidential environment.

ATTACHMENT 1:

Report from the Office of Personnel Management

Interoperable Health Information Technology

Report to the President

United States Office of Personnel Management
Kay Coles James, Director
July 2004

UNITED STATES
OFFICE OF PERSONNEL MANAGEMENT
WASHINGTON, DC 20415-1000

OFFICE OF THE DIRECTOR

Dear Mr. President:

On April 27, 2004, you issued Executive Order 13335, Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator. This order establishes the importance you place on the development and implementation of a nationwide interoperable health information technology (HIT) infrastructure to improve the quality and efficiency of health care.

The Executive Order embodies your vision to develop a nationwide interoperable health information technology infrastructure that:

a) Ensures appropriate information to guide medical decisions is available at the time and place of care;
b) Improves health care quality, reduces medical errors, and advances the delivery of appropriate, evidence-based medical care;
c) Reduces health care costs resulting from inefficiency, medical errors, inappropriate care, and incomplete information;
d) Promotes a more effective marketplace, greater competition, and increased choice through the wider availability of accurate information on health care costs, quality, and outcomes;
e) Improves the coordination of care and information among hospitals, laboratories, physician offices, and other ambulatory care providers through an effective infrastructure for the secure and authorized exchange of health care information; and,
f) Ensures that patients' individually identifiable health information is secure and protected.

In order to help fulfill your vision, you directed me to submit a report within 90 days of your order on options to provide incentives in the Federal Employees Health Benefits (FEHB) Program to promote the adoption of interoperable health information technology. I am pleased to submit this report to support this important undertaking.

Sincerely,

Kay Coles James
Director

Interoperable Health Information Technology

A Report for:

The Honorable George W. Bush
President
United States of America

on

Federal Employees Health Benefits Program Initiatives to Promote the Use of Health Information Technology

by

Kay Coles James
Director
U.S Office of Personnel Management

INTRODUCTION

OVERVIEW

The Federal Employees Health Benefits (FEHB) Program began in 1960. It is the largest employer-sponsored group health insurance program in the world, covering more than 8 million Federal employees, retirees, former employees, family members, and former spouses.

Public Law 86-382, enacted September 28, 1959, created the FEHB Program. The law governing the Program is chapter 89 of title 5, United States Code. The law authorized the Civil Service Commission (now the Office of Personnel Management OPM) to write regulations necessary to carry out the Act. These regulations are in part 890 of title 5 and chapter 16 of title 48, Code of Federal Regulations.

Over 200 health plan choices currently are offered under the FEHB Program. There are twelve fee-for-service plans, of which seven are open to all enrollees, while the rest are available only to specific categories of employees. In addition, health maintenance organizations (managed care plans) are available in many specific local areas throughout the United States. Premiums and benefits are negotiated annually. Premiums and benefits vary among the plan offerings allowing Federal employees and retirees a wide choice to suit their individual circumstances.

This consumer-based choice is a key hallmark of the FEHB Program. The Government pays on average about 72% of the cost of the health benefits coverage, and enrollees pay the remainder, based on a formula set by law.

The FEHB law provides OPM wide authority to contract with various private health insurance plans. Annual contract negotiations are a bilateral process, and both OPM and the plan must agree on the final terms. Individual policies or contracts are not issued to FEHB Program enrollees. Each enrollee is given a detailed description of benefits so the consumer may use the open enrollment period to choose the best protection for his or her circumstances.

NEGOTIATIONS

The negotiation process in the FEHB Program formally begins in the spring of each year. OPM sends all current and newly approved qualified health plans the annual Call Letter to advise them on goals and procedures for negotiation of contracts that will be effective the following January. In conjunction with the Call Letter, OPM issues instructions for premium rate negotiation for the upcoming contract year. There are two rating types, experience rating and community rating. All proposals are due by May 31.

The Office of the Inspector General audits health plans to make sure our costs are appropriate.

PREMIUM RATE NEGOTIATIONS

Experience Rating

Experience rating bases the FEHB Program premiums on its benefit costs and administrative expenses. OPM's actuaries also evaluate each plan's rate proposal in relation to past premiums and anticipated future premium requirements to ensure the plan's premiums will be reasonably stable, represent good value for the benefits provided, and remain competitive with other FEHB plans. Fee-for-service plans and some HMOs are experience rated. The goal of the experience-rate negotiation is to make sure premiums are set high enough to support the plan's expenses but low enough to be competitive. Rate negotiations reflect a dynamic between premiums and costs and covered expenses. OPM rate instructions for experience rated plans are detailed and feature protection for the Government, enrollees, and plans. Funds in excess of a plan's current needs are held in the Employees Health Benefits Fund in the U.S. Treasury. The reserves provide a protective cushion against unanticipated costs and help achieve rate stability.

Each year specific profit margins are negotiated. This is the only profit allowed for experience rated plans. If at the end of a contract period there are excess funds over expenses, the excesses are credited to the reserve, not kept by the plan.

Community Rating

The majority of FEHB plans are health maintenance organizations (HMOs) and use community rating. This rate-setting methodology is based on what the plan charges its other groups. OPM analyzes and reviews each plan's rate to ensure the FEHB rates are fair. Our community rates are based on the best rates the plan offers its two subscriber groups most similar to the FEHB group. Preferential rates granted to a group similar to the FEHB group must be granted to the Government.

Like experience-rated plans, the FEHB maintains reserves to mitigate rate instability, rate increases, and benefit changes.

SUPPORT FOR INTEROPERABLE HEALTH INFORMATION IS GROWING

Below are brief summaries of typical initiatives related to interoperable health information technology that are currently emerging.

WellPoint, a Blue Cross and Blue Shield local plan, recently began a program called Prescription Improvement Package. The program offers physicians, at no charge, a wireless, handheld electronic prescribing unit, a wireless access point, and a one-year subscription to an e-prescribing service. Initially, WellPoint will target 2,000 physicians who can support the technology. The WellPoint effort is aimed at reducing medication errors and saving costs by decreasing duplication of services. This allows physicians to discard their prescription pads in favor of electronic transmissions to any pharmacy. WellPoint, with Microsoft's Healthcare and Life Sciences Group acting as technology consultant, provides Microsoft e-prescribing software to the 19,000 physicians in WellPoint's network in California, Georgia, Missouri, and Wisconsin.

Empire Blue Cross and Blue Shield is in the last stages of a program that awards bonus payments to hospitals that meet certain Leapfrog standards. Payments are paid by participating employers and equal a percentage of the hospital claims for employees of the participating employers. The self-funded employers are IBM, Verizon Communications, PepsiCo, and the Xerox Corporation. The goal of this program is to reduce errors and improve health care quality through the increased use of Computer Physician Order Entry (CPOE) and other Leapfrog Group standards; reward technical

innovation; and raise the standards for all hospitals in health information technology HIT adoption and health outcomes. A formal evaluation to assess the impact on improvements in quality of care and error avoidance is planned when the program concludes.

Blue Cross & Blue Shield of Massachusetts will start paying primary care physicians at Beth Israel Deaconess Medical Center, Caritas Christi Health Care, and Baystate Health System for "Web visits" with their patients beginning August, 2004. Harvard Vanguard Medical Associates, the large Eastern Massachusetts doctors' group, and the insurer Harvard Pilgrim Health Care, also are experimenting with doctor-patient e-mail programs. At Beth Israel Deaconess, patients can enroll in "PatientSite," an online system that allows them to schedule appointments, look up test results, and e-mail their doctors. Blue Cross only is paying doctors who use a standardized Web visit form developed to provide secure online communication.

Anthem Blue Cross and Blue Shield provides a member Website that provides members with an individually tailored online experience that offers quicker, easier, and more efficient access to self-service tools and member-specific health information.

Members use the Website for four reasons: to view their membership information, to choose or change health care providers, to learn about health and wellness, and to shop for health-related products and services at discounted prices. Members log in and then

have one-click access to MyServices, MyProviders, MyHealth, and MySpecialOffers – all efficiently organized by tabs and links - for easy navigation.

MyAnthem offers members the opportunity to become more involved in their health care through online capabilities that allow greater clarity, simplicity, and management over their health care benefits. MyAnthem provides an easy way to help members gain more control over their health care benefits through secure access that's available at any time and from any place. The new Website satisfies many member needs in that it offers a personalized experience, customized content, simplified user interface and improved communication, and enhanced relationships that can translate into more information and tools at the member level allowing the member to make informed decisions about his or her health care.

Integrated Healthcare Association (IHA) has convened six large California health plans in a pay-for-performance program. The health plans award bonuses to physician groups based on an aggregate score that includes clinical measures, patient satisfaction, and IT investment. While each health plan sets its own dollar award, IHA suggests a bonus amount of 5-10% of the per-member capitation payment. The IT portion of the bonus is based on the physician groups' ability to match multiple clinical data sets at the patient level and to deliver electronic data at the point of care (electronic health records, electronic lab results, patient registries, etc.).

Bridges to Excellence (BTE), a Robert Wood Johnson-sponsored initiative, is focused on creating system-wide improvements in care delivery by linking physician payment and performance. This initiative, which includes a consortium of quality partners, health plans, and providers has two current projects underway – Physician Office Link (POL) and Diabetes Care Link (DCL). POL stresses the necessity and value of an HIT infrastructure in a physician's office to promote error reduction and quality improvements. Rewards are based on a physician's use of clinical information systems and evidence-based medicine; patient education and support; and care management. The intent is to establish a HIT infrastructure and link it to improvements in the providing of more efficient and higher quality care. The DCL's intent is to test the effectiveness and impact of the HIT infrastructure by using HEDIS measures for patients undergoing treatment of diabetes. These proven measures will help the program assess the success of the POL.

MVP and Taconic IPA (TIPA) have developed a partnership, MedAllies, to provide technical assistance, IT support, and other related services. The objective is to develop a community-oriented model through progressive improvements in the continuity of care and connectivity across all providers in the TIPA. Through a phased implementation of an electronic health record EHR, the ultimate goal is to have a highly integrated community data exchange to include physicians, labs, and hospitals. There is no planned, formal, quantitative evaluation, with success being measured by the level of participation. Participation is high and growing to include local community hospitals. MedAllies has

discontinued payment for most of the technology upgrades in physician offices because TIPA and MVP expect financial incentive bonuses to offset the costs for hardware/software upgrades.

Health and Human Services, Centers for Medicare and Medicaid Services (CMS), is in the process of implementing a three-year demonstration project, the Doctor Office Quality-Information Technology (DOQ-IT) project. Medicare Advantage plans will be providing financial incentives to physician offices to adopt HIT and meet certain performance measures. Physicians must treat a certain number of Medicare beneficiaries and meet specific systems and process requirements that include adoption of IT and care management. The physicians also must agree to phase in, over the three-year timeframe, the use of HIT to manage clinical care and electronic reporting of clinical quality and outcomes measures data. Several goals of this project are to adopt HIT in small- to medium-sized physician offices to promote continuity of care and stabilization of medical conditions, and to reduce adverse health outcomes of those beneficiaries with chronic illnesses.

CMS currently is conducting a Medicare demonstration project that uses financial incentives to encourage hospitals to provide high quality inpatient care. Hospitals that deliver the best quality of care will be rewarded with higher Medicare payments. Bonuses will be awarded based on a hospital's performance on evidence-based quality measures for a variety of medical conditions. Only top performing hospitals will receive

monetary bonuses. While there is not a specific HIT component, information on each hospital's performance will be made available to health care providers and consumers that will contribute to a wider availability of information and informed choice.

WHAT OPM IS DOING NOW

OPM recognizes that in order to achieve shared goals and broaden the health care spectrum, there must be a collaborative effort from all organizations involved in the process. As the largest purchaser of employee health care benefits, OPM has undertaken and affiliated itself with a variety of organizations working toward common goals such as quality and affordable health care, positive medical outcomes, reduction of medical errors, wider availability of health information, and the creation of a competitive marketplace that provides choice to the consumer.

OPM'S COLLABORATIVE EFFORTS TO SUPPORT HIT

National Quality Forum (NQF)

NQF is a membership organization that is developing and implementing a national strategy for health care quality measurement and reporting. OPM currently serves as the Quality Interagency Coordination Task Force (QuIC) representative to NQF's Board of Directors.

Quality Interagency Coordination Task Force (QuIC)

The QuIC is an interagency task force charged with ensuring all Federal agencies involved in purchasing, providing, studying, or regulating health care services are coordinating their work on improving health care quality. OPM chairs the Patient and

Consumer Information Workgroup, one of five workgroups carrying out the QuIC's mission.

Leapfrog Group (LFG)

Sponsored by the Business Roundtable, the LFG's goal is to mobilize employer purchasing power to initiate breakthrough improvements in the safety and overall value of health care to American consumers. OPM participates as an LFG liaison member of the Board.

National Committee on Quality Assurance (NCQA)

NCQA's mission is to improve the quality of health care delivered to people everywhere. NCQA is active in quality oversight and improvement initiatives at all levels of the health care system. NCQA is best known for its activity of assessing and reporting on the quality of the nation's managed care plans through its accreditation and performance measures program. NCQA currently is supporting HIT by its new standards that support the Bridges to Excellence. OPM has a long standing association with NCQA.

National Business Group on Health

Formerly the Washington Business Group on Health, representing over 200 large employers, health care companies, benefits' consultants, and vendors, it is the nation's only nonprofit organization devoted exclusively to finding innovative and forward-thinking solutions to the nation's most important health care and related benefits issues.

Joint Commission Business Advisory Group

Created by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), the Business Advisory Group provides counsel on employer priorities in the evaluation of health care quality and assists the Joint Commission in identifying quality and safety issues important to employers. OPM is a member of the Board. The group meets several times each year and includes a cross section of individuals and coalitions representing businesses of varying sizes and different types of purchasing arrangements across the country. The Joint Commission relies on a variety of advisory groups in its continuous effort to improve the safety and quality of care provided to the public. These groups provide feedback to help JCAHO develop and revise standards, policies, and procedures that support performance improvement in health care organizations.

Center for Health Transformation

OPM has become actively engaged with the Center for Health Transformation through discussion and attendance at conferences sponsored by the Center. The Center for Health Transformation's vision is to accelerate the transformation of health and health care into a dynamic 21st century intelligent health system that results in better health, more choices, and lower costs to all. We share the Center's idea that the key drivers to health transformation are:

- patient safety and patient outcomes;

- information and communication technology;
- a system and culture of quality; and,
- individual knowledge, responsibility and power to choose.

eHealth Initiative

OPM has just been invited to join the Employer and Purchaser Advisory Board of the eHealth Initiative. The eHealth Initiative is moving forward aggressively to create national and local collaborative efforts with employers to support a common goal of higher quality, safer and more efficient healthcare enabled by information technology. The eHealth Initiative supports the improvement of measurement ability, data integrity, and efficiency of collection and transmission of data.

The Employer and Purchaser Advisory Board of the eHealth Initiative and its Foundation is a vehicle for high-level discussions of issues important to the employer community and members of the eHealth Initiative. The group was formed to support the further development of the eHealth Initiative's strategy and the successful execution of its mission, which is to improve the quality, safety and efficiency of healthcare through information and information technology.

Below are summaries of OPM's initiatives already underway that can help leverage its purchasing power to support HIT.

Pharmacy Benefit Management Arrangements

Many FEHB plans have had contractual arrangements with pharmacy benefit managers (PBMs). Prescription drug costs represent a high percentage of total FEHB costs. PBMs provide real time online access to member enrollment records to facilitate point-of-sale transactions. This technology can be leveraged to promote patient safety and connectivity. The interconnectivity that PBMs have with retail pharmacies can serve a vital role to link providers and pharmacies.

Care Management

FEHB plans generally provide care management services for members with chronic conditions, including flexible benefit options and diagnosis-based programs. Care management programs help educate affected members about their chronic conditions and help ensure they are getting appropriate services. It is generally accepted that a relatively small percentage of members, primarily those with chronic conditions, use the greatest percentage of benefits. By addressing the needs of this chronically ill population, health plans help improve the quality of care and promote the effective use of benefit dollars. Online decision support tools available to members help facilitate their access to information and educational materials.

Further, OPM has asked plans to begin the process of establishing a link between their care management programs and Long Term Care Partners, the administrators of the Federal Long Term Care Insurance Program (FLTCIP), so enrollees with FLTCIP coverage can experience a smooth transition to long term care when necessary.

HealthierFeds

OPM's *HealthierFeds* campaign places emphasis on educating Federal employees and retirees on healthy living and best-treatment strategies to reduce demand on the health care system. This OPM initiative is featured at www.healthierfeds.gov on OPM's Web site. It supports the President's *HealthierUS* initiative which follows a simple formula: *every little bit of effort counts*. The Administration's initiative has identified four keys for a healthier America: be physically active every day, follow a nutritious diet, get preventive screenings, and make healthy choices. OPM has reinforced with FEHB plans that educating their members may lead to more patient involvement in health care decision making and, subsequently, more consumer responsibility.

Quality Initiatives

Quality is a very important aspect of managing health care programs. Quality is how well health plans keep their members healthy, or treat them when they are sick. Good quality doesn't always mean receiving more care. Good quality health care means doing the right thing at the right time, in the right way, for the right person, to achieve the best possible results.

OPM is continuing to provide FEHB members with resources that will help them choose high-quality health plans. OPM provides FEHB members with the accreditation status of participating health plans in our annual *Guide to FEHB Plans*. Accreditation demonstrates an organization's commitment to providing quality, cost-effective health care. Providing FEHB members with accreditation information allows consumers to choose a high quality health plan.

OPM also provides Federal employees and retirees with individual health plan ratings based on the results of our annual Consumers' Assessment of Health Plans Survey. This consumer survey allows current plan members to rate their health plans and providers in several key areas, including overall satisfaction, satisfaction with their providers, access to care, customer service, and claims processing. Providing FEHB members with this consumer survey information allows them to consider the feedback of other consumers when choosing a health plan.

E-Initiatives

OPM is continuing to expand the use of the Internet as a valuable communications and resource tool. During the annual open season events, OPM provides in various ways, comprehensive program information, including health plan brochures, FEHB guides, premiums and other useful information our customers need to choose a quality health plan. The FEHB Website, linked from the OPM website, www.opm.gov, links to a report

card designed by the National Committee for Quality Assurance (NCQA). This report card helps users learn more about the quality of care and service provided by HMOs. FEHB consumers also have access to an OPM health plan comparison tool. Most plan consumer information can be linked through OPM's portal.

Patient Safety

During the past few years, the health care community has stressed the importance of a culture of patient safety. We are continuing our work with FEHB plans adding information on their patient safety initiatives and programs to the FEHB Website.

Health Insurance Portability and Accountability Act of 1996 (HIPAA)

The Health Insurance Portability and Accountability Act of 1996 (HIPAA), subtitle, Administrative Simplification, requires the Secretary of Health and Human Services (HHS) to adopt standards for: ten electronic administrative and financial health care transactions; unique identifiers for individuals, employers, health plans, and health care providers; protecting the privacy of individually identifiable health information; and providing security for individually identifiable health information and electronic signatures. HHS has now published several final HIPAA regulations. The compliance deadline for electronic transactions was October 2003. OPM successfully migrated from its proprietary enrollment transaction format to the HIPAA standard format. The final HIPAA privacy regulations were effective April 2003. The security regulations will become effective April 2005 for most plans and April 2006 for small plans. The

national provider identifier regulations will become effective May 2007 for most plans and May 2008 for small plans. All OPM contracts require HIPAA compliance. OPM is working closely with FEHB plans to ensure a smooth transition in meeting these important requirements.

