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The Honorable Bob Stump  
Chairman, Committee on Armed Services  
House of Representatives  
Washington, DC 20515-6035

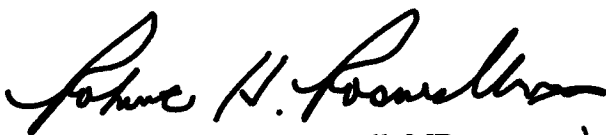
Dear Mr. Chairman:

I am pleased to forward this report in response to Section 724 of the National Defense Authorization Act for Fiscal Year 2000 regarding Telemedicine. Section 724 directed the Department of Defense (DoD) and Department of Veterans Affairs (VA) to submit a joint report evaluating joint telemedicine demonstration projects, including a description of each project and an evaluation of the feasibility and practicability of using telecommunications to provide health care services and pharmacy services, including the provision of such services to field hospitals of the Armed Forces and to VA outpatient health care clinics.

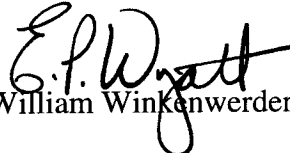
The DoD recognizes the importance of these joint telemedicine initiatives. We look forward to continued collaboration with the VA and other federal agencies to expand the use of telemedicine technology in support of delivering high quality health care to our service members, their families and our nation's veterans.

Thank you for your continued support of the Military Health System.

Sincerely,



Robert H. Roswell, MD



William Winkenwerder, Jr., MD

cc:

Representative Skelton

# **Report on Telemedicine**

**Required By:**

**Section 724**

**National Defense Authorization Act**

**For Fiscal Year 2000**

# **Report on Telemedicine**

## **Overview**

This report is the joint response of the Department of Defense (DoD) and the Department of Veterans Affairs (VA) to Section 724 of the National Defense Authorization Act for Fiscal Year (FY) 2000 (hereafter called the Act). This Act requires DoD and VA submit an evaluation report of their joint telemedicine demonstration projects. A report that includes the following components:

1. A description of each project.
2. An evaluation of the feasibility and practicability of using telecommunications to provide health care services and pharmacy services
3. The provision of such services to field hospitals of the Armed Forces and VA outpatient health care clinics.

## **DoD Telemedicine Strategic Working Group**

In July 2001, the DoD formed a Telemedicine Strategic Working Group (TSWG) that represents both DoD and VA telemedicine interests. The rationale for the TSWG was to coordinate telemedicine activities between the services and to link with the Telemedicine Strategic Healthcare Group in VA that has a similar coordinating function for telemedicine activities across VA. The TSWG was chartered to establish:

- Interagency goals and objectives for telemedicine
- Policy guidance, and develop oversight requirements and metrics to monitor the progress and outcomes of telemedicine development

The TSWG has initially focused its attention on identifying issues that hinder the appropriate and cost-effective use of telemedicine between the services and across agencies and also consider the impact this has on the transfer of this technology to the civilian sector. Issues meeting these criteria that have been addressed so far include:

- Coding and reimbursement
- Workload credit
- Credentialing and privileging
- Human resources
- Technical challenges
- Functional and interoperability considerations

The TSWG has collaborated with the American Telemedicine Association and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in assisting with the revision of JCAHO's 2000 credentialing and privileging standards for telemedicine. It is anticipated that these revised standards will be released in the spring of 2003 and adopted in early 2004.

### **Joint Demonstration Projects**

The TSWG has identified five joint telemedicine demonstration projects to report upon under the Act. These five initiatives provide illustrative examples of how DoD and VA are leveraging their use of telemedicine to improve the health services provided to their beneficiaries and indicate the feasibility of transferring such technologies to the civilian sector. These projects demonstrate how telemedicine can improve the quality and access of beneficiaries from both DoD and VA to health care services.

#### ***The Joslin Diabetes Center Diabetes Detection, Care and Treatment Project***

Since 1998, the DoD, VA and the Joslin Diabetes Center, of Boston, MA, have collaborated in a unique telemedicine initiative that delivers excellence in the detection, care, and treatment of diabetic patients. The objective of these programs is to transfer the clinical and academic expertise from the Joslin Diabetes Center to enhance the routine care management of diabetic patients in the VA/DoD health care environments.

