



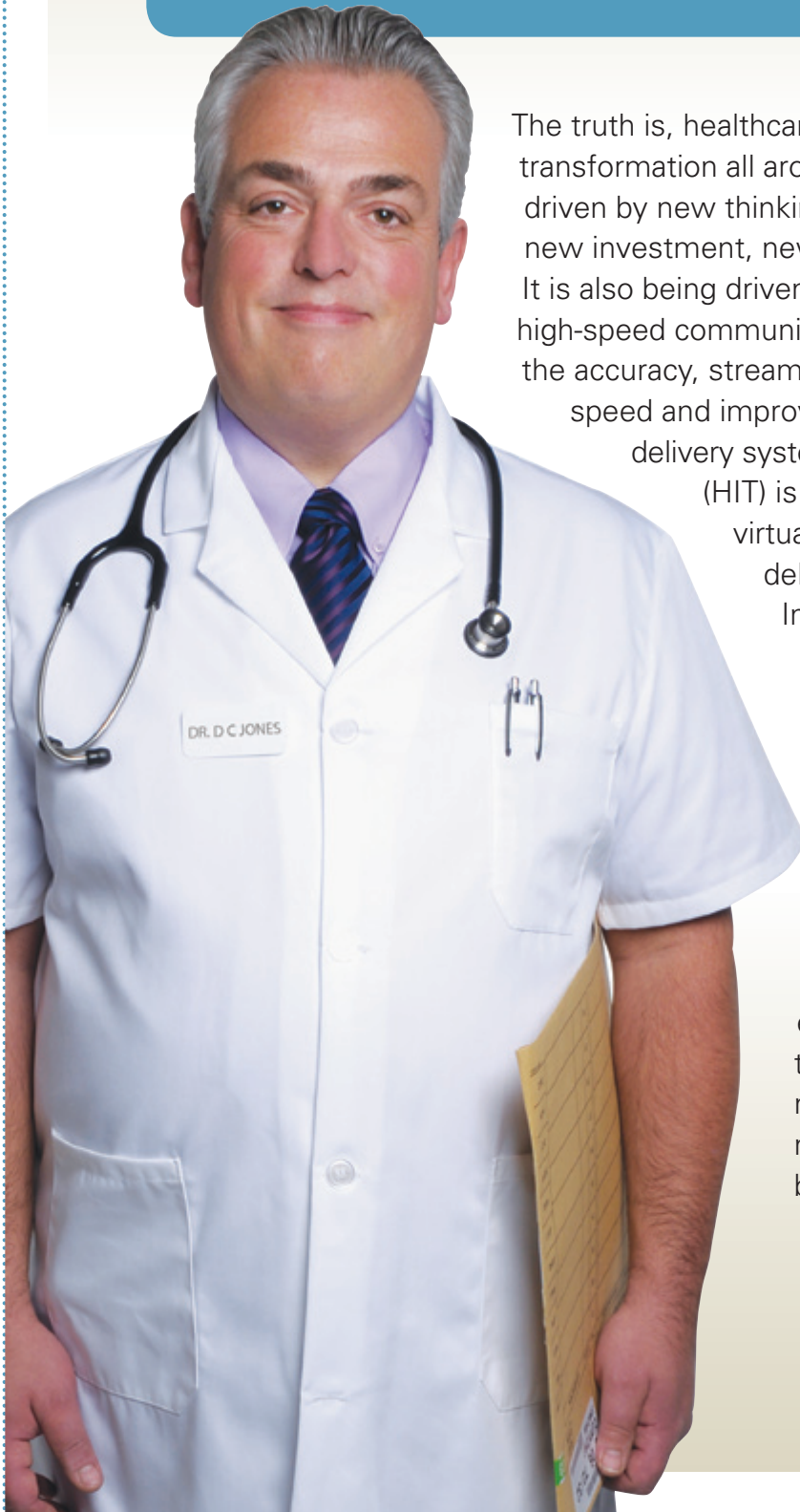
HIT: Moving Forward at Broadband Speed

Motorola's wireless broadband expertise and solutions are helping Health Information Technology (HIT) gain traction and momentum in the United States and worldwide



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To say the healthcare industry is in the midst of change would be a monumental understatement.



The truth is, healthcare is in the midst of a near-total transformation all around the globe. It's a transformation driven by new thinking, new demand, new legislation, new investment, new timelines and new expectations. It is also being driven by innovative ways of leveraging high-speed communications technology to transform the accuracy, streamline the efficiency, increase the speed and improve the effectiveness of healthcare delivery systems. Health Information Technology (HIT) is capable of dramatically improving virtually every aspect of healthcare delivery. But as Chief Medical Information Officers (CMIOs) and healthcare organizations develop HIT strategies and plans, they soon discover that issues such as interoperability, security, emerging standards, regulatory compliance and demonstrable return on investment often make HIT implementation a significant challenge. This paper examines how wireless broadband technology, a critical component of new HIT systems, can be implemented and utilized to yield critical benefits quickly and assuredly.