PROVISIONS AVAILABLE TO OPM TO PROVIDE INCENTIVES

OPM purchases health benefits coverage for over 8 million employees, annuitants, and dependents. OPM's significant purchasing power is powerful leverage to contract for a comprehensive set of health benefits at affordable prices. Through this leverage, OPM continues to capitalize on the great efficiencies and economies that can be achieved. OPM fully supports initiatives to further an effective and competitive marketplace as it explores ways to adopt HIT in the FEHB Program that will bring knowledge-based tools to the hands that deliver health care.

The end result of any such program is to raise the bar so that everyone is performing at a higher level. It should be a program that fosters an environment of winners, not winners and losers. In this era of budget consciousness, investment and return on investment are pivotal to purchasers and providers. Therefore, to use purchasing leverage to gain a meaningful and lasting move toward the adoption and full implementation of HIT, OPM needs to move forward in a way that is shared by all stakeholder groups. Incentives

should be properly aligned and meaningful to ensure that both costs and returns are shared by all.

As OPM exerts its purchasing power, it will support the adoption of common standards of performance, outcome, and incentives. The use of accepted standards developed by recognized quality and accreditation organizations lends itself to greater leverage and earlier adoption. OPM will leverage its purchasing power to move forward, not to reinvent the wheel.

OPM's goals in the marketplace will be to:

- Reduce health care costs by increasing efficiency and reducing medical errors, inappropriate care and incomplete care;
- Improve health care quality;
- Ensure appropriate information is available to guide medical decisions at the time and place of care;
- Improve care coordination; and
- Partner with ONCHIT and collaborate with Federal partners and other public and private stakeholders.

Incentives may be provided several ways in the FEHB Program. OPM can explore regulatory changes to help encourage profit incentives for plans to foster HIT adoption and implementation. Experience-rated plans can be rewarded for progress toward

adopting or adapting incentives for HIT. Using plans' profit motive should help OPM leverage its market position to help HIT adoption.

Community rated plans incorporate both their administrative expenses and any profit amount into their rates. Community rated plans are subject to performance goals and incentives. OPM can explore regulatory changes to align current plan performance elements to include HIT adoption.

OPTIONS

OPM will explore adoption of a variety of options, such as those below, to speed the nationwide phase-in adoption of HIT as soon as practicable.

1) Strongly encourage FEHB Program participating health plans to adopt systems that are based on the Federal Health Architecture standards.

2) Strongly encourage health plans to highlight their provider directories to indicate individual provider HIT capabilities.

3) Strongly encourage health plans to link disease management and quality initiatives to HIT systems for measurable improvements.

4) Strongly encourage health plans to provide incentives for the adoption of interoperable health information technology systems by key providers under FEHB contracts.

5) Base part of the service charge, or profit, for fee-for-service and other experience-rated plans on their developing incentives for:

   - Doctors and pharmacies to use paperless systems to fill prescriptions (*e*Prescribing);
   - Contracting with hospitals that use electronic registries, electronic records, and/or *e*Prescribing; and
   - Increasing the number of enrollees whose providers use electronic registries, electronic records, and/or *e*Prescribing.

6) Introduce performance goals for HMOs (community rated plans) that are linked to their developing incentives for:

   - Doctors and pharmacies to use paperless systems to fill prescriptions (*e*Prescribing);
   - Contracting with hospitals that use electronic registries, electronic records and/or *e*Prescribing;
   - Increasing the number of enrollees whose providers use electronic registries, electronic records and/or *e*Prescribing.

7) Introduce incentives and performance goals for plans that contract with networks of providers to make records accessible through secure and HIPAA compliant interoperable HIT systems.

8) Introduce incentives and performance goals for plans that integrate their provider networks with local and national health information infrastructure initiatives.

9) Encourage and reward pharmacy benefit managers for providing incentives for *e*Prescribing and health information technology linkage.

OPM has great respect for the power and creativity of the private sector to determine solutions. We will continue to collaborate with our private sector partners as well as our public sector partners to achieve the goals set by President George W. Bush in his Executive Order. We believe these goals can be achieved without violating the key principle that desired outcomes can be achieved through negotiation rather than imposed through mandates.

United States Office of Personnel Management
1900 E Street, NW
Washington, DC 20415

ATTACHMENT 2:

Report from the Veterans Administration

THE SECRETARY OF VETERANS AFFAIRS
WASHINGTON

July 15, 2004

The Honorable Tommy G. Thompson
Secretary of Health and Human Services
200 Independence Avenue, SW
Washington, DC 20201

Dear Secretary Thompson:

I am enclosing a *Report on Approaches to Make Health Information Systems Available and Affordable to Rural and Medically Underserved Communities.* This submission is made on behalf of the Department of Veterans Affairs (VA) pursuant to President Bush's April 27, 2002 Executive Order, *Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator.* The report fully meets the requirement for VA, and has been coordinated with the Department of Defense (DoD). You will receive DoD's report under separate cover.

The recommendations, focus on the capture of lessons-learned and technology and knowledge transfers from VA/DoD data exchange initiatives, the adoption of common standards and terminologies to facilitate effective and more rapid development of technologies, and the use and transfer of telehealth technologies to support care to rural and remote locations.

The report also includes discussion and recommendations of VA technologies that should be considered for transfer options in support of the President's goal of furthering the use of health information technologies.

I have also enclosed the VA specific paragraphs that have been proposed for inclusion in the Office of the National Health Information Technology Coordinator Strategic Framework document.

If you have any questions, please have a member of your staff contact Robert M. Kolodner, M.D., Acting Chief Health Informatics Officer, at (202) 273-8663.

Sincerely yours,

Anthony J. Principi

Anthony J. Principi

Enclosures

Department of Veterans Affairs
Report On
Approaches to Make Health Information Systems Available and Affordable to Rural and Medically Underserved Communities

In cooperation with the
Department of Defense

Executive Summary

By Executive Order, the President directed that the Secretaries of the Departments of Veterans Affairs (VA) and Defense (DoD) develop a joint approach to work with the private sector to make their health information systems available as an affordable option for providers in rural and medically underserved communities. This report is submitted on behalf of VA through the Secretary of the Department of Health and Human Services (HHS). It provides coordinated VA/DoD recommended approaches that focus on the capture of lessons-learned and technology and knowledge transfers from data exchange initiatives, the adoption of common standards and terminologies, and the development of telehealth technologies.

In cooperation with HHS, and as also mandated by the President's Executive Order, VA is contributing to the development of a national Strategic Plan that will address a coordinated strategy to improve the delivery of health care by evaluating and recommending technologies that are available across the Federal government. The task to compile the technology listing is delegated to the Office of the National Coordinator for Health Information Technology (ONCHIT) and recommendations from this report will feed into the larger Strategic Plan.

The report summarizes the comprehensive and close collaboration that VA and DoD have forged to develop interoperable health technologies to improve the quality of care for separate and shared beneficiaries, and to better utilize government resources. As a result of this history, the Departments are able to make a number of recommendations that are identified as a result of coordinated approaches related to data exchange, standards, and telehealth. These approaches include private sector partnering or influence and would facilitate the provision of technology to rural and medically underserved populations; therefore, all should be given consideration for inclusion into the overall Strategic Plan. The joint recommendations include:

- Capture lessons learned, including technical and resource identification, of data sharing initiatives. Where appropriate, conduct technology transfers to private sector and state and local levels as a means of providing affordable technologies to these areas.
- Continue joint standards adoption work to leverage the immense capability to influence the vendor community in the development of affordable health technologies.
- Continue utilization and development of telehealth technologies to be used in the direct provision of care to geographically remote areas and areas that are underserved by health delivery services.
- Continue development of personal health record technologies that will support the transformation of health care into a patient centric and patient participatory process.

In addition to joint work conducted with DoD, VA brings immense experience and capabilities to this effort to leverage Federal health information technologies for the benefit of the rural and medically underserved. VA is a world-class leader in the use of electronic health record technology in the care provided to its patients. As an overall health information technology strategy, VA has focused on the development of electronic and personal health record technologies, the adoption and implementation of standards into technologies, participation in broad-data exchange initiatives with community-based and private care partners, as well as the development of interoperable health records.

Much of VA's Veterans Information Systems & Technology Architecture) (VistA) system was developed by VA government resources and, therefore, the software exists in the public domain. Through on-going and active collaborations with a number of government and private-sector resources, VA encourages the proliferation of public domain technologies based on VistA code. This approach reduces expensive development costs associated with software and human capital requirements and makes proven electronic health record (EHR) technology an affordable and direct-transfer option to rural and medically underserved communities. VA's approach directly supports the provision of health information technology expertise to communities where it is needed most, at very little cost.

VA's successes with technologies such as VistA, Health**e**People-VistA, the Computerized Patient Record System (CPRS), the Bar Code Medication Administration System, telehealth and VistA Imaging technologies, and the My Health**e**Vet personal health record, are ripe for adoption into a national strategic plan to leverage Federal technologies to improve health care for all citizens. As a leading provider of Federal health care, and an active participant and partner with multiple national and private sector health information technology initiatives, VA is well-prepared to implement each recommendation contained in this report.

I. INTRODUCTION

On April 27, President Bush issued the Executive Order *Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator.* The purpose of the Order was for "the development of an interoperable health information technology infrastructure to improve the quality and efficiency of healthcare." The Executive Order is consistent with the goal expressed by President Bush to ensure that the medical records of a majority of Americans are available in electronic format within 10 years.

As part of this Order in Section 4(b), the President directed the Secretaries of the Departments of Veterans Affairs (VA) and Defense (DoD) to report on the following:

> *The approaches the Departments could take to work more actively with the private sector to make their health information systems available as an affordable option for providers in rural and medically underserved communities.*

The Order requires the Departments to document their approach in reports within 90 days, by July 27, 2004, and to submit the reports to the President through the Secretary of Health and Human Services (HHS). On behalf of the Secretary, the Office of the National Coordinator for Health Information Technology (ONCHIT) is responsible for coordination of such reports. Likewise, through ONCHIT, HHS is preparing a larger Strategic Plan that will address the transformation of health care delivery through information technology.

This report meets the VA requirement to submit an approach through ONCHIT to make health information technologies available to rural and medically underserved communities. This report also provides VA's contribution to the larger HHS Strategic Plan that will provide recommendations to transforming health care delivery using information technology.

II. BACKGROUND—Statement Of Problem: Rural and Medically Underserved Requirements

The Rural Public Health Research Agenda of April 2004, held at the University of Pittsburgh Center for Rural Health Practice, identified the following core themes for Rural Public Health:

- Rural communities differ significantly across and within geographic regions. Such differences necessitate local solutions to local challenges that include economic factors, demographic makeup, population density, terrain, and distance from urban areas, community resources and public health presence.

- The vast majority of rural public health workers have no formal public health training. An additional barrier to needed education and training is the inability to take time away from often understaffed local health departments.

- There is a need for surveillance systems to be sensitive enough to address small number issues and broad enough to track emerging infections. The systems should have the capability of communicating across county or at state lines. [1]

According to the Health Resources and Services Administration (HRSA), "medically underserved" communities may be rural or urban in nature, and consist of residents experiencing a shortage of personal health services such as primary, mental or dental services, and may face cultural, linguistic, or economic barriers. See HRSA Definitions in Appendix A.

VA has always recognized that special care and attention is needed to address health delivery to these target populations. For instance, as part of the dramatic transformation of the Veterans Health Administration (VHA) health care delivery of the 1990's under the direction of Kenneth W. Kizer, M.D., M.P.H, the homeless veteran was recognized as an important recipient of VHA care. Half a decade ago, in Dr. Kizer's testimony to the U.S. House of Representatives Committee on Veterans Affairs' Subcommittee on Health, he stated VHA's fifth goal as:

> *VHA's fifth mission is to provide medical services and other support for homeless veterans. Today, VHA is the single largest direct care provider for homeless persons in the country, and we are a critically important – although often unrecognized – element in the nation's public safety net.* [2]

Likewise, at the 2004 National meeting of the VA Health Services Research and Development, VA researchers presented a study that demonstrated that health status scores are lower for veterans that live in rural settings when compared to scores for

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[1] The Rural Public Health Research Agenda, 2004, Bridging The Health Divide, University of Pittsburgh Center for Rural Health Practice, pp. 4-5

[22] Statement of Kenneth W. Kizer, M.D., M.P.H. Under Secretary For Health Department of Veterans Affairs on the Future of the Veterans Healthcare System before the Committee on Veterans Affairs' Subcommittee on Health U.S. House of Representatives June 17, 1998

other veterans. The study concluded that "innovative" strategies are needed to address the health needs of these veterans. An example of current innovation within VA is the creation of VHA Telehealth Toolkits (e.g., Telemental Health Toolkit, Teledermatology Toolkit, and Home Telehealth Toolkit.) These toolkits help VA provide timely, accessible, and convenient health care in a safe, appropriate, and cost-effective manner.[3]

The provision of telehealth technologies to veterans located in rural areas is but one area where VA has taken an active role to provide affordable technologies to address the needs of this population. On-going collaborations that will share the benefit of VA electronic health record capability with expanded populations provide other examples. VA is presently working with HHS Centers for Medicare and Medicaid Services (CMS) to develop a public domain electronic health record optimized for office-based practices and clinics. This tool, which would be available at substantially less expense then a commercial product, could directly support care to rural veterans and others who ordinarily would not benefit from such capabilities. It also would provide a strong basis from which VA could transfer lessons-learned and knowledge to other organizations and partners who work with rural and medically underserved communities.

Today VA continues to provide special programs and initiatives specifically designed to help homeless veterans live as self-sufficiently and independently as possible. Although limited to veterans and their dependents, VA's major homeless-specific programs constitute the largest integrated network of homeless treatment and assistance services in the country. The program includes aggressive outreach, clinical assessment and referral for healthcare, long-term case management and rehabilitation, employment and housing support. [4]

VA's success in providing health care services to populations that have challenges in seeking their own health care services within the traditional hospital and clinic environments is well documented. Approaches such as equipping mobile vans with clinical and patient care technologies provide unparalleled care in the veterans' home communities. VA has great breadth and depth in experience using health information technologies to support such programs. VA is well-poised to share its experience across government lines and in cooperation with DoD for the benefit of those rural and medically underserved communities that remain out of reach of traditional medicine delivery methods.

VA is reaching out through the State Veterans Homes by providing access to VistA for implementation as well as providing access to clinical information for those veterans residing in State Veterans Homes. VA supports The Computerized Patient Record System (CPRS) Read Only as a software tool which enables medical centers to grant

[3] http://vaww.va.gov/telehealth/toolkits.htm
[4]4http://vaww1.va.gov/homeless/

authorized users read-only access to veterans' individually-identifiable health information, and to restrict a user's access to a specific set of patient records. Over 50 State Veterans Homes now have CPRS Read Only access. Over 100 State Veterans Homes have expressed an interest in obtaining CPRS Read Only access to patient data in VistA for a limited number of their clinical staff. Work is proceeding to expand access in order to facilitate continuity of care.

III. THE VA ELECTRONIC HEALTH RECORD

VA is a leader in the provision of a world-class electronic health record (EHR). Recently, the Institute of Medicine (IOM) noted "VA's integrated health information system, including its framework for using performance measures to improve quality, is considered one of the best in the nation." Moreover, a 2004 survey conducted by the American College of Physician Executives resulted in the finding that while many physician executives and doctors "loathe" clinical information systems, VA clinicians provided a "notable outlier from the nexus of negativity."[5]

The current system, VistA provides clinical, financial and management system for the entire enterprise. VistA has enabled organizational transformation by providing the ability to respond to contemporary best practices with quantifiable system-wide measurement. An IOM Report provides that the single most important safety gain that could be realized by technology is the act of providers entering their own orders. VA had already implemented order entry; VistA permitted VA to quickly measure compliance across the enterprise and make the compliance measurement a performance measure for hospital directors and their supervisors. Utilizing VistA, VA is able to determine that VA's current measure of direct order entry of medication orders is at 93 percent. Other forms of quality performance measures are employed throughout VA and supported by VistA.

CPRSis the medical record component. CPRS is currently used in outpatient, inpatient, Mental Health, intensive care unit (ICU), Emergency Department, Clinic, Homecare, Nursing Home and other diverse environments. CPRS contains all components of the medical record, including but not limited to, laboratory, test results, medical images, decision support, bar code medication administration, progress notes, and appointments. CPRS permits VA clinicians to access a patient's record from anywhere within the health enterprise, at the point-of-care.

[5] Weber, David O., *Survey Reveals Physicians' Love/Hate Relationship with Technology*, The Physician Executive, March/April 2004.

VA is presently improving and modernizing VistA. VA is migrating its present-day VistA system to Health***e***Vet-VistA. Health***e***Vet-VistA will consist of VistA upon an improved platform that will be built with modern day information tools and languages. Most importantly, Health***e***Vet-VistA will utilize an enterprise architecture constructed to standardize data and core communications. Health***e***Vet-VistA will move away from a facility-centric model of data utilization to a patient-centric model that supports the real-time provision of health data to the point of care, wherever it is needed.

The IOM has identified the eight core capabilities that EHRs should possess. A cross-walk between the target IOM EHR and current VA EHR capabilities demonstrate that VA has achieved a "gold standard" EHR. See Table 1, below.

Table 1
EHR Capabilities

IOM EHR Capability	CPRS Capability
Health information and data	✓
Results management	✓
Orders management	✓
Decision support	✓
Electronic communication and connectivity	✓
Patient support	✓
Administrative processes (e.g., scheduling)	✓
Reporting (e.g., disease surveillance, patient safety)	✓

Table 1, EHR Capabilities

Utilization of VA's EHR has yielded tremendous benefits to clinical care and permits VA to capture data for virtually every clinical performance measure. For instance, a comparison of VA patient care quality data from 2003 with Medicare data from 2003, and with the best reported performance of other health care systems in the U.S., shows that VA care sets the benchmark for every one of these clinical performance indicators. See Table 2, Comparison of Performance Indicators.

VA's Performance Compared to Non VA

Footnotes describe adjustments made to match indicator measures as closely as possible with Non VA benchmarks.