This project is moving forward as 2 inter-related initiatives, the detection of diabetic retinopathy and patient education/self management of diabetes. In the first initiative, the *Joslin Vision Network (JVN)*, uses telemedicine to facilitate the detection and diagnosis of diabetic retinopathy. The second initiative, *Comprehensive Diabetics Management Program (CDMP)* is a web-based clinical tool embracing six components of the comprehensive management and care of patients with diabetes.

Joslin Vision Network (JVN): The goal of this DoD/VA project is to validate and demonstrate the JVN technology and methodology in the VA/DoD primary care settings and establish how it can improve one or more of the following aspects of clinical care: access to eye care; detection and treatment of diabetic retinopathy; cost/efficiency of care; and patient/provider satisfaction. Outcome measures being assessed in this project include:

- Improvements in the quality of patient care
- Increased access to care
- Reductions in the cost of care.

The JVN telemedicine initiative provides a technology platform that facilitates the diagnosis, management and treatment of diabetic eye disease (diabetic retinopathy). The initiative is designed to ensure that patients from different cultures who have diabetes have access into a cost-effective and quality eye-care program, access that is not limited by geographic boundaries.

The JVN system is currently deployed in a total of eighteen VA and DoD locations. Diabetic patients' digital retinal images taken at one DoD acquisition site (Elmendorf US Air Force Base Medical Center, Anchorage, AK) and one VA acquisition site (VAMC Togus, ME) are reviewed by the JVN reading center at the Joslin Diabetes Center (JDC). Images taken at the 16 other DoD/VA acquisition sites (Tripler Army Medical Center (TAMC), Honolulu, HI; Walter Reed Army Medical Center (WRAMC), Washington, DC; Army Hospital Ft. Meade, MD; Army Hospital Ft. Belvoir, VA; Army Clinic, Fairfax, VA; VAMC Honolulu, HI; VA Community Based Outpatient Clinic (CBOC) Maui, HI; VA CBOC Hilo, HI; VAMC Seattle, WA; VAMC Walla Walla, WA; VA CBOC Anchorage, AK; VA CBOC Tricities, WA; VA CBOC Yakima, WA; VA CBOC Billings, MT) are reviewed by the one of eight corresponding DoD or VA image review sites: TAMC; WRAMC; Army Hospital Ft. Meade, MD; Army Hospital Ft. Belvoir, VA; VA Medical Center, Honolulu, HI; VA Medical Center, Jamaica Plain, MA; VA Medical Center Seattle, WA; VA Medical Center Walla Walla, WA. The JVN reading center also conducts periodic quality assurance of all VA and DoD sites to ensure the required clinical and technical performance standards for the services are fully met and maintained. To date, 9,119 patients have received eye care via this program.

Data from the JVN clinical studies have demonstrated that the access of diabetic patients to eye care is increased using this program and that these patients have higher compliance with subsequent eye examinations. A VA study that evaluated patients treated in this program suggests that the low light level digital retinal imaging technology used in the JVN program, equipment that requires no routine pupil dilation, is one of the reasons why patients are more compliant with eye care recommendations.

Research has shown that the JVN system is equivalent to the National Eye Institute's Early Treatment of Diabetic Retinopathy Study (ETDRS), a clinically accepted "gold standard".

Comprehensive Diabetes Management Program (CDMP): The CDMP represents a collaboration of diabetes expertise from DOD, VA, the Indian Health

Services, the Centers for Disease Control, and the Joslin Diabetes Center. Partial program support for CDMP comes from DoD through the Telemedicine and Advanced Technology Research Center (TATRC) and represents an evolution of the Joslin Vision Network Eye Health Care model for diabetic patients towards a comprehensive program that addresses *all* aspects of diabetes care.

CDMP uses available web technologies to develop a one-stop, customizable, non-proprietary clinical tool that has been designed to embrace the various components necessary for an optimal comprehensive care management system for diabetes. These components include:

- Redesign of delivery system
- Clinical decision support
- Clinical information systems

The primary users of CDMP are care managers who facilitate interactions between patients and members of the diabetes care team, including physicians, nurses, educators, exercise physiologists, nutritionists, and behavioral clinicians. The program's expectation is that a model covering the continuum-of-care model can be implemented. This model would foster productive interactions between patients taking active part in their care and a variety of providers backed up by the resources and expertise of experts.

Preliminary data suggests that the core reason for the effectiveness of CDMP is its ability to empower the patient. Using CDMP support, patients become informed, proactive self-managers of their diabetes. Access to CDMP provides them with an ongoing set of information resources and competencies that minimizes the complications, symptoms and disability they incur from having diabetes.