In regions around the globe, the health care industry is undergoing significant change as it fast-forwards efforts to reduce costs, increase efficiency and improve service and patient outcomes. Although the movement is global, tactics are not universal. The fact is, most countries are taking their own specific routes to achieving the desired results. Virtually all of them, however, are basing their efforts on one fundamental building block: today's advanced Health Information Technology, or HIT. Viewed by government, care delivery organizations and health care professionals as a crucial element of the new health care paradigm, HIT is being relied upon to play a transforming role in helping the health care industry prosper in the new century.

Playing "Catch-Up"

In the United States, HIT is gaining momentum in the wake of a prolonged period of industry under spending. In a February, 2009 report, research and consulting firm the Gartner Group describes the U.S. healthcare industry as "playing 'catch-up' after years of spending less on IT than other sectors." This lack of funding has led to relatively slow progress in the adoption of electronic health records (EHR) by U.S. physicians and hospitals. As defined by the U.S. government, these are "electronic records of health-related information on an individual that are created, gathered, managed and consulted by authorized health care clinicians and staff."

In its Health Blog, the *Wall Street Journal* reports that only 17 percent of U.S. doctors have EHR. And this is only the tip of the iceberg. The Blog further cites a second survey published by the *New England Journal of Medicine* that found "only about nine percent of U.S. hospitals have EHRs. And overall, only 1.5 percent of U.S. hospitals have adopted 'comprehensive' EHRs, i.e. those with a complete set of bells and whistles, installed throughout the hospital. Another 7.6 percent have basic systems installed

in at least part of the hospital." Further, the American Academy of Family Physicians estimates that although 42 percent of active family doctors have installed some type of EHR, about 80 percent of all U.S. doctors' practices are still largely paper-based.

A New Opportunity

The good news is that healthcare providers now have exceptional new opportunities to leverage HIT in addressing many of the most pressing healthcare business issues. What are these issues? HIT is playing an increasing role in improving access to quality service and care throughout the country, even in rural and remote locations. It is also helping to address current and prospective shortages of nurses and other healthcare personnel. And it is helping mitigate other major issues such as medical error, internal and external miscommunication and medical identity theft (see sidebar). What are the opportunities? In the U.S., the most significant is the American Recovery and Reinvestment Act (ARRA).

The Carrot: ARRA

ARRA, as the recently enacted U.S. economic stimulus package is called, provides some \$20 billion in healthcare technology funding. Funds are designated to help healthcare providers develop and implement robust IT infrastructures to deliver the benefits of HIT. Collectively labeled the HITECH (Health Information Technology for Economic and Clinical Health) Act, the legislation contains provisions designed to create and expand current healthcare IT infrastructure, promote electronic data exchange (EDI) and increase adoption of EHR by hospitals and physicians.

HITECH Healthcare Funding

Specific funding initiatives and incentives provided by the HITECH provisions of ARRA include¹:

Funding

- \$2 billion for the Office of the National Coordinator (ONC)
- \$20.819 billion in incentives through the Medicare and Medicaid reimbursement systems to assist providers in adopting EHRs
- \$4.7 billion for the National Telecommunications and Information Administration's Broadband Technology Opportunities Program
- \$2.5 billion for the U.S. Department of Agriculture's Distance Learning, Telemedicine, and Broadband Program
- \$1.5 billion for construction, renovation, and equipment for health centers through the Health Resources and Services Administration
- \$1.1 billion for comparative effectiveness research within the Agency for Healthcare Research and Quality (AHRQ), National Institutes of Health (NIH), and the Department of Health and Human Services (HHS)
- \$85 million for health IT, including telehealth services, within the Indian Health Service

¹ Healthcare Information and Management Systems Society (HIMSS)

HIT AND MEDICAL IDENTIFY THEFT

Medical identity theft is the stealing of patients' personal, financial and insurance information by inside or outside perpetrators. According to the National Healthcare Anti-Fraud Association, about three percent (or some \$60 billion) of U.S. healthcare costs can be attributed to this type of fraud. HIT systems that have powerful, leading-edge security technologies are helping to significantly reduce the dangers and costs of medical identity theft.