CLINICAL PERFORMANCE INDICATOR	VA Base (FY)	VA 2002	VA 2003	Medicare 2003	Best Reported Not VA or Medicare
Beta blocker on discharge after AMI	70% (96)	97%	98%	93%	94% NCQA (2002)
Breast cancer screening	68% (96)	80%	84%	75%	75% NCQA (2002)
Cervical cancer screening	64% (96)	89%	90%	62%	81% NCQA (2002)
Cholesterol screening in all patients	84% (00)	91%	91%	NA	73% BRFSS (1) (2001)
Cholesterol measured after AMI (2)	85% (00)	92%	94%	78%	79% NCQA (2002)
LDL Cholesterol less than 130 after AMI (2)	67% (00)	74%	78%	62%	61% NCQA (2002)
Colorectal cancer screening	34% (96)	64%	67%	NA	49% BRFSS (1) (2002)
Diabetes: HgbA1c done past year	59% (95)	94%	94%	85%	83% NCQA (2002)
Diabetes: Poor control (lower is better)	23% (99)	17%	15%	NA	34% NCQA (2002)
Diabetes: Cholesterol (LDL-C) measured	64% (98)	94%	95%	88%	85% NCQA (2002)
Diabetes: Cholesterol (LDL-C) controlled (<130)	23% (98)	70%	77%	63%	55% NCQA (2002)
Diabetes: Eye Exam	44% (95)	72%	75%	68%	52% NCQA (2002)
Diabetes: Renal Exam	36% (98)	78%	70% (3)	57%	52% NCQA (2002)
Hypertension: BP <= 140/90 most recent visit (4)	46% (00)	55%	68%	57%	58% NCQA (2002)
Immunizations: influenza, patients 65 and older (5)	27% (96)	74%	76%	69%	68% BRFSS (1) (2002)
Immunizations: pneumococcal, patients 65 and older (5)	26% (96)	87%	90%	65%	72.5% BRFSS (6) (2002)
Mental Health follow-up within 30 days of inpatient discharge	72% (98)	81%	77%	61%	74% NCQA (2002)

1) BRFSS scores are medians, VA scores are averages

2) VA evaluates cholesterol every 2 years ongoing (FY 01 if ever an AMI; FY 02 if AMI in past 5 years); NCQA evaluates 1st year after AMI only.

3) Drop in scores from 2002 levels are attributable to change in scoring methodology and not indicative of drop in performance.

4) VA Baseline reflects data collected based on a BP < 140/90. NCQA and VA changed in 02 to include both < and = in 2002.

5) For this comparison the score shown for the VA was calculated utilizing the NCQA methodology. It varies from the score on the Network Directors Performance Plan which includes additional populations (high risk patients regardless of age).

6) Represents "best" state results

SOURCE: VHA Office of Quality and Performance

IV. VA/DoD COLLABORATIVE APPROACHES TO FACILITATE THE TRANSFER OF AFFORDABLE HEALTH INFORMATION TECHNOLOGIES

VA and DoD each have a lengthy and comprehensive history developing and implementing electronic health record systems. This history translates into significant purchasing power and intellectual capital capable of exerting influence upon the health information technology (IT) industry as a whole. VA and DoD are the largest providers of health care in the United States. They have combined annual health care budgets in excess of $50 billion dollars, close to 12 million beneficiaries, and approximately 1600 health care sites and locations. Jointly and separately the Departments could exert significant influence of the provision of affordable technologies to the rural and medically underserved populations of this Nation.

A. Knowledge Transfer of Information Exchange Lessons

The Departments have made significant progress with development of electronic data exchanges. As such, VA and DoD are major catalysts in moving the industry toward use of interoperable health information technologies that improve health care delivery, patient safety and population health management. Within the Departments, the focus of this work has been on the creation of a seamless transition for those military service members who separate from service and seek care from VA. VA and DoD believe that their model of cooperation and joint development work can serve as a model among Federal agencies and for national cooperation.

In April 2002, the Departments adopted a strategy to develop interoperable electronic health records in 2005. This cross-cutting initiative, the VA/DoD Joint Electronic Health Records Plan, - Health***e***People (Federal), brings together the common adoption of standards, the development of interoperable data repositories, and joint or collaborative development of software applications to build a replicable model of data exchange technologies.

Federal Health Information Exchange

As part of this Plan, the Departments have worked on and are planning a series of progressive data exchange initiatives. In May of 2002, the Departments began the electronic transfer of clinical information from DoD to VA on separated or retired service members. As of June 2004, DoD has transferred clinical information on over 2.27 million prior service members to VA through the Federal Health Information Exchange (FHIE). FHIE continues to transfer clinical information from the DoD Composite

Healthcare System (CHCS) to the FHIE Data Repository, where it is available for viewing by VA clinicians using VA's CPRS. Claims adjudicators from the Veterans Benefit Administration also may access FHIE data using the Compensation and Pension Records Interchange system. The data available includes laboratory results, outpatient government and retail pharmacy prescriptions, radiology reports, admission, disposition and transfer messages, discharge summaries, consult reports, and outpatient coding elements from the Standard Ambulatory Data Record.

CHCS/VistA Data Sharing Interface

The Departments are presently engaged in the next step of their data exchange work: development of a real time bi-directional exchange of limited data sets for shared patients. The CHCS/VistA Data Sharing Interface (DSI) work will leverage already developed joint DoD/VA infrastructure, IT investments, VA/DoD test facilities, and existing personnel resources to quickly create a real-time, bi-directional interface. DSI will permit a Military Treatment Facility to share clinical data capable of computational actions with any VA medical center where a shared patient presents for care.

Other efforts under exploration include two projects in Hawaii. The first project includes development work that permits electronic transmission of pharmacy orders between Tripler Army Medical Center and VA Honolulu Medical Center for dispensing. This interface allows pharmacy orders written at the DoD facility to be transmitted electronically and filled at VA pharmacy. The second project, Janus, allows DoD providers to retrieve patient data from the VA's VistA patient record system. It provides a single Graphical User Interface (GUI) front end that links to a web application to pull data from VistA, to provide end-users on Tripler's CHCS with VistA patient record information.

Clinical Data Repository/Health Data Repository Interoperability

Beyond bi-directional data exchange in present systems, the Departments also are developing an interface between the DoD Clinical Data Repository of the Composite Health Care System II (CHCS II) and the VA Health Data Repository of Health***e***Vet-VistA. This initiative, known as "CHDR" (Clinical Data Repository/Health Data Repository) will support the real time bi-directional exchange of health data by the end of FY 2005. Phase I of this effort is the acquisition of a pharmacy prototype that will demonstrate the bi-directional exchange of computable outpatient pharmacy data, allergy information, and patient demographics in a lab environment by October 2004. The prototype is under development and on schedule. Phase II is the further development of the CHDR interface to enable its use in clinical settings. Using clinical decision support applications, providers in both Departments will be able to access and

use relevant clinical data to make important medical decisions for their patients, regardless of whether that information resides in VA or DoD systems.

Other Technologies

In addition to the data exchange initiatives that support data transfer of multiple clinical data sets, VA and DoD have completed and/or are enhancing several other technologies that support data exchange:

- **Laboratory:** Laboratory Data Sharing and Interoperability (LDSI) software permits electronic ordering of labs and results retrieval and permits the Departments to use one another as reference laboratories. This electronic capability eliminates the manual re-keying of data and contributes to patient safety.
- **Credentialing:** The Departments are demonstrating the use of a jointly developed interface between the DoD Centralized Credentials Quality Assurance System and the VA VetPro Credentialing system. This credentialing interface decreases the time and resources needed to process credentialed providers who practice in both VA/DoD health care settings.
- **Outpatient Pharmacy**: The Consolidated Mail Out Pharmacy (CMOP) application was jointly developed and is in use at three joint locations. CMOP supports VA's refilling of outpatient prescription medications from DoD's MTFs at the option of the beneficiary.

Much of this work can be shared with regional, state, and local entities through knowledge transfer of lessons learned. Both Departments are active in organizations and forums such as Healthcare Information and Management Systems Society and the annual Toward an Electronic Patient Record conference, and routinely share experiences at both national and local level industry events.

B. Adoption of Common Standards and Terminologies

VA and DoD have achieved the common adoption of an initial set of standards through the Consolidated Health Informatics (CHI) initiative. See Table 3. In partnership with HHS, VA and DoD are lead partners in the CHI project, one of the 24 eGov initiatives supporting the President's Management Agenda. The goal of the CHI initiative is to establish Federal health information interoperability standards as the basis for electronic health data transfer in Federal health activities and projects.

DoD and VA have established an initial joint strategy for data standards which focuses on maximizing the utilization of the CHI standards in future systems development and

acquisitions and influencing Standards Development Organizations (SDOs) in further standards work. The Target List of VA/DoD standards is attached at Appendix B. This Federal government effort has the potential to catalyze industry to adopt common terminologies and standards, thereby reducing software development costs and producing more affordable electronic health record technologies.

Table 3 Approved and Adopted CHI Standards

Standard	Description
HL7 2.4 and higher XML	Health Level 7 messaging standards to ensure that each Federal agency can share information that will improve coordinated care for patients such as entries of orders, scheduling appointments and tests and better coordination of the admittance, discharge and transfer of patients. Health Level & vocabulary standards for demographic information, units of measure, immunizations, and clinical encounter and HL7 Clinical Document Architecture standard for text base reports.
NCDCP Scripts	Certain National Council on Prescription Drug Programs (NCDCP) standards for ordering drugs from retail pharmacies to standardize information between health care providers and the pharmacies. These standards already have been adopted under the Health Insurance Portability and Accountability Act (HIPAA) of 1996, and will be adopted in the three Federal departments that aren't covered by HIPAA will also use the same standards.
IEEE1073	The Institute of Electrical and Electronics Engineers 1073 (IEEE1073) series of standards that allow for health care providers to plug medical devices into information and computer systems that allow health care providers to monitor information from an ICU or through telehealth services on Indian reservations, and in other circumstances.
LOINC	Laboratory Logical Observation Identifier Name Codes (LOINC) to standardize the electronic exchange of clinical laboratory results.
DICOM	Digital Imaging Communications in Medicine (DICOM) standards that enable images and associated diagnostic information to be retrieved and transferred from various manufacturers' devices as well as medical staff workstations.
SNOMED-CT	The College of American Pathologists Systematized Nomenclature Medicine Clinical Terms (SNOMED-CT) for laboratory results contents, non-laboratory interventions and procedures, anatomy, diagnosis and problems, and nursing.
HIPAA	The Health Insurance Portability and Accountability Act (HIPAA) transactions and code sets for electronic exchange of health related information to perform billing and administrative functions. These are the same standards now required under HIPAA for health plans, health clearinghouses and those health care providers who engage in certain electronic transactions.

Standard	Description
Federal Terminologies	A set of Federal terminologies related to medications, including the Food and Drug Administration's names and codes for ingredients, manufactured dosage forms, drug products and medication packages the National Library of Medicine's RxNORM for describing clinical drugs and the VA's National Drug File Reference Terminology (NDF-RT) for specific drug classifications.
HUGN	The Human Gene Nomenclature (HUGN) for exchanging information regarding the role of genes in biomedical research in the federal sector.
EPA Substance Abuse Registry System	The Environmental Protection Agency's Substance Registry System for non-medicinal chemicals of importance to health care.

VA and DoD work with the American National Standards Institute's (ANSI) and Healthcare Informatics Standards Board (HISB) to influence the adoption and implementation of nationally and internationally approved standards. Both VA and DoD participate on the Health Level Seven (HL7), an ANSI-accredited SDO that is working across the industry to establish a set of standard functions for electronic records. A VA nurse informaticist co-chairs the HL7 Electronic Health Record work group. VA and DoD representatives jointly chair the Governmental Projects Special Interest Group. VA representatives also co-chair the Conformance Special Interest Group, the Patient Administration Technical Committee, and Process Improvement.

VA and DoD also participate in the National Health Information Infrastructure (NHII) Taskforce.

The focus of the taskforce is on activities to help the health care industry create and adopt a national health information infrastructure. The purpose is to create a comprehensive knowledge-based network of interoperable systems capable of providing information for sound decision support available anywhere and at any time it is needed.

The benefits of NHII would be:

- Improved patient safety;
- Improved quality of care;
- Effectively shared decision support;
- Better understanding of health care costs;
- Monitored and protected pubic health; and
- Better informed health care consumers.

VA and DoD are working to define Department enterprise architectures that will fully align with the lines of business within each organization, including the delivery of health

care. VA and DoD are working closely to ensure that both enterprise architectures support health data interoperability as well as optimal information management to support shared care delivery.

Recognizing the value that coordinated delivery of health care would bring to our Nation, VA and DoD are actively engaged with HHS in the Federal Health Architecture (FHA) initiative. As co-leads of the electronic health record FHA subgroup, the Departments ensure that FHA activities are closely tied to Federal EHR initiatives. The FHA initiative has as its goals: 1) improved coordination and collaboration on government health IT solutions and investments; and 2) improved efficiency, standardization, reliability, and availability of comprehensive health information solutions. Part of this work includes identifying relevant data and technical industry standards, including those set by the private sector, that would support identified Federal business requirements.

The Departments' independent and collaborative efforts toward standards and architecture could serve as a model for local or regional architecture efforts in communities, and between private sector health care providers. Further, as is identified by the FHA initiative, a published Federal architecture based on common standards could induce private sector technology firms to reduce software development costs. This savings would then be passed on to health care providers across all settings, including those settings that necessarily rely on government (e.g., Federal, local or state) funding and assistance.

In addition to the joint work in this area conducted by VA and DoD, VA works with other Federal partners to promote the shared use of standards and terminologies. These efforts are represented in Appendix C. Through the above mentioned areas and participation in other varied professional and standards development organizations, VA and DoD seek to influence local, state, and national agencies as well as private industry to cooperate in adopting and implementing common standards.

C. TeleHealth Technologies Used for Long Distance Consultations and Distance Learning

Telehealth applications have been successfully utilized to extend medicine to remote areas of the world, disaster assistance teams, and ships at sea. Thus, telehealth technologies are uniquely suited to support the delivery of health care to rural and medically underserved populations that experience shortages in qualified resources within their local communities. Telehealth is defined as the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration. VA and DoD have several successful joint ventures in using telehealth technologies, as outlined in Appendix D.

V. OTHER VA APPROACHES – Knowledge and Technology Transfers to Benefit Target Populations

VA is a leader and innovator in the development of electronic health records, such as present system VistA and CPRS, as well as planned future systems Health**e**Vet-VistA and re-engineered CPRS. VA already has realized the target benefits of adopting EHRs and therefore is well-poised to participate in the expansion and integration of such technologies to larger health communities.

The universe of VA health care encompasses approximately 1300 sites of care that include 158 hospitals, over 850 community-based outpatient clinics, as well as nursing homes, domiciliaries, Vet Centers, and residential rehabilitation treatment programs. VA provides treatment to almost 5 million veterans each year among our 7.5 million veteran enrollees, who are older, sicker, and poorer than the age-matched U.S. population. This feat is made possible by VistA and other electronic health technologies.

Much of VA's VistA system was developed by VA government resources and therefore, the software exists in the public domain. Through on-going and active collaborations with a number of government and private-sector resources, VA encourages the proliferation of public domain technologies based on VistA code. This approach reduces expensive development costs associated with software and human capital requirements, and makes proven EHR technology an affordable and direct-transfer option to rural and medically underserved communities.

In addition to health information technology development, VA is a leader in large scale health information system implementation without compromise to patient safety or medical care. To the contrary, VA system implementation has improved the quality of care in measurable ways due, in large part, to data made available by VistA. As a result of this extensive system implementation experience, VA has also learned important lessons about the challenges of applying new technologies to existing clinical environments. VA has successfully taken a legacy system, the Decentralized Hospital Computer Program, and transformed it into modern VistA. A future version Health**e**Vet-VistA will soon be available and our public domain version of VistA, Health**e**People-VistA, is growing through national interest and collaboration opportunities.

VA shares these lessons in a number of forums. The following are examples of VA health information technologies that should be considered for coordinated knowledge and technology transfers to support these populations.

A. VistA for Use in Office-Based Practices and Clinics

In cooperation with HHS, VA is presently developing a public domain electronic health record based on core VistA technology. This project, will develop a product for release,

within the next 12 months that will be suitable for use in office-based practices and clinics, and for use in collecting quality measurements of health data. As public domain software, this VistA-based tool will provide an affordable option for technology acquisition by decreasing resources necessary for installation and maintenance and will support the delivery of health technology benefits to all Americans. Planned enhancements include a) enhancing the registration capabilities of the VistA product to meet the needs of clinicians in office-based practices and clinics , b) enhancing the OB/GYN and Pediatrics components of current VistA, c) simplifying VistA so that its installation and maintenance is easier, d) improving the management of chronic diseases and e) providing for communication of outcome measures to a Quality Improvement Clinical Data Warehouse. Such a tool may be adopted directly by physicians and clinics, or acquired by private sector entities that support them.

Other on-going examples of public domain technology transfers that could benefit rural and medically underserved communities, as well as the larger health community, are included in Appendix E.

B. My Health*e*Vet - The Personal Health Record

Personal health records are an important component of the provision of health information technologies. Personal health records provide patients the tool to collect and maintain personal health information and encourage active involvement in health care decisions that impact them. On Veterans Day 2003, VA released Phase 1 of My Health*e*Vet, a personal health record tool for veterans. Functional capabilities include: secure personal health journal, 18 million pages health and wellness information, benefits information, and online drug interaction checker. Future capabilities will include: online primary care appointing, Web-based pharmacy refill and renewal, appointment reminder, structured provider to patient messaging, and secure provider access to CPRS/VistA.

My Health*e*Vet will transform the delivery and management of care into a collaborative venture as veterans will eventually choose to share all or part of their information with family members, health advocates, or other private health care providers. This forward-thinking concept, that veterans are active participants, partners, and managers of their own health care, should be highlighted and explored for application to target communities.

C. Bar Code Medication Administration

Within hospitals, medication administration errors lend a substantial contribution to the rate of morbidity and mortality. One innovative technology developed and utilized by VA to address this is the VA Bar Code Medication Administration System (BCMA). BCMA was developed based on a prototype project created at the Colmery-O-Neil Veterans

Affairs Medical Center. BCMA is a wireless, point of care technology that uses an integrated bar code scanner. The bar scanner permits nurses to scan patient wristbands and medications while the software "checks" the transaction and validates what was given against the electronically stored order. BCMA ensures that each patient receives the correct medication and dose at the correct time by eliminating the need for reliance on short-term memory. BCMA technology will alert the nurse administering a medication if the software detects a mismatch between the identified patient and ordered medication dosage, time, or drug. Order changes and updates are electronically communicated to the nurse thereby eliminating time delays and increasing administration accuracy. Allergies, adverse reactions and special instructions also are tracked by BCMA as well as order changes that require staff attention. BCMA is fully compatible with VistA and CPRS.

VA-developed BCMA technology could greatly improve the efficiency by which care is delivered in hospitals and other settings across sites. Benefits include:

- Increasing accuracy of medication administration;
- Increasing the information available to clinical staff at the patient point-of-care;
- Reducing wasted medications;
- Improving communication between Nursing and Pharmacy staffs;
- Providing a real-time list of orders for medication administration;
- Recording refused and held medications and reasons;
- Recording missing doses and sending the request electronically to the Pharmacy; and
- Providing a point-of-care, real time data entry/retrieval system.

D. Telehealth/Telemedicine

Telehealth makes up a significant component in how VA intends to fulfill its mission to care for veteran patients. Telehealth involves the provision of health care services when patient and provider are separated in time and/or place, and take place using electronic media. Telemedicine is included within the broader rubric of telehealth. Within VA, telehealth transactions most often involve care between all professional groups and patients, not just physicians. The expansion of telehealth is an important part of the mission of VA, and directly supports coordinated delivery of care.

