Better Data, Better Health

That information technology is transforming healthcare is no surprise. The big news is how far the transformation has come already and why major changes are emerging now thanks to rapidly growing access to vast data sources, exciting new analytical tools and unprecedented levels of integration and convergence across the healthcare landscape. How big could these changes be? Consider what’s possible today or in the near future.

- Drawing on health information residing in public and private databases worldwide, researchers identify unexpected connections between health and behavior in a certain population. Public officials use the information to make life-saving policy decisions.
- Integrated health data from surveillance sensors and clinical reporting pinpoint the source and extent of a new infectious disease outbreak. Public health agencies have access to the information to assess its course and take effective action.
- Improved data systems enhance information exchange between patient Electronic Health Records (EHRs) and federal health benefits systems. Patients receive timely benefits. With improved information, government program managers lower costs and reduce fraud.
- Paperless clinical organizations and practices electronically capture, store, exchange, analyze and act on health data. Healthcare providers are an integral source of data in a national and global network of shared health information.

Northrop Grumman is at the forefront of technologies and solutions that will make scenarios like these possible. For 20 years, the company has been working to improve the health IT infrastructure. Northrop Grumman’s mix of health and IT specialists have developed software, networks, health websites and systems that have been integral to the health IT revolution. Long before IT proliferation, Internet ubiquity and the evolution of desktops, laptops, PDAs and iPads, these professionals were laying the groundwork that continues to remake healthcare.

Today, Northrop Grumman is a leading force in the networking, integration and analysis of massive health data sets. This capability is driving the convergence of nearly every area of health: public health, population health, financial and business systems, research and clinical care.

The implications stretch far and wide. Researchers, to use just one example, will have unprecedented capabilities for unlocking medical mysteries contained in health data. They will survey, capture, integrate and analyze data at scales never before possible. The creation of data repositories and distributed data that are safe, secure and private will afford healthcare researchers new opportunities to understand links between health and a host of factors, among them genes, lifestyle, the environment and gender. Similarly, researchers could discover previously hidden aspects of health and disease.
connections between disease, drugs and medical interventions. The upshot would be greater efficacy in disease prevention, better and earlier detection of health problems, and more effective treatments, including personalized drugs that are tailored to treat a patient based on the unique profile of chemical and biological actions within his or her cells.

A Resource for Healthcare Reform
Evolving and modernizing the country’s healthcare delivery system is a complex undertaking—and a challenging one. Healthcare has been slowly adopting information technology in a consistent and meaningful way across the nation. With healthcare reform now a priority, emphasizing efficiency in the delivery of care and a need to move faster is at the forefront of the healthcare system. IT is recognized as a key lever to reducing costs and raising quality in healthcare.

For example, Congress is providing support for billions of dollars in financial incentives to encourage providers to adopt EHRs. In addition, health information exchanges are being built to provide for the safe, secure transfer of health information across systems. Further, databases and analytic programs are being developed to better understand what works in healthcare, and new consumer applications are being created to empower patients to become more involved in promoting their health.

The enormity of the undertaking to reform healthcare—a sector that constitutes over a sixth of the country’s economy—can hardly be overstated. Nor can the imperative for innovation and reliable technical support be overemphasized. Meeting the demands and far-reaching scope of health reform requires the involvement of private-sector participants with sufficient capacity to build and maintain needed systems.

Broad-Based Health IT Experience
Northrop Grumman is one of the few Information Systems and Global Security companies that have the reach, expertise and experience—in systems engineering, systems integration, modernization, interoperability, security, surveillance systems and program management—to implement interoperable health IT solutions across a broad range of systems.

In the health IT arena, Northrop Grumman currently supports national systems that are already exploiting the potential of electronic health data. Those systems are improving delivery and efficiency of care and outcomes. Specifically, the work done by the Northrop Grumman Health IT team is advancing predictive modeling, analytics, mobile health, use of the cloud and virtualization in healthcare, national and international bio-surveillance, interoperability of health systems, and the safe and secure exchange of health data.

Northrop Grumman is making the connections required to leverage health data to the fullest. In the future, a person’s health data will be much more accessible—available on multiple devices at any time of day or night to the patient and authorized providers. Safety, privacy and security will continue to be integral to the system. And analytics will increase the value of data and information in improving health care knowledge and delivery. Health IT-enabled personalized medicine and telemedicine mean that patients will be more likely to receive high-quality care at all times, whether they see their hometown doctor for a routine appointment or require emergency surgery thousands of miles from home.

Many of the advances being pursued by Northrop Grumman fall into two main areas: health analytics and new healthcare models.