The platform on which CDMP has been developed allows for the customization of CDMP modules and the seamless inter-communication of these modules in connecting with the host Hospital Information Systems. CDMP interfaces with a health organization's electronic medical records in a way that addresses relevant privacy and confidentiality issues involving the medical records of clients. Initial system features and tools include:

- Clinical risk assessment engine based on subspecialty diagnoses such as heart disease or eye complications
- Risk assessment algorithm, based on established diabetes management guidelines
- Alert system, based on color coded indicators
- Clinical assessment snapshot

- Notification and communications tools
- Behavior/self-management assessment tool
- Education tracking tool providing site users specific multi-level educational resources
- Knowledge assessment tool evaluating educational intervention impact
- Dynamic care planning

Additionally planned features include:

- Nutrition assessment and advisory module
- A “patient portal” that provides internet access to allow reporting of various self-test information, any patient perceived problems and the down loading of test results

It is intended that the CDMP will undergo rigorous clinical testing and clinical trials will take place at sites already participating in the JVN program. Beta testing is scheduled to begin during the first quarter of 2003. An outcome assessment module will be used to quantify the effectiveness of the CDMP interventions and clinically validate the various embedded patient assessment tools.

### *Adult Nurse Practitioner Post Master's Program*

This project provides distance learning for nurse practitioner training and has a defined educational curriculum. It is a collaborative effort between the VA Office of Nursing Services and the Uniformed Services University for the Health Sciences (USUHS) Graduate School of Nursing in Bethesda, MD. The project has demonstrated that a geographical separation of students and teachers can be bridged using electronic communication technologies and result in a comprehensive and effective educational experience for both.

The major benefit of the program is that it provides a solution to the challenge of increasing the availability of primary care providers in VA facilities. The Office of Nursing Services in VA proposed this alternative as a way for currently employed, masters-prepared nurses to obtain new knowledge and skills as nurse practitioners. This innovative program has shown that it is possible to capitalize on the benefits of new communication technologies to offer a unique approach to nurse practitioner education via distance learning. The VA Office of Nursing Services and DoD's USUHS Graduate School of Nursing jointly undertook the design and implementation of this program.

This project rolled-out in two-phases: Phase I consisted of a preliminary course that tested the project's feasibility. Following the success of Phase I, Phase II contained the remainder of the curriculum. When the VA/DoD Distance Learning Nurse Practitioner curriculum was designed, providing the requisite course work via distance learning had never been done. Existing distance learning programs for nurses required students to spend several weeks each summer at the host campus to complete their clinical practicum. Such a requirement would have significantly increased program costs and made it difficult for many nurses working full time to attend.

The VA and DoD partners in this program worked with USUHS to develop the necessary curriculum components to transition clinical nurse specialists into the role of adult nurse practitioners using distance-learning techniques. The Adult Nurse Practitioner Post-Master Program focused on VA's need to meet adult health care needs. After completing the program, graduates are prepared to take the appropriate national certification examination in their nursing specialty. This program is a cost-effective way to improve care delivery. It has improved the morale of a cadre of long-term and loyal staff by giving them new competencies acquired using this innovative method of re-education and re-training.



All the participants have played an important role in the success of this telemedicine collaborative. USUHS designed and administered the program, including establishing the curriculum, admitting students, providing qualified faculty, and procuring additional resources. The VA supported the program nationally by:

- Providing access to its national telecommunication network for this distance learning program
- Setting up the distance learning sites at VA medical centers
- Submitting candidates to USUHS for evaluation of academic requirements
- Providing local resources for students
- Offering on-site coordination with Graduate Schools of Nursing
- Partial funding for the project.

In addition, each of the VA medical centers that became a distance-learning site provided:

- An educational coordinator to administer the program
- A masters degree-prepared nurse practitioner preceptor to arrange and supervise the clinical aspects of the program.

Courses were scheduled for after working hours twice a week for two hours, with a third hour conducted as a laboratory activity by the lead preceptor at each VA site. These courses were designed to parallel the on-campus USUHS courses.

The first phase of the project was a Pilot Project Test Class conducted at the VA medical centers in Atlanta, GA and Fayetteville, NC and included a total of 11 students. The pilot test class was designed to evaluate technical capabilities and teaching strategies and to identify the most successful technological media that could be transmitted using video teleconferencing techniques. The preceptors at each site conducted health assessment laboratories, demonstrated "hands-on" technical skills, and supervised basic clinical experiences. Video reception at the pilot sites was assessed as part of the USUSH evaluation of the students' comprehension of the didactic course components.