There are significant clinical and business barriers to the expansion of telehealth services that VA is addressing. For instance, outside of federal health care delivery locations, state licensure requirements often prohibit practice of medicine or nursing across state lines. Inadequate coding and reimbursement structures are examples of business barriers to telemedicine expansion.

The computerized medical record is a critical component to VA's strategy for the expansion of telehealth. For example, using videoconferencing to connect a patient with a provider situated many hundreds of miles away could not take place safely and effectively without having the patient's health record, laboratory results and clinical images available. This transaction would be of greater benefit if the medical record existed in multi-media format.

The concept of telehealth in VA is absolutely congruent with VA's transition to a computerized patient *health* record from a computerized patient *medical* record. This record is currently configured to operate within the context of clinics and hospitals. VA is working to expand the concept of the multi-media record into the home using home-telehealth technologies and My Health***e***Vet. In VA, technology is not the driver; rather, technology is supportive of the way in which VA meets the changing nature of the health needs of veteran patients. Veteran patients have predominantly chronic diseases that are being treated in non-hospital settings. VA telehealth is expanding to meet these needs in the settings where they are needed most.

E. VistA Imaging Technology

The VistA Imaging System is a system that enables the sharing, storing and retrieval of clinical images. VistA Imaging is a critical component to the VA vision of the multi-media patient health record; it will support both conventional and telehealth-based health care delivery.

VistA Imaging is a VA developed tool that integrates traditional medical chart information with medical images of all kinds, including x-rays, pathology slides, cardiology motion views, wound photos, and pictures acquired during endoscopy, surgery, and eye exams. Document scanning incorporates handwritten records, diagrams, and outside medical reports in online records. VistA Imaging permits a remote consulting physician to have access to clinical images for diagnosis and treatment – an invaluable tool for the provision of care to remote rural and medically underserved populations. VistA Imaging workstations are deployed throughout VA hospitals to capture and display medical images from across multiple specialties. VistA Imaging also uses the Digital Imaging and Communications in Medicine (DICOM) standards to interface directly other imaging equipment including CT, MRI, Ultrasound and X-ray.

F. Support of Community and Regional Setting Broad Data Exchange Initiatives

VA presently participates in a number of data exchange initiatives that involve community-based private or government organizations. Although VA is not exchanging data with these organizations per se, close collaboration provides invaluable technology

transfer and data exchange lessons (e.g., data security and patient privacy lessons) in settings where they are needed, improving patient care to the those populations within the communities and serving as a framework model of collaboration that other communities could replicate. Examples of on-going data exchange initiatives are included in Appendix F.

G. Contracting Incentives With Private Providers

As a purchaser of clinical services, the Federal government contracts with private sector providers to deliver care to its covered lives. In developing contracting incentives with private providers, initial activity within VA will include assessing all contracts for covered care. Potential benefits to be gained from incentives for use of health IT within these contracts include gains in quality and efficiency in caring for covered veterans. VA recognizes strong similarities between the use of incentives within contracting and the incentives within reimbursement. In an effort to foster strategic alignment and to decrease the risk of multiple Federal incentives methodologies impacting the VA business partners, VA will explore aligning its contract incentives with the reimbursement incentives as established by CMS, DoD, and other Federal agencies.

VI. Summary and Recommendations

VA and DoD are the largest health care providers in the Nation. As such, they are uniquely positioned to influence health delivery from a national standpoint. In consideration of the identified joint approaches the Departments could take to make affordable health technologies available to rural and medically underserved communities, the following is recommended:

- Capture lessons learned, including technical and resource identification, of data sharing initiatives. Where appropriate, conduct technology transfers to private sector and state and local levels as a means of providing affordable technologies to these areas.
- Continue joint standards adoption work to leverage the immense capability to influence the vendor community in the development of affordable health technologies.
- Continue utilization and development of telehealth technologies to be used in the direct provision of care to geographically remote areas, and areas that are underserved by health delivery services.

In addition to the joint work conducted with DoD, VA is a recognized leader in the development of health information technologies and health information systems. As such, VA is well positioned to do the following:

- Continue efforts to share health information technologies that are free and available to the general health care community at no cost for the benefit of all patients. This will be accomplished through the continued development of electronic health record software and technologies, and interoperable health applications. Continue to support the development of software that remains in the public domain. These include VistA, Health***e***Vet-VistA, Health***e***People-VistA, the collaborative HHS/VA VistA-based tool for office-based practices and clinics, and CPRS.
- Continue development of health information technologies that assist in the provision of care to remote populations. These include VistA Imaging and telehealth applications.
- Continue active collaborations with regional and community based health organizations that transfer technologies, explore data standardization efforts, and increase effective health data sharing.
- Continue development and enhancement of personal health record technologies, such as My Health***e***Vet, which empower veterans and health care consumers to become active participants in the health delivery process.
- Capture and transfer important lessons-learned from extensive system implementation and migration.

APPENDIX A - DEFINITIONS (Health Resources and Services Administration)

i. **Medically Underserved Areas (MUA)** may be a whole county or a group of contiguous counties, a group of county or civil divisions or a group of urban census tracts in which residents have a shortage of personal health services.

ii. **Health Professional Shortage Areas (HPSAs)** may have shortages of primary medical care, dental or mental health providers and may be urban or rural areas, population groups or medical or other public facilities.

iii. **Medically Underserved Populations (MUPs)** may include groups of persons who face economic, cultural or linguistic barriers to health care.

APPENDIX B - TARGET VA/DoD STANDARDS PROFILE

	Standards Relevant to Information Sharing	
Category/Sub-category	**Service Area**	**Standards**
Information Standards		
Message Format	Clinical Information Electronic Data Interchange (EDI)	HL7 v2.4 (XML encoding preferred)
	Medical EDI	ANSI ASC X12N 270, 271, 276, 277, 278, 820, 834, 835, 837 FIPS Pub 161-2 NCPDP Telecommunication Standard Implementation Guide v5.1 HL7 v2.4 (XML encoding preferred)
	Medical Still-Imagery EDI	DICOM v3.0 JPEG 2000
Data Representation Standards		
Clinical Data Representation	Drug Codes	NDC
	Lab and Clinical Observation Codes	LOINC
	Mental Disorder Codes	DSM-IV
	Multiaxial Medical Nomenclature	SNOMED, SNOMED-RT
	Outpatient Procedure	CPT-4
	Patient Diagnosis	ICD-9-CM
	Dental Codes	CDT-4
	Ancillary Services Reporting and Claims Processing	HCPCS
	Revenue Codes and Workload Weights	RBRVS

Standards Relevant to Information Sharing		
Category/Sub-category	**Service Area**	**Standards**
Information Modeling and Metadata	Object and Data Modeling	FIPS Pub 184 (IDEF1X) OMG UML v1.4 OMG XMI
Security Standards		
	Authentication	FIPS Pub 83, 112 IETF RFC 1510, 2138, 2289, 2402, 2633 ISO/IEC 7816 Parts 1-10 Open Group C311
	Accountability	ISO/IEC 10164-8
	Data Integrity and Non-repudiation	FIPS Pub 180-1, 186-2 IETF RFC 2246, 2402, 2406, 2633 IEEE 802.10 ITU-T X.509 (2000)/ISO/IEC 9594-8:2001 IETF RFC 2459
	Confidentiality	FIPS Pub 46-3, 74 , 140-2 , 185, 186-2 IETF RFC 2420, 2559, 2633 ITU-T X.509 (2000)/ISO/IEC 9594-8:2001 IETF RFC 2459
	Certification	ISO/IEC 15408 FIPS Pub 140-2
	Security Management	ISO/IEC 10164-8
Technical Standards		
Communications	Collaborative Communications	ITU-T.120, T.122, T.124, T.125
	Directory Services	IETF RFC 1034, 1035 (DNS) IETF RFC 1777 (LDAP) ITU-T X.500
	Internet Transport Services	IETF RFC 791, 793, 919, 922, 950, 959, 1112 (TCP/IP) IETF RFC 2131 (DHCP) IETF RFC 792 (ICMP)
	File Transfer	IETF RFC 959, 2228 (FTP)
	Electronic Mail	IETF RFC 821, 1869, 1870 (SMTP)
	Video Teleconferencing	ITU-T H.221, H.230, H.242, H.243, H.244, H.261, H.263, H.320, H.323, G.711, G.722, G.728, T.120, T.122, T.124, T.125

	Standards Relevant to Information Sharing	
Category/Sub-category	**Service Area**	**Standards**
	Wireless	IEEE 802.11a, 802.11b
	Ethernet Standards	ISO/IEC 8802-3 (10-Base-T, Ethernet) IEEE 802.3u (100-Base-T, Fast Ethernet) IEEE 802.3ab (1000-Base-T, Gigabit Ethernet)
	Object Management Services	OMG CORBA v2.3.1 W3C SOAP
	Web File Sharing	IETF RFC 2616 (HTTP) ANSI/ISO/IEC 9636 series (CGI)
Information Processing	Document Distribution Format	MS Word (.doc) Portable Document Format (.PDF) Rich Text Format (.rtf)
	Data Management Services	ISO/IEC 9075-3
	Graphics Data Interchange	GIF JPEG File Interchange Format v1.02
	Video Compression	ISO/IEC 11172-, 2, 3 (MPEG1) ISO/IEC 13818 series (MPEG2)
	Document Interchange	W3C HTML, XML
	Graphics Services	ISO/IEC 8632-1, 3, 4 (CGM)

APPENDIX C - VA COLLABORATIVE STANDARDS AND TERMINOLOGY EFFORTS

i. **VA & NLM Memorandum Of Understanding (MOU) –** This MOU was put in place to establish a mechanism to support shared terminology-related services between the National Library of Medicine (NLM), National Institutes of Health (NIH) and VA.

ii. **VA & NCI MOU –** This MOU was put in place to support shared drug information and terminology-related services between the National Cancer Institute (NCI) and VA.

iii. **VA & FDA MOU** – National Drug File – This MOU was put in place to establish a formal collaboration between the Food and Drug Administration (FDA) and VA for the purpose of developing and implementing terminology standards for medication information.

APPENDIX D - VA/DOD TELEHEALTH TECHNOLOGIES

Teleradiology: Ongoing local initiatives include:

- Eisenhower Army Medical Center (Fort Gordon, GA) and the Augusta VA Medical Center.
- Blanchfield Army Community Hospital (Fort Campbell, KY) and VA in Kentucky.
- Moncrief Army Community Hospital (Ft. Jackson, SC) and the Columbia VAMC.
- The "I-25 Corridor Working Group" has begun connecting together the US Air Force Academy Hospital, clinics at Air Force Bases (Buckley, Schriever, Peterson, Malmstrom, and FE Warren), Evan Army Hospital (Fort Carson, CO) with VA clinics in La Junta and Pueblo CO, and VA Medical Centers in Denver CO and Cheyenne WY. This connection will enable the exchange of digital radiographs and MRIs. Denver VA Medical Center and US Air Force Academy have already starting exchanging images.
- Sacramento VAMC sends Emergency Room after-hours and weekend x-ray and CT images to Travis AFB's David Grant Medical Center over a point-to-point T1 line using dynamic compression technology. Radiology residents at DGMC make preliminary review and fax results back to VA. Final interpretations and dictations are performed by VA radiologists. This helps maintain workload requirements for Travis radiology residency program and improves quality of life for understaffed VAMC radiologists who have limited on-call responsibilities.

Telepsychiatry: Weed Army Community Hospital (Ft. Irwin, CA) is working with the Los Angeles VA Regional Office to establish a VA/DoD sharing agreement to perform Compensation and Pension examinations, utilizing telemedicine for psychiatric examinations on persons separating/retiring at Fort Irwin who require such evaluation.

Hawaii Integrated Federal Health Care Partnership: The Pacific Telehealth and Technology Hui was established in 1999 as a joint partnership of the VA Medical and Regional Office Center in Honolulu and Tripler Army Medical Center to manage joint Telehealth projects involving research, development, prototype, evaluation and technology transfer. Some of these efforts include two projects developed under a joint initiative with the Joslin Diabetes Center, one of the world's leading research centers for diabetes.

- The first project, the Joslin Vision Network (JVN), provides a platform for assessing the severity of diabetic retinopathy using a highly sophisticated digital camera to capture and transmit an image of the retina to a reading station for remote evaluation.
- The second, the joint Hui-Joslin initiative, called the Holopono program, demonstrates the use of Internet technology to manage follow-up care for patients with diabetes.

Alaska Federal Health Care Access Network: This initiative of the Alaska Federal Health Care Partnership is comprised of DoD, VA, Indian Health Service (IHS), the US Coast Guard and other state and Federal agencies. Its goal is to use new telecommunications and telemedicine technology to extend and improve access to health care service and information for over 200,000 Federal beneficiaries, especially Indian Health beneficiaries in remote areas. The project has linked 235 Federal and state health care sites into a statewide telemedicine system. Using state-of-the-art technology and equipment, member organizations have begun to send medical images, health information, and voice data to regional hospitals for remote diagnosis and consulting.

Case Management (Diabetes): The Joslin Vision Network (JVN) is a telemedicine application focused on increasing access of diabetic patients into appropriate eye care and represents a collaborative effort between DoD, VA, and Joslin Diabetes Center in Boston. The original proof-of-concept JVN system has evolved into a second-generation system using non-proprietary Microsoft hardware and software, which leverages the established Patient Archiving and Communications System infrastructure and implements the Comprehensive Diabetes Management Program proposed in the Chronic Care Model developed by Edward Wagner, M.D. Its six components are: (1) Coordination with community resources; (2) Strategic commitment of the organization; (3) Support of patient self-management; (4) Redesign of delivery system; (5) Clinical decision support; and (6) Clinical information systems. The JVN eye care system:

- Is currently deployed in 32 active remote imaging sites, with six established and certified reading centers distributed across ten different states, from Hawaii to New England;
- Represents participating sites associated with the DoD, Veterans Health Affairs and the Indian Health Service;
- Has allowed access to over 12,000 patients into the JVN eye care system since September 2001;
- JVN CDMP application is currently live at the Joslin Diabetes Center and Walter Reed Army Medical Center; and
- Provides significant opportunity, when leveraged with deployed teleconsultation systems, to realize substantial cost savings for treating chronic disease.

e-Learning: The Adult Nurse Practitioner Post Master's Program is a collaborative effort between VA and the Graduate School of School of Nursing, Uniformed Services University for the Health Sciences (USUHS), which provides a Nurse Practitioner Distance Learning educational curriculum for VA and DoD nurses. It demonstrated that students and teachers, separated by geographic distance, can participate fully in an effective and meaningful educational process using electronic technology for communication. To date 70 individuals have graduated; the last class in May 2004. This Fall USUHS will enable distance learning in support of the doctoral Nursing Science program for DoD and VA nurses. USUHS is also in the process of building a

distance learning component to their Master's in Public Health program that could be utilized by DoD and VA providers.

APPENDIX E - EXAMPLES OF VA PUBLIC DOMAIN TECHNOLOGY TRANSFERS

i. **District of Columbia Government** –Implementation of VistA in all DC Department of Health clinics over time. There are presently three locations that are fully implemented.

ii. **Indian Health Service** –Implementation of VistA Imaging and CPRS in Indian Health Service. This work also includes the convergence of two systems including: Women's Health; Mental Health; Patient Billing; and CPRS & Health Summaries.

iii. **American Samoa –** Implementation of VistA in Samoa LBJ Tropical Medicine Hospital.

iv. **State Government Health Departments –** Ongoing exploration and/or implementation of VistA/CPRS in state government health departments such as Washington, West Virginia, Los Angeles County, North Carolina, Rhode Island, and Texas.

v. **Association of American Medical Colleges (AAMC)/Affiliated Medical Schools –** On-going agreement with the AAMC and affiliated medical schools to form a working group and select initial pilot sites to explore use of VistA systems.

APPENDIX F - EXAMPLES OF VA DATA EXCHANGE INITIATIVES

i. **VHA & HHS Data Exchange** –Currently pilot testing the capability to extract VistA data maintained at the national Austin Automation Center to be fed into various public health databases and/or biosurveillance systems maintained by HHS, Centers for Disease Control (CDC), and State Health Departments, e.g. Bioterrorism/ National Electronic Disease Surveillance System.

ii. **Santa Barbara Care Data Exchange Pilot** – Preparing to pilot test the exchange of patient data between the VA Outpatient Clinic and a number of other partnering public and private sector health care organizations in Santa Barbara County, in collaboration with the California HealthCare Foundation and CareScience.

iii. **Community Patient Data Exchange Networks –** Exploring and collaborating with other patient data exchange systems in local communities around the country including:
   - Mesa County (California) Care Data Exchange;
   - Patient Safety Institute – Delaware & Puget Sound pilot tests; and
   - Indianapolis (Regenstrief) Patient Data Exchange.

iv. **VA and Center for Disease Control (CDC)** - The Department of Homeland Security designated CDC as the lead agency in March of 2004. VA has worked with CDC to identify a dataset electronically available within its clinical information systems to support syndromic analysis. To date, VA is the only multiple site health care organization (government or private sector) to successfully transfer data to the CDCs Bio-Sense database on a continual basis. VA provided a two-year historical data load for CDC to analyze and develop threshold algorithms, and since August 2003, has provided nightly uploads of previous daily activity from each medical center (170 hospitals and 1300+ clinics).

TABLE OF ACRONYMS

Description	Acronym
American National Standards Institute	ANSI
Bar Code Medication Administration System	BCMA
Centers for Disease Control	CDC
Centers for Medicare and Medicaid Services	CMS
CHCS-VistA Data Sharing Interface	DSI
Clinical Data Repository/Health Data Repository	CHDR
Composite Healthcare System	CHCS
Computerized Patient Record System	CPRS
Consolidated Health Informatics	CHI
Consolidated Mail-Out Pharmacy	CMOP
Department of Defense	DoD
Department of Health and Human Services	HHS
Department of Veterans Affairs	VA
Digital Imaging Communications in Medicine	DICOM
Electronic Health Record	HER
Environmental Protection Agency	EPA
Federal Health Architecture	FHA
Federal Health Information Exchange	FHIE
Food and Drug Administration	FDA
Graphical User Interface	GUI
Health Insurance Portability and	HIPAA

Description	Acronym
Accountability Act	
Health Level 7	HL7
Health Professional Shortage Areas	HPSA
Health Resources and Services Administration	HRSA
Healthcare Informatics Standards Board	HISB
Human Gene Nomenclature	HUGN
Indian Health Service	IHS
Information Technology	IT
Institute of Medicine	IOM
Lab Data Sharing and Interoperability	LDSI
Logical Observation Identifier Name Codes	LOINC
Medically Underserved Areas (MUA)	MUA
Medically Underserved Populations (MUPs)	MUP
Memorandum of Understanding	MOU
Military Treatment Facility	MTF
National Cancer Institute	NCI
National Council on Prescription Drug Programs	NCPDP
National Drug File Reference Terminology	NDF-RT
National Health Information Infrastructure	NHII
National Library of Medicine	NLM
Office of the National Coordinator for	ONCHIT

Description	Acronym
Health Information Technology	
Standards Development Organization	SDO
Systematized Nomenclature Medicine Clinical Terms	SNOMED-CT
The Institute of Electrical and Electronics Engineers	IEEE
Uniformed Services University for the Health Sciences	USUHS
Veterans Health Information Systems and Technology Architecture	VistA

APPROVE/DISAPPROVE:

_____

Anthony J. Principi Date
Secretary
Department of Veterans Affairs

ATTACHMENT 3:

Report from the Department of Defense

UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND
READINESS

JUL 16 2004

The Honorable Tommy Thompson
Secretary of Department of Health and Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201

Dear Mr. Secretary:

The attached report responds to the President's Executive Order on "Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator," dated April 27, 2004. The Executive Order directed DoD and VA to "report on the approaches the Departments could take to work more actively with the private sector to make their health information systems available as an affordable option for providers in rural and medically underserved communities." DoD has implemented health information technology in remote areas throughout the world. This experience and lessons learned will be shared with the Office of the National Coordinator for Health Information Technology (ONCHIT), HHS.