“The infrastructure to support HIT adoption should be in place well before 2011 if physicians and hospitals are to be prepared to benefit from the most generous Medicare and Medicaid bonuses. Meeting this deadline will be challenging.”²

*David Blumenthal, MD,
National Coordinator
for Health Information
Technology, U.S.
Department of Health and
Human Services*

- \$500 million for the Social Security Administration
- \$50 million for information technology within the Veterans Benefits Administration

Incentives

- Establishment of incentive payments through Medicare for the meaningful use of certified EHR technology by “eligible professionals and hospitals.” If an eligible professional does not demonstrate meaningful use by 2015, his/her reimbursement payments under Medicare will begin to be reduced.

The Stick: Legislation

In the U.S., the infusion of billions of dollars for HIT by ARRA is accompanied by additional mandates under the 1996 Health Insurance Portability and Accountability Act (HIPAA), a comprehensive law that drives the development of private and secure EDI for specified administrative and financial healthcare transactions. Under the new ARRA provisions healthcare business associates that were not included when HIPAA was written are now subject to its mandates. As for the stick, HIPAA can also impose substantial penalties for non-compliance.

Security Breach Notification

HIPAA mandates stringent standards for maintaining the confidentiality, integrity and availability of electronic healthcare records. In addition, it also establishes a federal security breach notification requirement. This requires that an individual be notified if there is an unauthorized disclosure or use of their health information. States are also mindful of the privacy problem. Today, 44 states, the District of Columbia, Puerto Rico and the Virgin Islands have enacted legislation requiring notification of security breaches involving personal information.

Other Legislation

Another significant piece of U.S. legislation, the Health Information Technology Act, was introduced in the U.S. House of Representatives in September, 2008. As introduced, this legislation would set up a Health IT Advisory Committee to make recommendations to the Secretary of Health and Human Services (HHS) for issuing standards in a number of areas including interoperability, privacy/security, and maximizing the clinical utility of HIT. The result of these existing and future privacy and security regulations will be increasing patient and consumer acceptance of, and trust in, EHR and electronically connected healthcare systems.

High Hopes for HIT

There’s a simple reason for this carrot-and-stick approach. There are extraordinarily high expectations that HIT will be able to significantly improve the accuracy, efficiency and effectiveness of health care delivery. According to the U.S. HHS department, expected benefits of HIT include:

- Improved health care quality
- Expansion of access to affordable care
- Prevention of medical errors
- More efficient use of staff time
- Reduction of health care costs
- Reduced travel for patients and clinicians
- Increased administrative efficiencies
- Increased clinician collaboration
- Decreased paperwork
- Decreased inequities in healthcare access

These are exceptionally significant benefits, and they place an enormous amount of pressure on U.S. hospitals and health care systems to quickly ramp up their HIT capabilities, and to begin delivery of these benefits on an accelerated timetable.

HIT Savings and Spending

What kinds of cost savings are possible? RAND corporation, a respected industry analyst and research consultant, estimates efficiency-driven, HIT-enabled savings in the summary table shown on page 5, which is contingent on adoption of EHR systems in both inpatient and outpatient settings.³

Emerging National Backbone Networks

Crucial to achieving optimum benefit from HIT initiatives are emerging Health Information Organizations (HIO). These entities unite healthcare stakeholders within defined geographic regions and govern healthcare information exchanges among them. Health data banks, specialty care organizations, integrated delivery networks and Regional Health Information Organizations (RHIO) are being deployed worldwide to streamline information sharing locally, regionally

² *Stimulating the Adoption of Health Information Technology*, New England Journal of Medicine, March 25, 2009

³ *Extrapolating Evidence of Health Information Technology Savings and Costs*, Rand Corporation, 2005

SUMMARY OF HIT-ENABLED EFFICIENCY SAVINGS

PAYERS:	(\$ BILLIONS)					
	POTENTIAL SAVINGS	MEAN YEARLY SAVINGS	CUMULATIVE SAVINGS	SAVINGS YEAR 5	SAVINGS YEAR 10	SAVINGS YEAR 15
Outpatient						
• Transcription	1.9	0.9	13.4	0.4	1.2	1.7
• Chart Pulls	1.7	0.8	11.9	0.4	1.1	1.5
• Laboratory Tests	2.2	1.1	15.9	0.5	1.5	2.0
• Drug Utilization	12.9	6.2	92.3	3.0	8.6	11.8
• Radiology	3.6	1.7	25.6	0.8	2.4	3.3
Total	22.3	10.6	159.0	5.2	14.8	20.4
Inpatient						
• Nurse Shortage	12.7	7.1	106.4	3.4	10.0	13.7
• Laboratory Tests	3.0	1.6	23.4	0.8	2.2	2.8
• Drug Utilization	3.7	2.0	29.3	1.0	2.8	3.5
• Length of Stay	36.7	19.3	289.6	10.1	27.6	34.7
• Medical Records	2.5	1.3	19.9	0.7	1.9	2.4
Total	58.6	31.2	468.5	16.1	44.5	57.1
Total	80.9	41.8	627.5	21.3	59.2	77.4

and nationally. In some European countries, including Norway, Sweden and the U.K., governments have established national high-speed networks reserved for healthcare use. The U.S., with the vision of the National Health Information Network (NHIN), is doing the same.