The evaluation showed no difference in the competencies and skills of the students being educated by distance learning compared to students in traditional campus-based nurse practitioner programs. The joint DoD/VA and USUSH evaluation of Phase I included major input from the students. Student feedback on both the course content (flow, depth, and relevance) and the technology (audio, video, and transmission) was clearly positive. All parties concluded that the Distance Learning Pilot Class Project was a success.

Following the success of Phase I, implementation of the Adult Nurse Practitioner Post-Master Program (also known as the VA/DoD Distance Learning Program) began. It provided education or training courses at remote (off-campus) locations via audio, video or computer technologies at VA medical centers in the continental United States, Puerto Rico and the Virgin Islands. A key DoD role in this partnership was to reinforce the academic strength of the new program and also to develop evaluation tools to monitor the teaching program/curriculum to ensure that all the required standards of certification were fully met.

Since implementation of Phase II, sixty students have graduated from the program. This service model has now been taken-up by another government agency, National Institute of Mental Health, to expand its educational outreach program.

In creating this new program that utilizes state-of-the-art technologies the project coordinators overcame numerous challenges. Encouraged by this success, the USUSH and VA departments, faculty, staff, and students are continuing to improve the content and delivery of these distance-learning courses.

The beneficiaries of both agencies have greatly benefited from the success of this telemedicine initiative. Maintaining a corps of health care providers who are highly trained to a common and advanced curriculum is a valuable asset in helping DoD/VA provide life-long health care to those who serve our nation in the uniformed services. This collaborative training and education program enhances interagency coordination. It is a mission ready resource for times when the VA is called upon to provide backup medical care to DoD beneficiaries in response to a national emergency.

The lessons learned from this telemedicine demonstration project are being used as DoD and VA are exploring the feasibility of other initiatives involving distance learning.

## *Alaska Federal Health Care Access Network (AFHCAN)*

The Alaska Federal Health Care Access Network (AFHCAN) is a joint initiative of the VA, DoD, Indian Health Service, US Coast Guard and other state and federal agencies. The goal of the AFHCAN was to improve access to health care for over 200,000 federal beneficiaries in Alaska through introducing sustainable telehealth systems. AFHCAN was designed to be a “system” to support existing referral patterns throughout the federal health care system in Alaska. Most of the 235 federal and state sites in Alaska are now joined in a dedicated statewide telehealth network with an emphasis on the transmission of telehealth cases, teleradiology, videoconferencing, and other health related data and voice communications. Using state-of-the-art technology and equipment, member organizations now send medical images, health information, and voice data to regional hospitals for remote diagnosis and consulting.

The AFHCAN project demonstrates the effective and feasible use of telecommunications for the delivery of healthcare services across a geographically disperse and climatically challenging environment. During the past 12 months of the project alone, approximately 3000 store-and-forward telemedicine cases were completed. Most of these cases were consultations requested by community health aides to physicians using various tools along with the AFHCAN-developed telemedicine software to create and send the information to the referral provider. In one region, the application of telemedicine through the AFHCAN helped decrease waiting times to see ear, nose and throat specialists by providing images and data in a more timely fashion.

AFHCAN uses web-based software that is continually evolving to offer major performance improvements and added features. It is addressing the interoperability issues that face many telemedicine projects by allowing servers and nodes to communicate.

The AFHCAN project is now transitioning toward a sustainable program. Transition activities planned include elements that support a solid technical, functional, and business basis for the network that will greatly expand the capacity and utility of telehealth in this regional area. This includes continuing:

- The development of technical architectural standards to allow secure expansion of the AFHCAN network to non-AFHCAN sites and other health care networks

- The exploration of joint project/partnership/business models
- Ongoing program development, such as dermatology, home health, dental and integration of partnership technologies.

The AFHCAN project supports investment in the benefits of telehealth and clearly represents a regional infrastructure project that demonstrates the technical feasibility and practicality of using telecommunications to deliver healthcare services over a wide and physically inaccessible geographical area.