We look forward to our continued collaboration with the Department of Health and Human Services and the ONCHIT.

Sincerely,

David S. C. Chu

Attachment:
As stated

Report on Approaches to Work with the Private Sector to Make Health Information Systems Available and Affordable to Rural and Medically Underserved Communities

July 6, 2004

Contents

Appendices

Tables

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I. Executive Summary

By Executive Order, the President directed that the Departments of Veterans Affairs (VA) and Defense (DoD) shall jointly report to the Office of the National Coordinator for Health Information Technology (ONCHIT) on the approaches the Departments could take to transform clinical practice and healthcare delivery in rural and medically underserved communities through the use of affordable health information systems. This report recommends the need for a common "blueprint" or "road map" from which all interested parties can proceed. Further, the report recommends approaches that focus on standards (e.g. data, security, messaging, technical, and communication) and interoperability; infrastructure considerations (e.g., networks, hardware, and software); contracting incentives; technology transfer; and sharing of lessons learned.

DoD and VA serve as catalysts for changing how healthcare is delivered in the future; specifically as it relates to the use of health information technologies to improve access, healthcare delivery, population health management, and patient safety. ONCHIT is coordinating with DoD, VA, other federal agencies and organizations to develop: (a) a framework for securely exchanging health data through a common federal health infrastructure, (b) electronic health records, and (c) standards for data, security, technology, and communication.

DoD has successfully implemented various types of health information technologies in comparable environments and for similar purposes as those found in rural and medically underserved communities. Examples of these technologies include:

- Telehealth for radiology, mental health, dermatology, pathology, and dental consultations;
- Online personalized health record for beneficiary use;
- Bed regulation for disaster planning;
- Basic patient encounter documentation
- Pharmacy, radiology, and laboratory order entry and results retrieval for use in remote areas and small clinics;
- Pharmacy, radiology, and laboratory order entry and results retrieval, admissions and discharge, and appointments for use in small hospitals; and
- Online education offerings for healthcare providers

Technology products, outcomes, benefits, and cumulative knowledge should be shared with ONCHIT for use within the private sector and local/state organizations to help guide their planning efforts.

In response to the directive, DoD proposes the following approaches:

- DoD will collaborate and coordinate recommendations with ONCHIT in support of the development of a strategic plan.

- DoD will communicate, encourage, and incentivize industry business partners to actively support the President's agenda.

- The National Governors' Association (NGA) or a similar organization should establish a consortium of local and state authorities to develop a "blueprint" or "road map" targeted at healthcare delivery in rural and medically underserved communities – this blueprint will serve as a common business reference point from which information technology investment decisions can be made.

    - DoD should share with ONCHIT its health enterprise architecture and lessons learned with the NGA consortium, local and state governments, and private industry.

- DoD and VA should continue to aggressively participate with Standard Development Organizations (SDOs) in the development of national health data, technical, security, and communication standards that foster interoperability and data exchange.

- DoD and VA should continue to work with professional organizations such as Health Information Management System Society (HIMSS), American Medical Association (AMA), and support initiatives such as National Health Information Infrastructure (NHII) to facilitate the adoption and implementation of standards.

- DoD and VA should continue to share with the private sector experiences and lessons learned from the many ongoing health data exchange initiatives.

- Working with other federal agencies and organizations, DoD should assist in drafting templates of standard contract language for use nationally, which encourages industry to produce products and services that are scalable and applicable to the rural and underserved communities.

    - DoD will develop acquisition selection criteria which favorably consider those companies that agree to provide products and services that are applicable to targeted communities such as the rural and underserved.

- DoD recommends that the federal government establish regional or national contracting and acquisition centers of excellence to strengthen purchasing power (e.g., bulk buys) and sharing of contracting language and lessons learned.

- DoD and VA should share electronically based educational programs that serve to extend the use of professionals and paraprofessionals in remote areas and assist them in staying current on medically related topics.

- In coordination with ONCHIT, DoD should share lessons learned and clinical practice templates in various forums with national, regional, state, and local authorities and the private sector on such topics as:

    - Application of health information technologies in remote sites,
    - Management of information technologies in remote sites,
    - Implementing privacy and security measures,
    - Business process reengineering,
    - Unique infrastructure solutions,
    - Application of health standards in Health Information Technology (HIT),
    - Change management, and
    - Implementation challenges.

- ONCHIT, with input from DoD and VA, should lead federal efforts to develop and implement an electronic health record and common business rules.

- DoD should develop and implement the use of personal health records (e.g., TRICARE Online), demonstrating opportunities to educate providers and beneficiaries.

II. Introduction

On April 27, 2004, President Bush issued the Executive Order "*Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator."* The purpose of the Order was for "the development of an interoperable health information technology infrastructure to improve the quality and efficiency of healthcare." As part of this Order in Section 4(b), the President directed the Secretaries of the Departments of Veterans Affairs (VA) and Defense (DoD) to jointly report to the Office of the National Coordinator for Health Information Technology (ONCHIT) on the approaches the Departments could take to work more actively with the private sector to make their health information systems available as an affordable option for providers in rural and medically underserved communities. The Order requires the Departments to document their approach in a joint report within 90 days, by July 25, 2004. This report answers that requirement from the DoD perspective.

III. Background

As one of the nation's largest healthcare providers, DoD has a lengthy and comprehensive history working in remote and medically underserved areas throughout the world in peacetime and wartime. DoD has experience in applying innovative business and information technology solutions in such areas as capturing, storing, and securely transmitting patient data electronically; keeping providers in remote locations trained on the latest advances in medicine; educating patients long distance; medical surveillance; deploying unique infrastructure solutions, data aggregation and analysis; and conducting long-distance consultations. This history translates into significant intellectual capital capable of exerting influence upon the health IT industry, specifically for the purpose of improving healthcare, patient safety and population health management.

A. Rural and Underserved Requirements

Providers in rural and medically underserved communities encounter many and varied challenges in serving their communities. (Definitions are found in Appendix A.)

The Rural Public Health Research Agenda of April 2004, held at the University of Pittsburgh Center for Rural Health Practice, identified the following core themes for Rural Public Health:

- Rural communities differ significantly across and within geographic regions, necessitating local solutions to local challenges that include economic factors, demographic makeup, population density, terrain, and distance from urban areas, community resources, and public health presence.

- The vast majority of rural public health workers have little or no specialty training in public health, and an additional barrier to needed education and training is the inability to take time away from often understaffed local health departments.

- There is a need for surveillance systems to be sensitive enough to address small numbers issues and broad enough to track emerging infections. The systems should have the capability of communicating across county and state boundaries.

Technology, which has been instrumental in providing access to information and training in most other areas, is lacking in rural areas. As reported by the National Advisory Committee on Rural Health, fewer than half of public health agencies have adequate communications and infrastructures.

Medically underserved communities are areas in which residents have a shortage of personal health services. These communities may be in rural or urban settings. There may be a shortage of health professionals and/or economic, cultural, or linguistic barriers to healthcare. Access to care is an issue critical to improving health status throughout rural America. Access to specialty care is an issue for both provider and beneficiary in rural and medically underserved communities.

The Institute of Medicine is conducting a study on "The Future of Rural Healthcare," which is anticipated to include the development of "a conceptual framework for a core set of services and the essential infrastructure necessary to deliver those services to rural communities." When completed, this study could provide a basis for focusing federal and industry efforts to provide affordable options for providers in rural and medically underserved communities.

IV. Rural Health and Medically Underserved Target Architecture – "Blueprint" or "Roadmap"

Key to understanding and developing approaches and information technology strategies for improving healthcare delivery in rural and medically underserved communities is having a "blueprint" or "roadmap." The blueprint defines the business of healthcare delivery in rural and medically underserved communities today and at some point in the future. It highlights where supporting information technologies are required and what data, security, and communication standards should be adopted. The blueprint also serves as a common point of reference from which national, regional, state, and local authorities and the private sector can develop a "bridge" or plan to get from today to the future. Likewise, it supports fundamentally sound information technology decisions by minimizing the potential for duplication of effort and reducing costly system changes as needs evolve.

The Federal CIO Council defines the blueprint as an enterprise architecture (EA), "a strategic information asset base, which defines the business mission, the information necessary to perform the mission, the technologies necessary to perform the mission, and the transitional processes for implementing new technologies in response to the changing mission needs." The key components of the EA are:

- Accurate representation of the business environment, strategy, and critical success factors;
- Comprehensive documentation of business units and key processes;
- Views of the systems and data that support these processes; and
- A set of technology standards that define what technologies and products are approved for use within an organization, complemented by prescriptive, enterprise-wide guidelines on how to best apply these technology standards in creating business applications.

The Office of Management and Budget and the General Accounting Office have long advocated that effective use of an EA is a recognized hallmark of successful public and private organizations. DoD fully embraces the need for enterprise architecture(s) and is using them to modernize antiquated business processes and promote interoperability and information management. Relevant aspects of the DoD/Military Health System enterprise architecture can serve as a model for local or regional architecture efforts in communities and between private sector healthcare providers, and further the objectives of the National Health Information Infrastructure initiative.

An EA fosters interoperability, knowledge dissemination, enhances information security, collaboration of "best practices," and identification of healthcare information technology needs across the rural and medically underserved landscape.

V. Interoperability and Common Standards

A. Interoperability—Data Exchange

The VA and DoD have made significant progress with development of electronic data exchanges. Within the Departments, the focus of this work has been on the creation of a seamless transition for those military service members who separate from service and seek care from the VA. VA and DoD believe that their model of cooperation and joint development work can serve as a model among federal agencies and for national cooperation. Interoperability initiatives co-sponsored by the VA and DoD are described below.

1. Federal Health Information Exchange

In April 2002, the Departments adopted a strategy to develop interoperable electronic medical records by FY 2005. The plan provides for the joint adoption of standards, the development of interoperable data repositories, and joint or collaborative development of interoperable health information applications.

As part of this plan, the Departments have worked on and are planning a series of progressive data exchange initiatives. In May 2002, the Departments began the electronic transfer of clinical information from DoD to VA on separated or retired service members. As of June 2004, DoD has transferred clinical information on over 2.27 million prior service members to the VA through the Federal Health Information Exchange (FHIE). FHIE continues to transfer clinical information from the DoD Composite Healthcare System (CHCS) to the FHIE Data Repository, where it is available for viewing by VA clinicians using the VA's Computerized Patient Record System and claims adjudicators from the Veterans Benefit Administration using the Compensation and Pension Records Interchange system. DoD has transmitted data on over 2.27 million separated service members containing information on:

- Demographic data (name, patient, category, social security number, date of birth, sex, race, religion, address, marital status, and primary language);
- Laboratory results (clinical chemistry, blood bank information, microbiology, surgical pathology, and cytology);
- Outpatient pharmacy data (Military Treatment Facilities [MTF]), DoD mail-order pharmacy, and retail pharmacy data);

- Allergy information;
- Radiology results;
- Discharge summaries (patient history, diagnosis, and procedures);
- Consult reports (referring physician and physical findings);
- Admission, discharge, and transfer information (demographic data, admission data, and discharge data); and
- Standard Ambulatory Data Record (SADR) (ICD-9 diagnosis and CPT-4 procedure codes, treatment provider, encounter date and time, and clinical service).

The Departments are presently engaged in work that will support a real-time, bi-directional exchange of limited data sets between DoD and VA on shared patients. The CHCS/VistA Data Sharing Interface (DSI) work includes plans to re-use jointly developed DoD/VA infrastructure, numerous information technology (IT) investments, VA/DoD test facilities, and existing personnel resources to quickly create a real-time, bi-directional interface to permit a MTF to share clinical data capable of computational actions with its associated VA medical facility.

2. Clinical/Health Data Repository

Beyond bi-directional data exchange in present systems, the Departments also are developing an interface between the DoD Clinical Data Repository and the VA Health Data Repository. This initiative, known as "CHDR," will support the bi-directional exchange of health data. Phase I of this effort is the acquisition of a pharmacy prototype that will demonstrate the bi-directional exchange of computable outpatient pharmacy data, allergy information, and patient demographics in a laboratory environment by October 2004. The prototype is under development and on schedule. Phase II is the further development of the CHDR interface to enable its use in clinical settings. Using clinical decision support applications, providers in both departments will be able to access and use relevant clinical data to make important medical decisions for their patients, regardless of whether that information resides in the VA or the DoD system.

3. Laboratory Data Sharing Interoperability

The Departments are also engaged in an initiative that allows DoD or VA to use the other Department as a reference laboratory. The Laboratory Data Sharing Initiative (LDSI) facilitates the electronic transfer/sharing of laboratory order entry and results retrieval between DoD, VA, and commercial reference laboratories. LDSI enables either VA or DoD to generate an order in their system, send it electronically to the other Department, and receive the results electronically. This

eliminates re-keying of data and contributes to patient safety. Successful testing has been completed in Hawaii, and LDSI is being deployed to DoD and selected joint venture sites. In the future, LDSI will be enhanced to include additional types of laboratory tests (e.g., microbiology and anatomic pathology).

4. Consolidated Mail Outpatient Pharmacy

DoD and VA conducted tests at three locations to determine the impact of DoD shifting some of its pharmacy refill workload to a VA regional Consolidated Mail Outpatient Pharmacy (CMOP). The pilot test ran for one year and received favorable feedback from both beneficiaries and MTF staff. Many beneficiaries indicated a willingness to use CMOP. In FY04 the continuation of the CMOP program is at the discretion of the MTF commander at each of the pilot sites.

5. Centralized Credentials Quality Assurance Systems/VetPro

DoD and VA are exploring the merits of electronically sharing credentialing information. The purpose is to improve the initial process for provider credentialing. When a credentialed provider in either DoD or VA requests credentials at a facility in the other Department, the Credentialler electronically requests the file from the Department where the provider is currently credentialed. Shared data sets (~ 60 data elements) are sent electronically to prepopulate the provider's new file. The data is validated and the Department sends a message stating either that all data was accepted or that any discrepancies exist including changes made by the provider. The need for the provider to write the same information twice is eliminated. The pilot at three sites was concluded in June 2004. CCQAS/VetPro is now being implemented in the San Antonio area.

6. Federal Health Architecture Electronic Health Record Initiative

In addition, DoD and VA co-chair the Department of Health and Human Services sponsored Federal Health Architecture, Electronic Health Records Working Group. The working group is responsible for recommending a target healthcare services electronic health record architecture. This work is an eGov initiative in support of the President's Management Agenda.

The by-products of much of the work the Departments have done can be shared with regional, state, and local entities in knowledge transfer and lessons learned. The Departments currently share this information through involvement at the national and

local levels in organizations such as the Healthcare Information and Management Systems Society and through forums such as the annual "Toward an Electronic Patient Record" conference.

B. Data, Security, Technical, and Communication Standards

In addition to the development of large-scale electronic data exchange systems, DoD and VA have achieved the common adoption of an initial set of standards through the Consolidated Health Informatics (CHI) initiative (See Table 1). DoD and VA are lead partners in the CHI project, one of the 24 eGov initiatives supporting the President's Management Agenda. The goal of the CHI initiative is to establish federal health information interoperability standards as the basis for electronic health data transfer in federal health activities and projects. Appendix B outlines those standards that are relevant to information sharing. DoD and VA have established an initial joint strategy for data standards that focuses on maximizing the utilization of the CHI standards in future systems development and acquisitions and influencing Standards Development Organizations (SDOs) in further standards work. Standardized data ensures that the definition of a data element is the same to all users. It is critical to the exchange of health information. This federal government effort has the potential to catalyze industry to adopt common terminologies and standards that will lead to increased utilization of the electronic medical record and enable the exchange of health information.

Table 1. Approved and Adopted CHI Standards

HL7 2.4 and higher XML	*Adopt Health Level 7 messaging standards to ensure that each federal agency can share information that will improve coordinated care for patients such as entries of orders, scheduling appointments and tests and better coordination of the admittance, discharge and transfer of patients.* *Adopt Health Level & vocabulary standards for demographic information, units of measure, immunizations, and clinical encounter and HL7 Clinical Document Architecture standard for text base reports.*
NCDCP Scripts	*Adopt certain National Council on Prescription Drug Programs (NCDCP) standards for ordering drugs from retail pharmacies to standardize information between healthcare providers and the pharmacies. These standards already have been adopted under the Health Insurance Portability and Accountability Act (HIPAA) of 1996, and today's announcement will make sure that parts of the three federal departments that aren't covered by HIPAA will also use the same standards.*
IEEE1073	*Adopt the Institute of Electrical and Electronics Engineers 1073 (IEEE1073) series of standards that allow for healthcare providers to plug medical devices into information and computer systems that allow healthcare providers to monitor information from an ICU or through telehealth services on Indian reservations, and in other circumstances.*
LOINC	*Adopt laboratory Logical Observation Identifier Name Codes (LOINC) to standardize the electronic exchange of clinical laboratory results.*
DICOM	*Adopt Digital Imaging Communications in Medicine (DICOM) standards that enable images and associated diagnostic information to be retrieved and transferred from various manufacturers' devices as well as medical staff workstations.*
SNOMED - CT	*The College of American Pathologists Systematized Nomenclature Medicine Clinical Terms (SNOMED-CT) for laboratory results contents, non-laboratory interventions and procedures, anatomy, diagnosis and problems, and nursing.*
HIPAA	*The Health Insurance Portability and Accountability (HIPAA) transactions and code sets for electronic exchange of health related information to perform billing and administrative functions. These are the same standards now required under HIPAA for health plans, health clearinghouses and those healthcare*

	providers who engage in certain electronic transactions.
Federal Terminologies	*A set of federal terminologies related to medications, including the Food and Drug Administration's names and codes for ingredients, manufactured dosage forms, drug products and medication packages the National Library of Medicine's RxNORM for describing clinical drugs and the Veterans Administration's National Drug File Reference Terminology (NDF-RT) for specific drug classifications.*
HUGN	*The Human Gene Nomenclature (HUGN) for exchanging information regarding the role of genes in biomedical research in the federal sector.*
EPA Substance Abuse Registry System	*The Environmental Protection Agency's Substance Registry System for non-medicinal chemicals of importance to healthcare .*

DoD and VA work with the American National Standards Institute's (ANSI) and Healthcare Informatics Standards Board to influence the adoption and implementation of nationally and internationally approved standards. DoD recognizes the value of participation with Health Level Seven (HL7), an ANSI accredited standards developer (ASD) that has distinguished itself as a leading SDO in healthcare. In addition to its historical prevalent messaging standards, HL7 has provided a forum for hosting and collaborating with several other SDOs with healthcare interests, such as IEEE.