Health Analytics
The secure and safe collection of health information provides an unprecedented opportunity to better prevent, diagnose and treat disease. Since the time of Hippocrates, medical breakthroughs largely occurred at the intersections of insight, experience, data and technology: the development of common vaccines, advanced chemotherapy, and the development of radiation imaging and X-rays, among others.

Northrop Grumman is developing and facilitating:

- Large-scale data analysis and correlation of treatments with outcomes that are stratified by genetic data, medical history and other patient data to improve health outcomes.
- Widespread deployment of EHRs and analysis of EHR data that can enable improved treatment decisions on an unprecedented scale.
- Personalized medicine, including opportunities to develop patient-specific drugs and procedures that can improve health outcomes and drive down costs.

Health IT analytics can provide insights that at present are scarcely imaginable. Applications for large-scale data analysis are boundless. For example, analyzing large data sets can
significantly improve the identification and monitoring of disease outbreaks, whether from food-borne pathogens or communicable illnesses. Health IT analytics will also sharpen our understanding of environmental and lifestyle components of health and disease.

In the future, the lowered cost of mapping and storing a person’s genome will make it more feasible to include that data as part of a patient’s electronic medical record. A critical mass of such records will allow researchers to make stronger connections between specific genetic profiles, including genetic deviations, and corresponding diseases. Armed with that knowledge, doctors will be better equipped to identify and more effectively control diseases. Harnessing the power of genomics and proteomics (the study of proteins on a large scale), healthcare providers may eventually begin to prescribe personalized drugs designed for a person’s unique cellular makeup and metabolic function.

Of course, no analysis of health information technology and healthcare reform can exclude the reality of escalating costs. At a time of constrained budgets, unrestrained increases are unsustainable. Healthcare fraud drains billions of dollars from the system each year, driving up consumer costs by a commensurate amount. Fraud affects the healthcare system with higher costs and less healthy outcomes.

Northrop Grumman is a leader in supporting efforts to combat fraud in healthcare. It continues to refine and devise techniques for large-scale data mining and analysis to spot specific activities and trends that indicate potentially fraudulent behavior. It also leverages multi-level analytic solutions to accelerate fraud detection, and provides privacy-protecting interoperability among federal agencies.

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**New Healthcare Models**

Healthcare IT and health data are precision tools that will be used to help reduce inefficiencies from the healthcare system. Employing those tools on a large scale could lead to treatment and delivery alternatives that can help decrease healthcare costs. Advances by Northrop Grumman could lead to:

- Mobile health that is global and integrated, allowing for real-time diagnostics. The goal is a system that can work with all mobile devices to provide real-time communication of potentially life-saving health data.
- Altering the mix of medical staff that delivers care, leading to reduced costs. Technology can create safeguards, such as warnings about potential adverse drug interactions or the possibility of allergic reactions. Systems will provide expert data to practitioners to facilitate the transition to new systems.
- Shifting the payment/delivery model away from fee for service and toward a focus on high-quality care and fee-for-outcome models can improve health and reduce costs.
- Expansion of telehealth, such as real-time video engagement that can reduce costs and speed up delivery for common ailments. Telehealth will be most effective when integrated with EHRs as part of a 24/7 model of patient-centered care.

Advances in mobile health and the integration of mobile devices with larger systems are making round-the-clock monitoring possible. In the future, a person who falls ill may be able to receive medical attention without having to make a telephone call or having to rely on someone else to summon help.

In the future, health IT will likely push delivery of healthcare into the home. For example, the mother of a child who gets sick at night may not need to call a doctor and nervously await a reply or frantically spirit the child to an emergency room. Rather, she may be able to use electronic devices to transmit the child’s vital signs and images to an on-call healthcare provider, who could take appropriate action, such as sending an electronic prescription to the mother’s pharmacy.

Looked at from a wider angle, if the mother is eligible for Medicaid or veteran’s benefits, can information be securely shared with the appropriate benefits and financial systems? Are there public health implications? Can information be securely shared with public health databases? The connections and possibilities can go on and on.

It is clear that effectively leveraging health data will have dramatic results—on a scale that can help transform healthcare across the nation. Through focused and sustained efforts in the development of both health analytics and new healthcare models, Northrop Grumman is helping support this national evolution in healthcare. In so doing, Northrop Grumman is committed to advancing and leveraging health data in a way that is secure and safe for all.

As it has over the last two decades, Northrop Grumman will continue to be at the forefront of health IT, supporting its customers’ missions through innovative health systems and advanced analytics.

For more information, please visit [www.northropgrumman.com/healthit](http://www.northropgrumman.com/healthit)