The U.S. Department of Health and Human Services (HSS) reports that the “Nationwide Health Information Network is being developed to provide a secure, nationwide, interoperable health information infrastructure that will connect providers, consumers, and others involved in supporting health and health care.” The government is also supporting the development of 16 Health Information Enterprises (HIE) as trial implementations of the NHIN.

Other nationwide networks are also being developed. For instance, the U.S. Federal Communications Commission (FCC) has initiated the Rural Health Care Pilot Program, a “pilot funding program to facilitate the creation of a nationwide broadband network dedicated to health care, connecting public and private non-profit health care providers in rural and urban locations.”

Also under development are networks from a number of Regional Health Information Organizations. Increasingly digitized hospitals, medical centers and other health-centric facilities—including health information interchanges, integrated delivery services, health plans, and state, regional and federal agencies—will leverage these emerging high speed

backbone networks to reap maximum benefit for patients, doctors and other medical professionals.

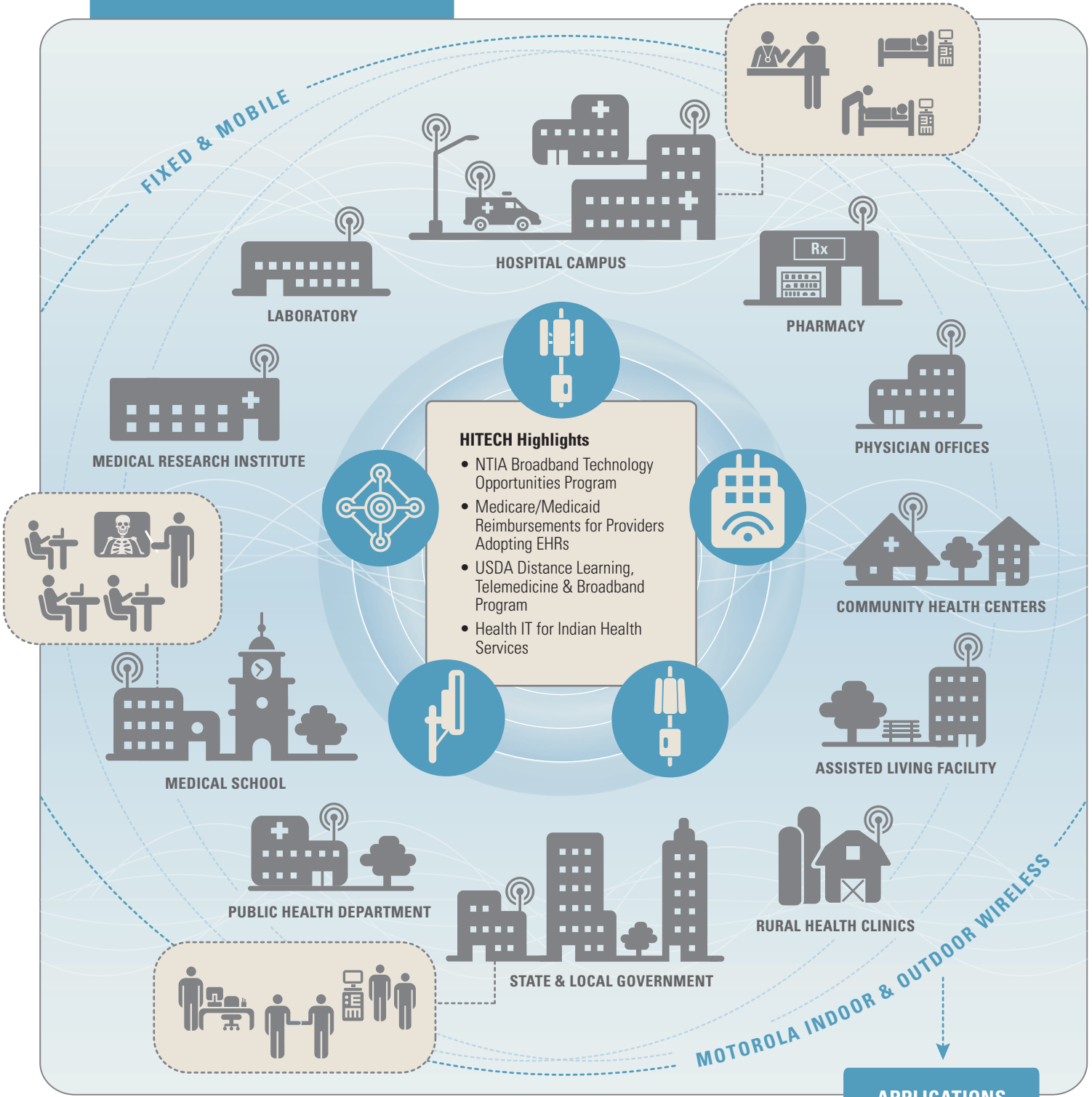
As a core building block of National Health Information Networks, wireless broadband technology greatly extends the reach, impact and benefits of telemedicine programs in rural areas, community-based telehealth initiatives and paperless healthcare environments.