In addition, DoD and VA also participate in the National Health Information Infrastructure (NHII) Taskforce. The focus of the taskforce is on activities to help the healthcare industry create and adopt a national health information infrastructure. The purpose is to create a comprehensive knowledge-based network of interoperable systems capable of providing information for sound decision support available anywhere and at any time it is needed. The benefits of NHII would be:

- Improved patient safety;
- Improved quality of care;
- Effectively shared decision support;
- Better understanding of healthcare costs;
- Monitored and protected public health; and
- Better informed healthcare consumers.

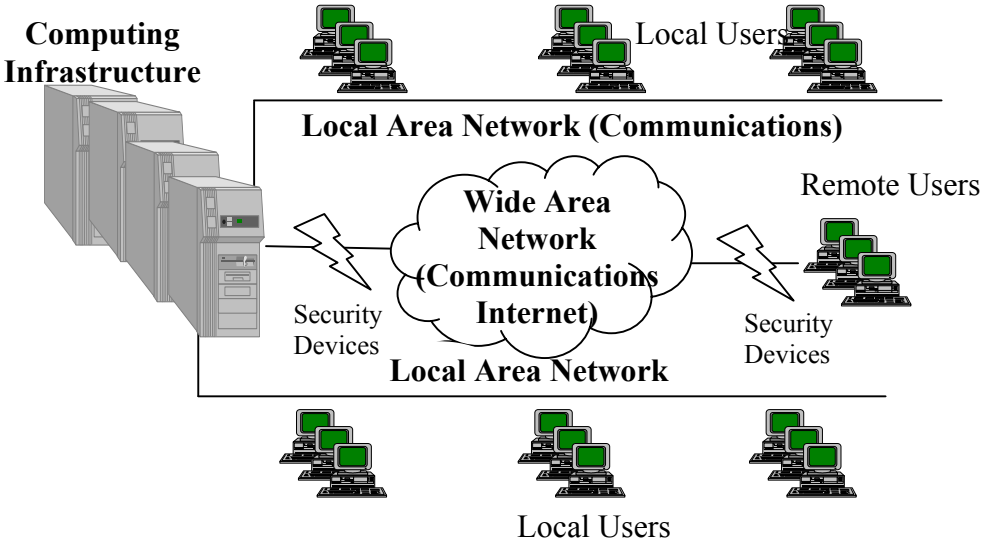
Through the above-mentioned areas and participation in other varied professional and standards development organizations, DoD and VA seek to influence local, state, and national agencies as well as private industry to cooperate in adopting and implementing common standards.

C. Infrastructure Considerations

The ability to securely exchange interoperable data that is understood the same by all users is predicated upon having a method of capturing, storing, and

securely transmitting and receiving data to and from somewhere else. The components to achieve this include computers, databases, servers, communication networks, Internet connectivity, and security firewalls; which together are termed information technology infrastructure. Figure 1 illustrates the components of infrastructure that must be in place to successfully exchange information.

Figure 1. Information Technology Infrastructure Components



DoD has a wealth of experience in developing and implementing common and unique infrastructure solutions that provide the foundation for all information exchange. The robustness and availability of this foundation is an absolute measure of success when implementing software applications. This experience can be shared with the private sector.

VI. DoD Health Information Technologies for Use in Different Environments

DoD has successfully used various types of health information technologies in different environments for different purposes. Whether these technologies are appropriate, affordable, and meet the needs of the rural and medically underserved communities must be determined based on the needs of rural and medically underserved communities and the target blueprint or architecture. The lessons learned and knowledge gained from the DoD experiences should continue to be shared with the private sector and local/state organizations to help guide efforts in these areas.

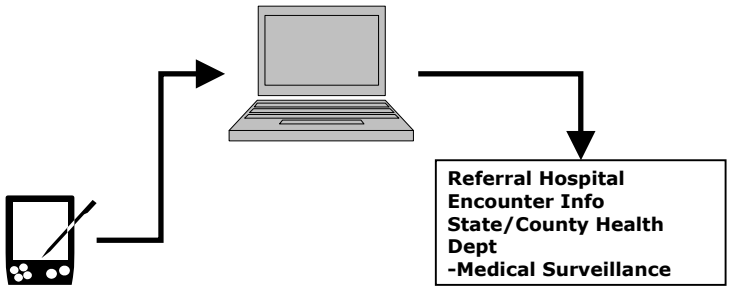
The intent of this section is to describe scenarios in which health information technologies have been used successfully by DoD in circumstances that may also be applicable to rural or underserved communities. These scenarios may be used as a basis for developing a blueprint or architecture for these communities. The scenarios

vary from use of basic health technology configurations to more complex telehealth technologies. Regardless of complexity, successful implementation of health information technology and exchange of data is often predicated upon: (a) user acceptance, (b) use of common standards, (c) quality of data, (d) flexible data structures, (e) a secure communications and computing infrastructure, (f) adequate training, and (g) thoughtful attention to change management.

A. Mobile Healthcare Provider Setting

DoD currently uses the mobile workstation model called the Composite Health Care System II (Theater), as depicted in Figure 2. This technology allows mobile military providers in remote areas to document healthcare (to include clinical order documentation) with a stand-alone notebook PC at the point of care. Patient data may be stored on the PC, downloaded from the device, and either transmitted to a mainframe database using encrypted technologies, or stored on a disk or storage device for transport with the individual. As patients move through the various levels of care from a small, forward-deployed unit in a combat setting back through successively larger and more sophisticated levels of care, their health information is accessible to providers at the receiving facilities, regardless of how remotely located from the original point of collection. Aggregate data from multiple patient encounters is used to monitor untoward medical incidents in a given area or population and report to appropriate leadership. The isolated conditions encountered in wartime or other overseas peacekeeping missions can be compared to the conditions in some rural healthcare environments and the need to transport the data to other facilities or providers may be applicable to situations such as the case of migrant workers.

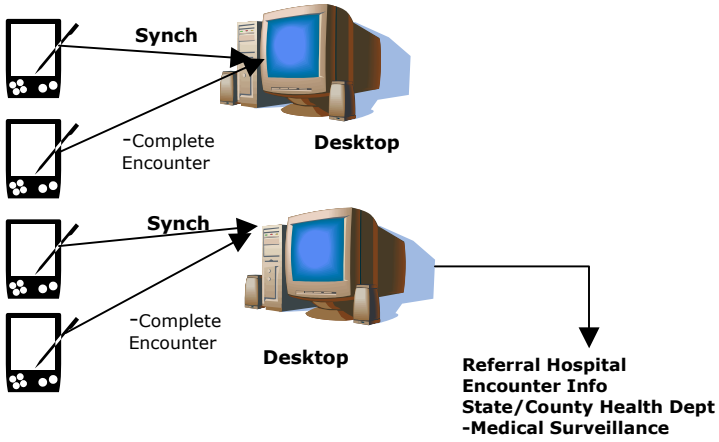
Figure 2. Mobile Workstation Model



B. Small Family Practice Clinic Setting

The small family practice clinic health information configuration supports a group of co-located providers with the ability to document and share healthcare encounter information, as illustrated in Figure 3. This model provides the same basic capabilities as the Mobile Workstation Model. It provides the ability to have a small database in the clinic where patient health record information can be accessed by any provider, thus providing continuity of care. Select data fields can be sorted and aggregated for population health management or medical surveillance. A local area network (LAN) would be required to support this model. The DoD CHCS II-T or the NT version, which provides limited ancillary order entry and results retrieval capabilities would apply to this environment as well.

Figure 3. Small Family Practice Clinic Model



C. Large Clinics and Smaller Hospitals

Larger clinics and smaller hospitals would benefit from an Electronic Health Record that provides full order entry, results retrieval, and ancillary workflow support (to include pharmacy, radiology, laboratory services, and alerts for drug-allergy and drug-drug interactions) such as in the DoD clinical system suite of capabilities. This capability has been successfully transferred to the United States Coast Guard.

A DoD capability that may have application in remote or rural areas is called TRANSCOM Regulating and Command and Control Evacuation System (TRAC2ES). This system provides visibility on bed status at local hospitals in a geographical area. A health information technology such as this would support better National Disaster Medical System reporting and give Homeland Defense greater visibility of hospital beds for regulating in disaster response situations.

D. TeleHealth Used for Long Distance Consultations and Distance Learning

Telehealth applications have been successfully utilized to extend medical care to remote areas of the world, disaster assistance teams, and ships at sea. Telehealth is defined as the use of electronic information and telecommunications technologies to support long-distance clinical healthcare, patient and professional health-related education, and public health and health administration. DoD has several successful joint ventures with the VA using telehealth technologies, as outlined in Appendix C.

For the DoD, telehealth provides medical support to service members in combat situations. The active-duty force has a special need for telehealth capabilities to support readiness missions in which medical care may not be readily available. Troops are often isolated and not able to access the level of care required for illness or injury. Use of telehealth puts a "virtual" medical component in the field, potentially saving life and limb. In less severe cases, telehealth may reduce the number of troops requiring evacuation for what would normally be routine medical care. Similar situations exist in rural and underserved environments, which could benefit from the use of telehealth. Appendix D provides a varied and impressive view of the benefits of Telehealth.

VII. Contracting Considerations

DoD has a wealth of experience in developing healthcare information technology acquisition strategies, performance based contracts, negotiated volume discounts, and contract management. Template contract language has been developed to support the DoD community in expediting contract awards and laying the foundation for interoperability. This information can be made available to the private sector.

VIII. Summary of Approaches and Knowledge Transfer

The following summarizes the DoD recommended approaches in collaboration with ONCHIT to make health information systems available as an affordable option for providers in rural and medically underserved communities. A number of these approaches focus on the transfer of knowledge gained from the experiences of DoD that can serve as a foundation for planning in support healthcare delivery in rural and medically underserved populations.

- DoD will collaborate and coordinate recommendations with ONCHIT in support of the development of a Strategic Plan.

- DoD will communicate, encourage and incentivize industry business partners to actively support the President's agenda.

- The National Governors Association (NGA) or a similar organization should establish a consortium of local and state authorities to develop a blueprint or roadmap targeted at healthcare delivery in rural and medically underserved communities – this blueprint will serve as a common business reference point from which information technology investment decisions can be made.

    - DoD should share with ONCHIT their health enterprise architecture and lessons learned with the NGA consortium, local and state governments, and private industry.

- DoD and VA should continue to aggressively participate with Standard Development Organizations (SDOs) in the development of national health data, technical, security, and communication standards, which foster interoperability and data exchange.

- DoD and VA should continue to work with professional organizations such as Health Information Management System Society (HIMSS), American Medical Association (AMA), and support initiatives such as National Health Information Infrastructure (NHII) to facilitate the adoption and implementation of standards.

- DoD and VA should continue to share with the private sector experiences and lessons learned from the many ongoing health data exchange initiatives.

- Working with other federal agencies and organizations, DoD should draft templates of standard contract language for use nationally, which encourages

industry to produce products and services that are scalable and applicable to the rural and underserved communities.

  - DoD will develop acquisition selection criteria which favorably consider those companies who agree to provide products and services that are applicable to targeted communities such as rural and underserved.

- DoD recommends that the federal government establish regional or national contracting and acquisition centers of excellence to strengthen purchasing power (e.g. bulk buys) and sharing of contracting language and lessons learned.

- DoD and VA should share electronically based educational programs, as in Appendix C, that serve to extend the use of professionals and paraprofessionals in remote areas and assist them in staying current on medically related topics.

- In coordination with ONCHIT, DoD should share lessons learned and clinical practice templates in various forums with national, regional, state and local authorities and the private sector on such topics as:

  - Application of health information technologies in remote sites:
  - Management of information technologies in remote sites;
  - Implementing privacy and security measures;
  - Business process reengineering;
  - Unique infrastructure solutions;
  - Application of health standards in HIT;
  - Change management; and
  - Implementation challenges.

- ONCHIT, with input from DoD and VA, should lead federal efforts to develop and implement an Electronic Health Record and common business rules (e.g., CHCS II); demonstrating a bi-directional exchange of health information in a secure manner and in keeping with applicable privacy regulations.

- DoD should develop and implement the use of personal health records (e.g., TRICARE Online), demonstrating opportunities to educate providers and beneficiaries.

IX. Considerations and Barriers

- Lack of a common health enterprise architecture for rural and medically underserved communities;
- Lack of communication and computing infrastructure;
- Incomplete standards to support data exchange;
- Lack of centralized funding/disparate funding streams across federal agencies;
- Lack of incentives for the private sector and managed care organizations to provide solutions; and
- Lack of national, state and local venues for knowledge transfer and sharing of lessons learned.

X. Summary

As two of the largest healthcare organizations in the nation, DoD and VA serve as catalysts for changing how healthcare is delivered in the future specifically as it relates to the use of health information technologies to improve access, healthcare delivery, population health management and patient safety. The health industry, to include rural and medically underserved communities, can benefit from the innovation, testing, standards development, health architectures, knowledge, and experience of the DoD and VA. Rural and medically underserved communities have unique health challenges with limited human and investment capital, which requires the attention of national, state, and local leaders. It is imperative that these challenges are articulated in a common framework or architecture so that available resources are invested judiciously and technical solutions provide the greatest flexibility and capabilities to meet future needs. DoD will actively work with the Department of Health and Human Services, specifically the ONCHIT, as they execute the mission as defined in the President's executive order.

XI. Appendices

APPENDIX A

DEFINITIONS

Medically Underserved Areas (MUAs) may be a whole county or a group of contiguous counties, a group of county or civil divisions or a group of urban census tracts in which residents have a shortage of personal health services.

Health Professional Shortage Areas (HPSAs) may have shortages of primary medical care, dental or mental health providers and may be urban or rural areas, population groups or medical or other public facilities.

Medically Underserved Populations (MUPs) may include groups of persons who face economic, cultural or linguistic barriers to healthcare.

APPENDIX B

TARGET DoD STANDARDS PROFILE

Standards Relevant to Information Sharing		
Category/Sub-category	**Service Area**	**Standards**
Information Standards		
Message Format	Clinical Information Electronic Data Interchange (EDI)	HL7 v2.4 (XML encoding preferred)
	Medical EDI	ANSI ASC X12N 270, 271, 276, 277, 278, 820, 834, 835, 837 FIPS Pub 161-2 NCPDP Telecommunication Standard Implementation Guide v5.1 HL7 v2.4 (XML encoding preferred)
	Medical Still-Imagery EDI	DICOM v3.0 JPEG 2000
Data Representation Standards		
Clinical Data Representation	Drug Codes	NDC
	Lab and Clinical Observation Codes	LOINC
	Mental Disorder Codes	DSM-IV
	Multiaxial Medical Nomenclature	SNOMED, SNOMED-RT
	Outpatient Procedure	CPT-4
	Patient Diagnosis	ICD-9-CM
	Dental Codes	CDT-4
	Ancillary Services Reporting and Claims Processing	HCPCS
	Revenue Codes and Workload Weights	RBRVS

Standards Relevant to Information Sharing		
Category/Sub-category	**Service Area**	**Standards**
Information Modeling and Metadata	Object and Data Modeling	FIPS Pub 184 (IDEF1X) OMG UML v1.4 OMG XMI
Security Standards		
	Authentication	FIPS Pub 83, 112 IETF RFC 1510, 2138, 2289, 2402, 2633 ISO/IEC 7816 Parts 1-10 Open Group C311
	Accountability	ISO/IEC 10164-8
	Data Integrity and Non-repudiation	FIPS Pub 180-1, 186-2 IETF RFC 2246, 2402, 2406, 2633 IEEE 802.10 ITU-T X.509 (2000)/ISO/IEC 9594-8:2001 IETF RFC 2459
	Confidentiality	FIPS Pub 46-3, 74 , 140-2 , 185, 186-2 IETF RFC 2420, 2559, 2633 ITU-T X.509 (2000)/ISO/IEC 9594-8:2001 IETF RFC 2459
	Certification	ISO/IEC 15408 FIPS Pub 140-2
	Security Management	ISO/IEC 10164-8
Technical Standards		
Communications	Collaborative Communications	ITU-T.120, T.122, T.124, T.125
	Directory Services	IETF RFC 1034, 1035 (DNS) IETF RFC 1777 (LDAP) ITU-T X.500
	Internet Transport Services	IETF RFC 791, 793, 919, 922, 950, 959, 1112 (TCP/IP) IETF RFC 2131 (DHCP) IETF RFC 792 (ICMP)
	File Transfer	IETF RFC 959, 2228 (FTP)
	Electronic Mail	IETF RFC 821, 1869, 1870 (SMTP)
	Video Teleconferencing	ITU-T H.221, H.230, H.242, H.243, H.244, H.261, H.263, H.320, H.323, G.711, G.722, G.728, T.120, T.122, T.124, T.125
	Wireless	IEEE 802.11a, 802.11b

Standards Relevant to Information Sharing		
Category/Sub-category	**Service Area**	**Standards**
	Ethernet Standards	ISO/IEC 8802-3 (10-Base-T, Ethernet) IEEE 802.3u (100-Base-T, Fast Ethernet) IEEE 802.3ab (1000-Base-T, Gigabit Ethernet)
	Object Management Services	OMG CORBA v2.3.1 W3C SOAP
	Web File Sharing	IETF RFC 2616 (HTTP) ANSI/ISO/IEC 9636 series (CGI)
Information Processing	Document Distribution Format	MS Word (.doc) Portable Document Format (.pdf) Rich Text Format (.rtf)
	Data Management Services	ISO/IEC 9075-3
	Graphics Data Interchange	GIF JPEG File Interchange Format v1.02
	Video Compression	ISO/IEC 11172-, 2, 3 (MPEG1) ISO/IEC 13818 series (MPEG2)
	Document Interchange	W3C HTML, XML
	Graphics Services	ISO/IEC 8632-1, 3, 4 (CGM)

APPENDIX C

VA/DoD TELEHEALTH PROJECTS

- VA-DoD Imaging Subgroup: This working group was established under the joint Military Health System (MHS) and VA Clinical Data Repository-Health Data Repository (CHDR) Working Integrated Product Team to develop a strategy for sharing medical and dental digital images associated with beneficiary electronic healthcare records. Comprised of functional and technical experts from each agency, the Imaging Subgroup has recognized that interoperability of digital images depends on utilization of a common standard called Digital Imaging Communications in Medicine (DICOM). The group has drafted a joint document identifying the DICOM conformance requirements that image acquisition vendors must meet in order to be recommended for purchase. Once approved for release to the field, this collaborative statement will provide greater influence on the marketplace than either agency could achieve alone. The benefit will be improved interoperability between DoD and VA digital imaging information systems.

