

**United States Department of Commerce  
NIST Health Informatics Infrastructure**

*NIST research is contributing to the President's goals of having electronic health records for most Americans, as well as a nationwide health information network, by 2014, which will improve quality and accessibility and reduce costs of healthcare for older Americans.*

**Lead Agency:**

National Institute of Standards and Technology (NIST)

**Agency Mission:**

To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

**Principal Investigator:**

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**Partner agency:**

Department of Health and Human Services  
American Telemedicine Association  
Center for Aging Services Technologies  
Healthcare Information Technology Standards Panel  
Certification Commission for Healthcare Information Technology  
Integrating the Healthcare Enterprise  
Continua, among others

**General Description:**

The National Institute of Standards and Technology (NIST) has a long and effective history for contributing to the technical direction of health IT, which has potential to improve the quality and accessibility of healthcare for older Americans, while reducing costs. Activities include supporting the efforts of the Department of Health and Human Services Office of the National Coordinator for Health IT and collaborations with a host of other public and private organizations including the American Telemedicine Association (ATA) and the Center for Aging Services Technologies (CAST). NIST's laboratories are contributing to this research and to the healthcare industry by providing standards, measurement science, security technology, and testing expertise. NIST collaborates with

major standards development organizations, professional societies, and the public sector in fostering secure, interoperable, standards-based solutions for the exchange of health information. NIST focuses on advancing healthcare information standards that are complete and testable, and by providing the necessary conformance tests, interoperability tools, and techniques where appropriate. These activities, when integrated into standards, software, and certification processes, raise the quality of the clinical outcomes, lower cost of health IT implementation, and foster adoption of healthcare systems.

***Excellence:*** What makes this project exceptional?

***Significance:*** How is this research relevant to older persons, populations, and/or an aging society?

***Effectiveness:*** What is the impact and/or application of this research to older persons?

***Innovativeness:*** Why is this research exciting or newsworthy?

This project is exceptional in that it brings together key government departments and agencies such as those listed in section I, response 5, to fulfill the President's Executive Order, Number 13335, which calls for most Americans having electronic health records and for our country to have a nationwide health information network by 2014. Each public and private entity brings its expertise to contribute to the goal.

This research is relevant to all Americans, but of particular importance to our aging society. People are living longer, and the demographic tidal wave will swell the ranks of the elderly in America from approximately 12.5 today to 18.8 percent in 2025, a 50 percent increase. By 2030, the proportion of the U.S. population 65 years old or greater will double to 71 million. By 2030, healthcare spending will increase 25 percent, largely due to an aging population. Unfortunately, also, chronic conditions disproportionately affect older adults, thus consuming a greater proportion of healthcare resources. About 80 percent of older adults have at least one chronic condition; at least 50 percent of older adults have at least two chronic conditions.

The impact and/or application of this research is that it will include applications of connected technologies that are possible, practical, and affordable. It has potential to improve the quality of healthcare that our aging populations needs and deserves, for example, having test results available when and where they are needed. It will also improve accessibility, for example, through telemedicine, allowing seniors to communicate with their healthcare providers remotely without costly and time-consuming (and potentially difficult) trips to the clinicians' offices. In addition, it can reduce costs through, for example, minimizing duplicative tests, or providing collaborative systems including personalized sensors and software converging through wireless Internet capability to permit seniors to stay in their own homes longer. Not only can results of this research improve healthcare, but it can improve the quality of life and preserve independence for our aging population.

The research is exciting and newsworthy, because NIST has already been able to use its core competencies as articulated in our mission. Some of NIST's recent achievements in this area include:

- Developed software to advance the national goal of providing doctors secure and appropriate access to all patients' electronic health records, thereby enabling accurate diagnosis and treatment of disease. This software is used by U.S. regional healthcare systems (MA, NY, NC, Philadelphia) with over 40 vendors (IBM, GE Healthcare, Siemens, etc.) and is part of several national healthcare infrastructures (France, Denmark, Italy, Austria, Spain, China, and Japan). It is the basis of the Healthcare Information Technology Standards Panel's Manage Sharing of Document specification that was recognized by the Secretary of HHS (Dec. 2007).
- Developed test tools to validate healthcare messages sent between healthcare systems. These tools have been incorporated into testing for DICOM (radiology images), used by the Certification Commission for Health Information Technology (CCHIT) in testing interoperability of Electronic Health Record systems, and used by the Veterans Administration, Kaiser Permanente, Siemens, and IBM Healthcare & Life Science, among others.
- Authored the conformance strategy and model to specify electronic health record (EHR) functions critical to care settings and for certification of EHR systems.
- Collaborated with the American Telemedicine Association on practice guidelines. For example, the Practice Guidelines for Ocular Telehealth have been adopted by several major ocular health centers, including the Joslin Diabetes Center, Inoveon, and the Walter Reed Medical Center.
- With the Center for Aging Services Technologies, hosted a major national summit that brought together a diverse group of stakeholders to address the challenges and enabling technologies needed to reach the vision of a connected home environment for the aging population in which healthcare devices are interoperable with home and consumer appliances, providing the infrastructure for patient-centric healthcare and wellness.
- Leading the development of an integrated virtual system to test interoperability of standards-based health systems. This is expected to be used by the Healthcare Information Technology Standards Panel (HITSP), the Certification Commission for Healthcare Information Technology, and implementers of the HITSP specifications. This test bed offers developers of health information technology (health IT) systems the interactions necessary to develop conformant standards-based implementations, leading to optimal health IT systems.
- Working with the private sector to harmonize healthcare standards and to develop specifications to enable transmission of health information securely using standard cryptographic technologies.
- Working on tools and tests to assure medical device interoperability.

Cross Document sharing (XDS) Reference Implementation and Test Suite:

<http://ihewiki.wustl.edu/wiki/index.php/XDS> Main Page

IEEE Medical Device Test Tools: <http://xw2k.nist.gov/medicaldevices/index.html>

Information on the NIST/CAST National Summit on Moving Towards Interoperability: Affordable, Accessible Healthcare:

[http://www.nist.gov/public\\_affairs/techbeat/tb2006\\_0831.htm](http://www.nist.gov/public_affairs/techbeat/tb2006_0831.htm)

<http://www.itl.nist.gov/Healthcare%20Summit/index.htm>

NIST's role in this research area is recognized in reports such as the following:

*The ONC-Coordinated Federal Health IT Strategic Plan 2008 – 2012*, released June 2008.

*Achieving Electronic Connectivity in Healthcare*, Connecting for Health Collaborative, July 2004.

*Revolutionizing Health Care through Information Technology*, President's Information Technology Advisory Committee, June 2004.