## *Hawaii Integrated Federal Health Care Partnership*

In December 1999, the U.S. Army's Pacific Regional Medical Command, Tripler Army Medical Center (TAMC) and the Veterans Affairs Medical and Regional Office Center (VAMROC) signed a partnership agreement now known as the "Pacific Telehealth and Technology Hui." The Hui was established with congressional funding to leverage mutual strengths and improve the quality, accessibility, patient satisfaction, and cost effectiveness of health care services provided to beneficiaries through the use of emerging technologies including telehealth technologies. The work of the Hui therefore involves research, development, prototyping, evaluation and technology transfer. Since its inception, the Hui has facilitated joint exploration of the means to create and disseminate telehealth systems throughout the Pacific region.

The Hui manages numerous projects including clinical informatics and telehealth projects, data warehousing, and data systems communication. On the national level, as DoD continues with the implementation of Composite Health Care System II (CHCS II) and VA continues with the development of plans for HealthVet-VistA, the departments recognize the need to address interoperability. The primary objective of the DoD/VA Electronic Health Records Interoperability Initiative is to accomplish complete healthcare data systems interoperability, whereby data for patient records between DoD/VA are shared and complete on both hospital information systems, creating a unified view of the patient information. The long-term goal of the Hui echoes these efforts.

DoD/VA data interchange has had significant success. It allows TAMC providers to order prescriptions for VA patients in CHCS. To facilitate the process, a subset of the VA formulary was integrated into CHCS.

The Health Care System Data Interchange Project automated this pharmacy process, eliminating the potential for transcription error. This new automation process receives the ordering from the TAMC provider using CHCS and transmits the order, via a one-way interface, into VA's VistA allowing the VA pharmacist to fill and dispense the drug to the patient.

## ***Naval Hospital Great Lakes (NHGL)-North Chicago VA (NCVA) Pilot Teleradiology Project***

Using lessons learned from other DoD/VA collaborations, the two agencies are planning the NHGL/NCVA Pilot Teleradiology Project. This project will use teleradiology technology to enable sharing of radiology professional services between NHGL and the Veterans Integrated Service Network 12 (VISN 12). VISN 12 will act as the information technology gateway for the transfer of digital information between VA and DoD.

The first phase will provide the same day reading and report turn-around of low risk, low complexity routine chest x-rays taken as part of the Naval recruiting process. NHGL will utilize the VA's VistA system to order and process the request. Proposed workload is projected to be 15,000 reads annually. The second phase will include routine analyses using other, more complex diagnostic imaging modalities. The last phase would expand this pilot to include a contingency priority two-hour turn-around for priority or urgent after-hours diagnostic imaging services, such as clinical support for the emergency room during evenings and on weekends. Additionally, in the event of a shortage of clinical support at VISN-12, the NHGL images will be re-routed electronically to the Baltimore VA VISN for processing.

These NHGL reports and the images will be stored in the North Chicago VA PACS system until the NHGL establishes an archive capability for the images and reports. Meanwhile, the reports and the images will be available to the Navy providers via a web server that is compatible with the VistA system and accessible at the NHGL.

To facilitate implementation of this project, changes in the areas of reimbursement and credentialing/privileging will be necessary to accommodate beneficiaries with dual eligibility. Secure Internet connections are being defined, tested, and certified for end-to-end connectivity between both agency locations and across their respective secure networks. Timely and authorized NHGL provider access to patient images and the associated reports stored in the VA network are being coordinated and tested. A long-term goal should be to establish an automated interface between DoD and VA radiology imaging storage systems that will permit exchange of data almost instantly and minimize manual data entry and potential associated errors. Naval personnel have been trained on the VA's system for data entry and report retrieval.

## **Summary and Conclusions**

The DoD/VA have both made tremendous progress in demonstrating the feasibility of using telehealth and telemedicine applications to further enhance services provided to their respective beneficiaries. The valuable lessons learned from these demonstration projects indicate the feasibility and practicality of using telecommunications for the provision of health care services to field hospitals of the Armed Forces and to VA outpatient health care clinics. Such collaborations will continue consistent with validated and prioritized joint operational medical mission requirements. DoD's Telemedicine Strategic Working Group and VA's Telemedicine Strategic Healthcare Group has begun the processes of centralizing the necessary coordination on these initiatives in both agencies. Issues requiring senior-level oversight will be escalated to VA/DoD Health Executive Council (HEC) co-chaired by the Assistant Secretary of Defense (Health Affairs) and the VA Under Secretary for Health. For example, the working group will propose business process reengineering changes to the HEC for consideration. Information technology will be used as a supporting tool to meet approved mission requirements.