- Teleradiology:
  - The Army's Southeast Regional Medical Command is working with the VA to support ongoing local initiatives specific to Teleradiology between the following:
    - Eisenhower Army Medical Center and the Augusta VA Hospital in Georgia,
    - Ft. Campbell and the VA in Kentucky, and
    - Ft. Jackson and the Columbia SC, VA (specific to CT Scans whereby Ft. Jackson sends images over a 100MB fiber link to the VA)
  - The "I-25 Corridor Working Group" has begun connecting together the USAF Academy Hospital (USAFA), clinics at Buckley, Schriever, Peterson, Malmstrom, and FE Warren AFBs, the hospital at Ft. Carson, VA medical clinics in La Junta and Pueblo CO, and VA Medical Centers in Denver CO and Cheyenne WY, to enable exchanging digital radiographs and MRIs, thus allowing workload sharing and rapid provision of remote specialist interpretation. VA Denver, USAFA, Peterson, and Carson have already starting exchanging images.

- Sacramento VA Medical Center (old Mather AFB, CA) sends Emergency Room after-hours and weekend x-ray and CT images to Travis AFB's David Grant Medical Center (DGMC) over a point-to-point T1 line using dynamic compression technology. Radiology residents at DGMC make preliminary review and fax results back to the VA. Final interpretations and dictations are performed by VA radiologists. This helps maintain workload requirements for Travis radiology residency program and improves quality of life for understaffed VA Medical and Regional Office Center (VAMC) radiologists who have limited on-call responsibilities.
- Madigan Army Medical Center is planning Teleradiology with the Seattle VA once both sites have updated their systems and have established connectivity

- Telepsychiatry: Weed Army Community Hospital (Ft. Irwin, CA) is working with the Los Angeles VA Regional Office to establish a VA/DoD sharing agreement to perform Compensation and Pension examinations, utilizing telemedicine for psychiatric examinations on persons separating/retiring at Fort Irwin who require such evaluation.

- Hawaii Integrated Federal Healthcare Partnership: The Pacific Telehealth and Technology Hui was established in 1999 as a joint partnership of the VAMC Honolulu and Tripler Army Medical Center (TAMC) to manage joint Telehealth projects involving research, development, prototype, evaluation and technology transfer. These efforts include:
  - Two projects developed under a joint initiative with the Joslin Diabetes Center, one of the world's leading research centers for diabetes. It is further described below in Case Management. The first project, the Joslin Vision Network (JVN), provides a platform for assessing the severity of diabetic retinopathy using a highly sophisticated digital camera to capture and transmit an image of the retina to a reading station for remote evaluation. The second, the joint Hui-Joslin initiative called the Holopono program, demonstrates the use of Internet technology to manage follow-up care for patients with diabetes.
  - A project that permits electronic transmission of pharmacy orders between TAMC and VAMC Honolulu for dispensing. This interface allows pharmacy orders written at the DoD facility to be transmitted electronically and filled at the VA pharmacy.
  - Janus, a project that allows DoD providers to retrieve patient data from the VA's VistA patient record system. It provides a single Graphical User Interface (GUI) front end that links to a web application to pull data from VistA to provide end-users on TAMC's Composite Healthcare System (CHCS) with VistA patient record information.

- Alaska Federal Healthcare Access Network: This initiative of the Alaska Federal Healthcare Partnership is comprised of DoD, VA, Indian Health Service (IHS), the US Coast Guard and other state and federal agencies. Its goal is to use new telecommunications and telemedicine technology to extend and improve access to healthcare service and information for over 200,000 federal beneficiaries. The project has linked 235 federal and state healthcare sites into a statewide telemedicine system. Using state-of-the-art technology and equipment, member organizations have begun to send medical images, health information, and voice data to regional hospitals for remote diagnosis and consulting.

- Case Management (Diabetes): The Joslin Vision Network (JVN) is a telemedicine application focused on increasing access of diabetic patients into appropriate eye care and represents a collaborative effort between the DoD, VA and Joslin Diabetes Center in Boston. The original proof-of-concept JVN system has evolved into a second-generation system using non-proprietary Microsoft hardware and software, which leverages the established Patient Archiving and Communications System infrastructure and implements the Comprehensive Diabetes Management Program (CDMP) proposed in the Chronic Care Model developed by Edward Wagner, M.D. Its six components are: (1) Coordination with community resources (2) Strategic commitment of the organization (3) Support of patient self-management (4) Redesign of delivery system (5) Clinical decision support and (6) Clinical information systems. The JVN eye care system:
  - Is currently deployed in 32 active remote imaging sites with six established and certified reading centers distributed across ten different states from Hawaii to New England,
  - Represents participating sites associated with the DoD, the Veterans Health Affairs and the IHS,
  - Has allowed access to over 12,000 patients into the JVN eye care system since September 2001,
  - JVN CDMP application is currently live at the Joslin Diabetes Center and Walter Reed Army Medical Center,
  - Provides significant opportunity, when leveraged with deployed teleconsultation systems, to realize substantial cost savings for treating chronic disease.

- e-Learning: The Adult Nurse Practitioner Post Master's Program is a collaborative effort between the VA and the Graduate School of School of Nursing, Uniformed Services University for the Health Sciences (USUHS), which provides a Nurse Practitioner Distance Learning educational curriculum for VA and DoD nurses. It demonstrated that students and teachers, separated by geographic distance, can participate fully in an effective and meaningful educational process using electronic technology for communication. USUHS enables distance learning in support of the doctoral Nursing Science program for DoD and VA nurses. USUHS is also in the process of building a distance learning component to their Master's in Public Health program that could be utilized by DoD and VA providers.

APPENDIX D

BENEFITS OF TELEHEALTH

The benefits of telehealth are varied and impressive. Though some are difficult to quantify as they are concerned with quality of care or military troop readiness, the following list highlights benefits that already have been demonstrated in a multitude of pilot projects throughout the world, not just in the military:

- Biosurveillance, and thus Homeland Defense capabilities, are enhanced by providing data feeds from electronic and telephone triage systems and teleconsultations.
- Travel costs associated with transportation to distant specialty providers is reduced.
- Scarce medical specialty and sub-specialty resources can be leveraged beyond the "brick and mortar" construct of medical care.
- On-duty time and medical readiness is increased as a result of reduction in time spent to obtain specialty medical care.
- Access to care is enhanced, especially where travel distances represent a significant barrier.
- Turnaround time for consultations is considerably faster (e.g. from 30 days to 72 hours).
- Unnecessary medical evacuations are reduced.
- Health services in the home and community-based care locations are augmented.
- Mortality and intensive-care bed days are reduced through utilization of electronic critical/intensive care monitoring (as shown in commercial studies).
- Costs of emergency care and inpatient hospital stays are decreased through more effective case management utilizing electronic home-health monitoring systems.
- For VA and DoD, the amount of specialty care provided to beneficiaries by the private sector is reduced, providing cost savings.
- The quality of residency teaching via an e-Learning platform enables gathering of relevant specialty cases for review and dramatically enhances provider education.

ATTACHMENT 4:

Federal Health Information Technology Programs

The Decade of Health Information Technology: Delivering Consumer-centric and Information-rich Health Care

Framework for Strategic Action

July 21, 2004

Attachment 4
Federal Health Information Technology Programs

The following report was issued by the National Coordinator for Health Information Technology under direction of Executive Order 13335, Incentives for the Use of Health Information Technology and Establishing the Position of the National Health Information Technology Coordinator, April 27, 2004.

The Office of the National Coordinator for Health Information Technology (ONCHIT) is responsible for coordinating federal activities relating to health information technology. These covered health information technology activities are defined as any effort in the federal government that meets one or more of the following criteria:

1. Efforts that use federal funds to design, develop, standardize, implement, maintain, operate, and/or enhance HIT (e.g., software, hardware or other technology) that is used inside or outside the federal government to deliver, monitor, improve, supply information to, interface with, or use information from a patient care encounter, including financial, clinical, or other information.
2. Efforts that use federal funds for projects or programs that evaluate, research, study, or otherwise assess the use, benefit, cost, consequences, or other aspects of the HIT defined in #1.
3. Efforts that use federal funds to educate, teach, train, or address human factors about or relating to the HIT described in #1.
4. Policies, rules, reports, advisories, or other documents that describe, discuss, or influence the use of the HIT defined in #1.
5. Partnerships, grants, contracts, initiatives, or awards between the federal government and/or its contractors with non-federal organizations, including state or local governments or agencies, private companies, or other entities that relate to HIT defined in #1.
6. Knowledge management of the experiences gained from HIT implementation across large, distributed health care networks such as DoD, VA, and the IHS will be brought to a central, accessible point.

Many different components of the federal government touch upon health care, so federal leadership in HIT needs to be focused and coordinated. While there is some integration of these efforts, until recently there has been neither a single voice for this effort nor a holistic set of goals for change. The National Coordinator for Health Information Technology has been given the responsibility for coordinating HIT efforts throughout the federal government. As part of the outreach effort, the programs, projects, and policies that involve HIT are being compiled

According to the FHA initiative and budget documents submitted to the Office of Management and Budget, total federal spending on HIT was over $900 million in FY2004. A list of identified federal HIT programs follows. Federal HIT initiatives range from supporting research in advanced HIT (e.g., high-speed Internet, imaging, and bioinformatics) to the development and use of EHR systems. Overall, the compilation in the following table shows that the federal government has played an active role in the evolution and use of HIT, and further analysis of agency obligations and programmatic activities suggests that there is additional HIT spending within federal grants and other activities. The implementation of this strategy is an opportunity to comprehensively identify HIT spending activities, and to better enable collaboration that leverages these efforts.

VA provides to physicians, registered nurses, dentists, optometrists, podiatrists, nurse anesthetists, physician assistants, and other staff an EHR system known as VistA. The VA's work on the evolution of this EHR and diagnostic imaging is leading the field. The VA first demonstrated the effectiveness of bar coding for improving patient safety in hospital drug administration. This success contributed to the FDA's development of regulation requiring bar codes on drug products.

Another example of federal leadership is DoD's Pharmacy Data Transaction Service (PDTS), which is linked to DoD's EHR system. This utilizes a centralized data repository that records information about prescriptions filled for DoD beneficiaries through Military Treatment Facilities (MTFs), the civilian pharmacy network, and the TRICARE Mail Order Pharmacy program. PDTS enhances patient safety and quality of medical care by reducing the likelihood of adverse drug-to-drug interactions, duplicate drugs prescribed to treat the same condition, and the same drug obtained from multiple sources. This system has detected more than 117,000 potential Level 1 drug interactions over the last three years.

Other innovative activities are under way in the federal government. DoD and VA utilize telehealth applications for radiology, mental health, dermatology, pathology, and dental; for provider/patient education interactions; and as provider extenders. IHS has had an electronic health information system for over 25 years. IHS is currently adapting an EHR to fit the special needs of its hospitals and clinics. CMS is developing programs to promote the adoption and effective use of HIT through the Doctors' Office Quality Information Technology (DOQ-IT) pilot project and the Medicare Care Management Performance demonstration.

Standards adoption has been a core federal program. HHS has acquired the license to SNOMED CT©, a medical terminology, for use throughout the U.S. The VA and DoD are developing interoperable health information systems to support the seamless transfer of health information and continuity of services for beneficiaries. To accelerate progress within the government, HHS, DoD, and VA are lead partners in the CHI, one of the 24 e-Gov initiatives supporting the President's Management Agenda. The goal of the CHI initiative is to establish federal health information interoperability standards as the basis for electronic health data transfer in federal health activities and projects, which will facilitate the adoption of these standards in products used in the private sector. These federal agencies also support the FHA effort to develop an interoperable and common architecture for HIT across agencies.

Federal agencies are also stimulating formation of private sector health information exchange. AHRQ will spend $50 million in FY2004 on HIT research and demonstration projects aimed at improving the safety, quality, efficiency, and effectiveness of care. Using a portion of these resources, AHRQ will establish a Health Information Technology Resource Center that will provide technical assistance, expert HIT support, educational services, and other support to HHS grantees. AHRQ will also fund five state-level HIT projects to support health information exchange across these communities. The Health Resources and Services Administrations is accelerating adoption and enabling

community health information exchange through several programs including Connecting Communities for Better Health, the BPHC Healthy Communities Access Program, and telehealth programs.

The tools to ensure advances in population health and research are evolving. NIH is working to ensure the development of an infrastructure to support clinical research that will interface with community health information exchange networks. CDC is facilitating the implementation of a public health information infrastructure in a variety of fronts. This effort is already demonstrating results; the reporting times have dropped from an average of 30 days to 1-2 days. Work on and support for the U.S. Department of Homeland Security's BioWatch and BioSense continues, solidifying the infrastructure needed to detect and respond to emerging diseases and a bioterrorist event. Also, CDC is advancing the development of the Public Health Information Network (PHIN), which supports the broad range of public health activities, including interoperability with clinical care. It now includes the National Electronic Disease Surveillance System as a surveillance component, which promotes the use of standards to advance development of efficient, integrated, and interoperable surveillance systems at federal, state, and local levels. BioSense, among other things, fosters the use of standards-based clinical care data for the early detection, localization, and investigation of emerging health events.

The federal government has also acted to develop tools to support personalized care for the consumer. This is being accomplished through Healthfinder and Medline Plus, access to clinical trial information; DoD's TRICARE Online (TOL), the enterprise-wide, secure, Internet portal for use by all DoD beneficiaries, providers, and managers worldwide to access available health care services, benefits, and information; and VA's My Health*e*Vet.

The following table represents a preliminary, non-exhaustive, list of federal (HHS, VA, and DoD) projects meeting these criteria. ONCHIT will compile a database of programs, projects, and policies from various sources. This information will be for planning, coordination, and knowledge transfer.

Agency/ Organization	Title of HIT Initiative	Description of Activities
Department of Health and Human Services **Assistant Secretary for Planning & Evaluation**		
ASPE	National Committee on Vital and Health Statistics (NCVHS)	Policy development and development of standards.
ASPE	National Health Information Infrastructure (NHII)	The NHII is an initiative to improve the effectiveness, efficiency, and overall quality of health and health care in the United States -- a comprehensive knowledge-based network of interoperable systems of clinical, public health, and personal health information that would improve decision making by making health information available when and where it is needed. (NHII has been incorporated into ONCHIT.)
ASPE	EHRs in Post-Acute and Long-Term Care	ASPE has contracted with the University of Colorado Health Sciences Center to evaluate the current status of electronic health information systems (EHIS) and electronic health records (EHRs) in post-acute and long-term care (PAC/LTC) settings. The project team has reviewed literature, conducted telephone interviews, and completed site visits to providers that have implemented EHIS/EHRs in PAC/LTC. The project also contracted with Apelon to conduct a pilot study of the issues of conforming the nursing home minimum data set (MDS v.2) to CHI standards.
ASPE	Conforming the Nursing Home Minimum Data Set v.3 to CHI-Endorsed Standards	ASPE and CMS will partner on a project to conform the MDS v.3 to CHI-endorsed standards.
Office of the Chief Information Officer (CIO)		
	Consolidated Health Informatics Initiative (CHI)	The goal of CHI is to establish federal health information interoperability standards as the basis for electronic health data transfer in all activities and projects and among all agencies and departments. The first phase involved establishing a set of existing clinical vocabularies and messaging standards enabling federal agencies to build interoperable federal health data systems.
	Federal Health Architecture (FHA)	TheFHA program will define an overarching framework and methodology that allows initiatives throughout several federal agencies to proceed coherently, establishing the target and standards for interoperability and communication that will unify the federal health community. The FHA will establish a government-wide road map to achieve the federal health community's mission through optimal performance of its core business processes within an efficient IT environment.
Council on the Application of Health Information Technology (CAHIT)		
CAHIT	Coordination HL7 balloting	CAHIT staff coordinated the HHS engagement with regard to the HL7 Electronic Health Record Special Interest Group.
CAHIT	EHR Acceleration Efforts	CAHIT staff coordinated a series of planning meetings to best position pertinent departmental HIT activities (either current or future) that hold the promise of accelerating EHR adoption.

Agency/ Organization	Title of HIT Initiative	Description of Activities
CAHIT	CHI Standards	CAHIT staff and membership, via council meetings, activities, and staff briefings ensured the universal integration of CHI standards in HHS agency activities and programs.
Agency for Healthcare Research and Quality (AHRQ)		
AHRQ	Transforming Healthcare Quality Through Information Technology (THQIT)	THQIT is a series of three grant programs (RFAs) released in FY04. The RFAs include the following: 1) demonstrating the value of HIT, 2) planning grants for future HIT implementations, and 3) providing HIT implementation grants for partnerships of three or more entities.
AHRQ	State and Regional Health IT Demonstrations	AHRQ recently issued a contract solicitation to establish and implement state and regional demonstrations of interoperable health information systems. In the Fall of 2004, AHRQ anticipates issuing up to five awards.
AHRQ	Health Information Technology Resource Center	The Health Information Technology Resource Center (HITRC) will provide a state-of-the-art service center for grantees and organizations that are engaged in health IT diffusion activities (e.g., research, diffusion, or adoption).
AHRQ	Coordination with CMS Medicare Care Management Performance (MCMP) Demonstration Project	AHRQ will be supporting a five-year evaluation of CMS's MCMP demonstration project to explore the integration of EHRs in the ambulatory environment.
AHRQ	Indian Health Service (IHS) - Resource and Patient Management System (RPMS)	AHRQ recently provided funding to the IHS to support needed enhancements to the IHS EHR. This investment will help to create a user-friendly data system that can provide community-specific health care data as well as track the health status of the patient population.
AHRQ	Patient Safety Health Care Information Technology Data Standards Program: Standards and Interoperability	This work on health data standards, done in coordination with the ASPE, will focus of the following four areas: 1) voluntary industry clinical messaging and terminology standards, 2) national standard nomenclature for drugs and biological products, 3) standards related to comprehensive clinical terminology, and 4) nomenclature and research related to accelerating the adoption of interoperable HIT systems.
AHRQ	Evidence Based Practice Center (EPC) - Evaluation of the Evidence Regarding Select Health IT Functions	AHRQ's EPC Program has embarked on a 13-month program to explore and determine the evidence base associated with certain HIT functions.
Centers for Medicare and Medicaid Services (CMS)		
CMS	Doctors' Office Quality - Information Technology (DOQ-IT)	A special study to develop an approach to promoting adoption and use of information technologies in the physician office and reporting of information to Quality Improvement Organizations (QIOs).
CMS	VistA – Office her	Modify / repackage VistA (the Veteran's Administration EHR software) for the physician office setting.
CMS	Medicare Care Management Performance Demonstration	Establish a three-year, pay-for-performance pilot with physicians to promote the adoption and effective use of HIT to improve the quality of patient care for chronically ill Medicare patients. CMS will offer financial incentives to physician offices that meet performance standards in delivery systems and outcomes.

Agency/ Organization	Title of HIT Initiative	Description of Activities
CMS	Physician self-referral exception: Phase II of physician self-referral regulations includes exception for community-wide health information systems	Removes the regulatory barrier to allow for the furnishing of technology items or services to physicians to enable their participation in community-wide health information systems.
CMS	E-prescribing hearings to develop, adopt, recognize, or modify initial e-prescribing standards. Pilot project to test initial standards.	Participate in NCVHS hearings regarding e-prescribing standards in 2004 and 2005. Develop, adopt, recognize, or modify initial uniform standards not later than Sept. 1, 2005. During 2006 calendar year, conduct pilot project to test initial e-prescribing standards, unless the Secretary determines the industry has adequate experience with such standards.
CMS	EMR Focus Groups	Pacific Consulting Group, under contract with CMS, will conduct 12 focus groups of providers to identify the issues and barriers that would prevent them from using electronic medical records, and suggestions they may have for addressing these issues. The focus groups will be organized as follows: three Part A, three Part B, three durable medical equipment (DME) providers, two rural providers, and one billing agent. Six of these focus groups will be in person, while six will meet via conference call. Focus groups are planned for the following cities: Boston or New York City, Florida or Atlanta, Chicago, Denver, San Francisco.
CMS	CMS Virtual Call Center	The goal of CMS' Virtual Call Center is to improve beneficiary telephone customer service through the implementation of various initiatives for efficient and effective handling of all types of inquiries. The first phase involves, among other things, improvements in the Web-based application that allows phone representatives to retrieve clinical information about the beneficiary (such as date of last pap smear or colonoscopy). The second phase involves allowing beneficiaries to access clinical information about themselves through a Web-based application.
Food and Drug Administration (FDA)		
FDA	Structured Product Labeling (SPL) for prescription products (e.g., accessible drug information)	The SPL provides information found in the approved FDA drug label or package insert in a computer-readable format for use in electronic prescribing and decision support.
FDA	Bar Coding for Prescription Products	Standardized labeling.
National Institutes of Health		
NIH	National Library of Medicine - Grants for Research, Training, and Access to Informatics Resources	Research grants and contracts for advanced computer technologies to facilitate access, storage, and use of biomedical information, and for the value derived from the adoption, diffusion, and utilization of HIT.
NIH	National Library of Medicine - Grants for Research, Training, and Access to Informatics Resources	Support for training of informatics researchers and developers.
NIH	National Library of Medicine - Grants for Research, Training, and Access to Informatics Resources	Support for Integrated Advanced Information Networks (IAIMS), Internet connections, and access to digital libraries.
NIH	National Library of Medicine - Development and Implementation of Controlled Clinical Vocabularies	Support for, and development of, selected CHI standard clinical vocabularies to enable ongoing maintenance and free use within the United States.

Agency/ Organization	Title of HIT Initiative	Description of Activities
NIH	National Library of Medicine - Development and Implementation of Controlled Clinical Vocabularies	Uniform distribution and mapping of HIPAA code sets, CHI standard vocabularies, HL7 code sets, and other important vocabularies within the UMLS Metathesaurus.
NIH	National Electronic Clinical Trials and Research (NECTAR) Network	NIH plans to develop NECTAR, which will link research sites and ultimately create a "national network of networks," in coordination with the national health information network, by which research information and findings will be shared and scientific collaborations facilitated. NECTAR includes a research workflow model, a common lexicon of standard vocabularies to describe medical and scientific events, and analytical and dissemination tools.
NIH	Cancer Biomedical Informatics Grid (caBIG)	caBIG is a virtual cancer research network of interconnected data, individuals, and organizations that will create a common, widely distributed infrastructure that facilitates the sharing of data and applications and thereby enhances productivity and efficiency of research. caBIG infrastructure is based on HHS CHI standards. caBIG is being pursued as a pilot program that involves NCI's caCORE central resources, over 40 of NCI's cancer centers, and the FDA. The NCI has created a standards-supporting infrastructure called caCORE. It is composed of HHS-established controlled vocabularies, standard data elements, and domain models.
Indian Health Service		
IHS	Integrated Behavioral Health System (BH)	The BH graphical user interface software application that includes the ability to track services provided by social work, alcohol/substance abuse counselors, psychologists, and psychiatrists. Application includes suicide tracking system (with bi-directional notification within HIPAA guidelines) as well as embedded guidelines. The requirements determination has been completed and the software development process will begin in FY04.
IHS	Patient Account Management System (PAMS)	The PAMS is an enhanced third-party billing system.
IHS	Clinical Indicator Reporting System (CIRS)	The CIRS is a robust reporting system that tracks over 40 indicators in a standard reporting format. The standards reporting format is a delimited file that exports locally into Excel and can be exported for regional aggregation.
IHS	Integrated Case Management System	An integrated case management application is being developed to facilitate three views of data: patient, provider, and population health. These systems will allow for integration of varied disease case management applications that currently exist (diabetes, asthma, immunizations, etc.).
IHS	National Data Warehouse Initiative	This Initiative is developing a data warehouse for use by epidemiologists, as well as clinical quality in order to enable analyses on quality improvement and interface with the clinical indicator reporting system.
IHS	Resource and Patient Management System (RPMS)	RPMS is the hospital information system utilized by 49 hospitals, 221 health centers, 120 health stations, and 170 Alaska village clinics.

Agency/ Organization	Title of HIT Initiative	Description of Activities
IHS	IHS - EHR Initiative	IHS-EHR provides order entry, results reporting, encounter documentation, and other clinical functionality to IHS, tribal, and urban Indian health care providers. IHS-EHR is a component of the Resource and Patient Management System (RPMS), IHS's enterprise health information system.
Health Services and Resource Administration		
HRSA	Shared Integrated Management Information Systems (SIMIS)/ Information and Communication Technology (ICT)	The SIMIS/ICT provides hardware, software, and support services for integration of practice management systems among federally supported health centers (SIMIS), and integration of electronic health records with practice management systems at consolidated health centers (ICT).
HRSA	Integrated Services Development Initiative (ISDI)	The program supports integration efforts in five areas one of which is information management.
HRSA	Healthy Communities Access Program (HCAP)	The HCAP is a community-based program to develop or strengthen health care safety net delivery systems through providing an infrastructure that will coordinate health care for the uninsured. Development of information systems is fundamental to supporting coordination of efforts that increase access to care.
HRSA	Sentinel Centers Network (SCN)	The SCN is investing in the information systems of participant health centers and networks to provide timely, patient-level data to inform policy decisions and quality improvement activities across all health centers.
HRSA	Patient Electronic Care System (PECS)	The PECS is a program that is developing patient registry information systems for centers participating in the Health Disparities Collaboratives.
HRSA	Office for the Advancement of Telehealth grants (OAT)	Grants support for community-based activities in informatics, electronic medical records, and telemedicine, including telepharmacy.
HRSA	CAREWare	CAREWare is a patient, encounter-level software application distributed to HIV/Aids Bureau (HAB) grantees and providers of HIV care to help them manage, monitor, and report on all clinical and supportive care services. The software was originally built in Microsoft Access, but is now being developed in dotNET to enable Internet and wide-area connectivity of care providers and grantees. CAREWare is also being developed for use internationally (in Africa especially) under the President's Emergency Plan for AIDS Relief.
Centers for Disease Control and Prevention		
CDC	Public Health Information Network (PHIN)	The CDC is working to advance public health activities through standards-based information systems. These systems need to work with each other and with clinical care systems to support public health needs. Through PHIN, the CDC and its public and private partners have been advancing software components and data and technical specifications that are compatible with federal standards activities such as CHI, NCVHS, and eGov.
CDC	PHIN: National Electronic Disease Surveillance System (NEDSS)	NEDSS is an initiative that promotes the use of data and information system standards to advance the development of efficient, integrated, and interoperable surveillance systems at federal, state, and local levels.
CDC	PHIN: National HealthCare Safety Network System	PHIN is an Internet-based system to collect patient data on measures of health care quality.

Agency/ Organization	Title of HIT Initiative	Description of Activities
CDC	Public Health Monitoring	Most pubic health surveillance and monitoring systems, either directly or indirectly, get some data from clinical care activities. These data are used to facilitate public health surveillance through the timely and efficient transfer and processing of appropriate public health, laboratory, and clinical care data. Vital statistics systems also at times get data that originate in other places in the health system.
CDC	Clinically Oriented National Center for Health Care Statistics (NCHS) Monitoring	National Health Care surveys provide a picture of how health care is delivered in the U.S. by collecting data from hospitals, emergency and outpatient departments, ambulatory surgery centers, nursing homes, office-based physicians, home health agencies, hospices, and others on a periodic basis. These surveys address measurement of diagnosis and treatment, characteristics of health care providers, trends in use of services, characteristics of patients, patterns of disease, use of drugs and other treatments, and emergence of alternative care sites.
CDC	Public Health Preparedness Systems	Preparedness activities such as early event detection, quantification of outbreak or event magnitude, localization of an event, investigation of event etiology, the management of possible cases, the laboratory confirmation of true cases, the tracing of communicable disease contacts, the administration of vaccines, prophylaxis, and isolation all potentially interact with clinical-care data and systems. The PHIN standards have been requirements of the CDC and HRSA preparedness supplements to help see that the over 2 billion in preparedness funds that have gone to state and local health departments and hospitals can meet these information exchange goals.
CDC	EPI-X	EPI-X is the CDC's Web-based communications solution for public health professionals. Through EPI-X, CDC officials, state and local health departments, poison control centers, and other public health professionals can access and share preliminary health surveillance information quickly and securely. Users can also be actively notified of breaking health events as they occur. Key features of EPI-X include scientific and editorial support, controlled user access, digital credentials and authentication, rapid outbreak reporting, peer-to-peer consultation, and CDC-assisted coordination of investigations.
Department of Defense / Veterans Affairs Initiatives		
DoD/VA	Joint Plan for the Electronic Health Record (JPEHR)	The JPEHR will provide interoperability between the two health information systems of VA and DoD. The plan provides for the exchange of health data by the departments and development of a health information infrastructure and architecture supported by common data, communications, security, and software standards and high-performance health information systems. The plan will support Healthy People (federal), Federal Health Information Exchange (FHIE), Clinical Data Repository/Health Data Repository (CHDR), Consolidated Mail Outpatient Pharmacy (CMOP), Lab Data Sharing and Interoperability (LDSI), and the Centralized Credentials Quality Assurance System (CCQAS)/VetPro, Scheduling, and E-portal Systems. (Joint DoD and VA funding.)

Agency/ Organization	Title of HIT Initiative	Description of Activities
DoD/VA	Telehealth	Development and adoption of telehealth capabilities within the DoD Military Health System (MHS) and the VA continues to advance. The steady increase in cooperation between the two agencies allows for further leveraging of assets, knowledge, and development of integrated or interoperable programs. There are six joint telehealth initiatives in progress: VA/DoD Imaging Subgroup, Teleradiology, Telepsychiatry, Hawaii Integrated Federal Health Care Partnership, Alaska Federal Health Care Access Network, Case Management (Diabetes), and e-Learning.
Department of Defense Initiatives		
DoD	Clinical Information Technology Program Office (CITPO)	CITPO is an acquisition office for centrally managed MHS clinical IT systems that support the delivery of health services throughout the MHS. The following are CITPO projects: Composite Health Care System II (CHCSII), Composite Health Care System Legacy, Clinical Information System (CIS), Preventive Health Care Application (PHCA), Defense Blood Standard System (DBSS), Defense Occupational and Environmental Health Readiness System (DOEHRS), Encoder Grouper (EG), Special Needs Program Management Information System (SNPMIS), TRICARE Online (TOL), Nutrition Management Information System (NMIS), and Veterinary Services Information Management System (VSIMS).
DoD	Defense Medical Logistics Standard Support (DMLSS)	DMLSS replaces aging military departments' (Army, Navy, and Air Force MilDeps) specific legacy medical logistics systems with one standard DoD medical logistics system. DMLSS also manages Joint Medical Asset Repository (JMAR), Customer Support on the Web (CSW), Facility Management (FM), Customer Area Inventory Management (CAIM), Equipment & Technology Management (E&TM), Stockroom/Readiness Inventory Management (SRIM), Assemblage Management (AM), Universal Data Repository (UDR), Prime Vendor Program (PV), DMLSS - Wholesale (DMLSS - W), Customer Demand Management Information Application (CDMIA), National Mail Order Pharmacy (NMOP), Readiness Application (RMA), Medical Electronic Customer Assistance (MECA), Distribution and Pricing (DAPA) Management System (MS), and Electronic Catalog (ECAT).

Agency/ Organization	Title of HIT Initiative	Description of Activities
DoD	Executive Information/Decision Support (EI/DS)	The EI/DS program provides timely, accurate, and appropriate decision information supporting the TRICARE Management Activity (TMA) and DoD MHS mission. The EI/DS program currently consists of a data warehouse and several operational data marts supporting nearly 3,000 system users, providing a robust database and suite of decision support tools to empower the effective management of MHS health care operations. The EI/DS systems support decision making by senior MHS personnel and post-decision monitoring of the effects of decisions. EI/DS products include: MHS Management Analysis and Reporting Tool (MHS MART), Managed Care Forecasting and Analysis System (MCFAS), Population Health Operational Tracking and Optimization (PHOTO), Medical Surveillance, TMA Reporting Tools (TMART), CHAMPUS/TRICARE Medical Information System (CMIS), CHAMPUS/TRICARE Utilization Reporting and Evaluation Systems (CURES), Care Detail Information System (CDIS), and Patient Encounter Processing and Reporting (PEPR).
DoD	Resources Information Technology Program Office (RITPO)	The RITPO initiative is a project that consists of a family of capability-specific applications/systems that support the MHS "Manage the Business" and "Access to Care" and information technology requirements. The RITPO project scope includes providing information technology support for MHS personnel, scheduling, workload forecasting, and patient safety initiatives. The following are RITPO projects: Defense Medical Human Resources System - internet (DMHRS*i*), Central Credentials Quality Assurance System (CCQAS), Enterprise Wide Scheduling and Registration (EWS-R), Enterprise Wide Workload Forecasting (EWF), Patient Safety Reporting (PSR), and Patient Accounting System (PAS).
DoD	Expense Assignment System IV (EAS IV)	EAS IV is a standard DoD cost accounting/assignment information technology system that consists of a cost-assignment application and a data repository. The system receives information electronically from a variety of DoD financial, manpower, and workload systems, and allocates this expense information to Medical Treatment Facility/Dental Treatment Facility (MTF/DTF) direct and indirect work centers.

Agency/ Organization	Title of HIT Initiative	Description of Activities
DoD	Theater Medical Information Program (TMIP)	TMIP provides a seamless, interoperable medical information system to support theater health services during combat or contingency operations within and across all echelons of care. The primary goal is to provide a global capability linking theater medical information databases and integration centers that are accessible to the warfighter anywhere, any time to support the mission. TMIP includes the following programs: Composite Health Care System in the Theater of Operations (CHCS NT), Composite Health Care System II - Theater (CHCS II-T), TRANSCOM Regulating and Command and Control Evacuation System (TRAC2ES), Defense Medical Logistics Standard Support Assemblage Management (DMLSS-AM), Medical Analysis Tool (MAT), Shipboard Non-Tactical Automated Data Processing Program Automated Medical System (SAMS), Medical Surveillance System (MSS), and Defense Blood Standard System (DBSS).
DoD	Third Party Outpatient Collection System (TPOCS)	TPOCS is the MHS information system used to bill for ambulatory services.
DoD	Telehealth	The use of electronic information and telecommunications technologies to provide or support clinical health care, patient and professional health-related education, public health and health administration when distance separates the participants. Current projects include Business cases, e-Learning, Policy, Teleconsultation, Pediatric Consultation, Telecardiology, Teledermatology, TeleENT, Tele Mental Health, Teleneurosurgery, Teleorthopedics, Telepathology, Teleradiology, Telementoring, and Telemonitoring.
Department of Veterans Affairs Initiatives		
VA	Joint [VA/DoD] Patient Electronic Health Record (JPEHR)	The JPEHR plan will provide interoperability between the two health information systems of VA and DoD. The plan provides for the exchange of health data by the departments and development of a health information infrastructure and architecture supported by common data, communications, security and software standards, and high-performance health information systems. (See FHIE.)
VA	Allocation Resource Center (ARC) (Health Resources Management)*	The ARC provides IT services for systems designed to support the VHA CFO's ability to develop, implement, and maintain resource allocation methodologies; gather and report on financial aspects of patient workload and cost; classify patients based on care and diagnosis rendered; and train and provide information to management officials throughout VA.
VA	Decision Support System (DSS)*	The DSS transforms day-to-day operational data into tactical information that can be used by managers to make informed operational decisions.
VA	Decision Support System (DSS) Modernization*	The DSS will modernize the existing VA DSS information technology system through analysis, identification, development, and implementation of system architecture that interfaces with current and future VA-wide system information technology structures.

Agency/ Organization	Title of HIT Initiative	Description of Activities
VA	Fee Basis Replacement (FBR)*	The FBR will replace a claims-processing system used by VA that processes claims made by veterans and providers for non-VA care. The new system will ensure effective and efficient authorization and payment processing for all non-VA care, including state and home health care and community nursing home programs.
VA	Health Administration Center (HAC) IT Operations*	The HAC provides a variety of critical programs mandated by Congress and facilitates delivery of high-quality services to veterans and their family members.
VA	Patient Financial Services System (PFSS)*	The PFSS will create a comprehensive business solution for revenue improvement utilizing improved business practices, commercial software, and enhanced VA clinical applications.
VA	Health Enrollment	Health Enrollment includes functionality to accept and process veterans' applications for enrollment, share veterans' eligibility and enrollment data with all VA health care facilities involved in veterans' care, manage veterans' enrollment correspondence and telephone inquiries, and support national reporting and analysis of enrollment data.
VA	Federal Health Information Exchange (FHIE)	Provides current and historical data feeds electronically from CHCS I to the FHIE repository node on selected data types for active-duty, retired, and separated service members.
VA	Health Data Repository (HDR)	Defined as a repository of clinical information normally residing on one or more independent platforms for use by clinicians and other personnel in support of patient-centric care.
VA	Pharmacy Reengineering and IT Support	Facilitates improved VA pharmacy operations, customer service, and patient safety, concurrent with pursuit of full re-engineering of VA pharmacy applications.
VA	Scheduling Replacement	Will develop a next-generation appointment application based on business process re-engineering and the Institute for Health Care Improvement guidelines for open and advanced access to care models.
VA	VistA Imaging	Will provide complete online patient data to health care providers, increase clinician productivity, facilitate medical decision making, and improve quality of care.
VA	VistA Laboratory IS System Reengineering	Will enhance the VA Laboratory Service's information technology system and associated business processes to address current deficiencies and meet future needs.
VA	VistA Legacy (includes staff)	The operating system software platform and technical infrastructure (associated with clinical operations) on which VA health care facilities operate their software applications.
VA	Health Infrastructure	The health infrastructure is primarily a hardware-refresh project designed to put VA general office automation support servers, workstations, and peripherals on a 4-year replacement schedule. It will consolidate the services of several smaller computer facilities into an existing larger computer facility on newer hardware, providing greater reliability while reducing overall computer space and IT staff. It will establish a working contingency plan for the consolidated site.

* Administrative, logistic, and financial systems, which use health data but do not contribute to direct patient care.