“To build a national network of interoperable health records, collaborative efforts must first develop at the local and state levels.”

Healthcare Information and Management Systems Society (HIMSS)



HEALTH INFORMATION NETWORKS



APPLICATIONS

High Speed Connectivity

- RHIO
- NHIN
- Mobile EMT Communications
- Mobile Clinics

Secure Access

- Electronic Health Records
- MRIs and CAT Scans
- e-prescriptions
- Patient-Provider Messaging

Health Emergency Preparedness

- Leased Line Replacement
- Fiber Extensions
- Back-Up Networks

Video for Telehealth

- Patient-Provider Consultations
- Remote Patient Monitoring
- Video Surveillance
- Virtual Training

Healthcare Discovers Motorola Connectivity

Motorola is a trusted, long-standing communications partner of local, state and federal governments. Our offerings of fixed and mobile wireless broadband networks, indoor wireless networks, powerful network security technologies and rugged and reliable mobile computing devices are used by public safety and public works agencies worldwide. Not surprisingly, more and more healthcare institutions and professionals are now working with Motorola to take maximum advantage of incentives and funding for HIT.

The Motorola Wireless Broadband Portfolio

Motorola's portfolio of wireless broadband solutions is globally proven to deliver the speed, access, reliability and security that help bring the best possible care to every patient. Motorola solutions include:

Point-to-Point (PTP) Wireless Ethernet Bridge Solutions. Motorola's PTP solutions provide high throughput connectivity and backhaul for data and video between two locations, a function critical to the timely delivery of health information technology. Proven to deliver 99.999 percent availability and data rates up to 300 megabytes per second (Mbps) in both licensed and unlicensed frequencies, our PTP networks provide carrier-grade reliability for transmitting bandwidth demanding medical images such as MRIs, X-rays and CAT scans. In addition, our PTP Ethernet bridges offer exceptional interference tolerance providing access and coverage to other shared community resources and facilities that may be located long distances away or in hard to reach areas.

Point-to-Multipoint (PMP) Solutions. Our PMP networks use unlicensed spectrum to deliver and support high-speed applications and connectivity. Healthcare providers use PMP networks to connect multiple locations on a medical campus and to



facilitate collaborative telemedicine from a specific building or facility, or in situations in which a number of locations need access to a common application.

Mesh Wide Area Network Solutions. Motorola mesh networks use WiFi and purpose-built MEA (Mobility Enabled Access) technologies to provide fixed and mobile IP-based communications solutions over a wide area. Our Mesh Wide Area Network Solutions establish ad hoc networks that give EMTs and other first responders instant access to real-time information and the ability to communicate emergency medical data to a hospital even while treating a patient en route. With a mesh network, clinics, labs and community-based healthcare locations can transmit medical information exactly when and where it's needed.

Indoor Wireless LAN

Wireless Local Area Network (WLAN) Solutions. Motorola's WLAN solutions provide health care organizations with indoor mobility and communications. WLAN communications enable leading-edge applications such as barcode scanning of medications and blood at the bedside, enabling faster and more accurate communications between physicians, nurses and pharmacists and unfettering technology so machines can move more easily to the patient, improving care and increasing efficiency.

BENEFITS OF MOTOROLA HEALTH CARE SOLUTIONS

- High availability and continuous access to health information.
- Rapid deployment that enables early adopters of HIT to maximize incentive payments and funding sources.
- Scalable technology to accommodate future capacity and incremental expansions of integrated delivery networks.
- Flexible networks that support open standards and interoperable healthcare systems.
- Sufficient bandwidth for access to clinical applications and to support large volumes of data.

HIT IN THE REAL WORLD

The use of Health Information Technology is rapidly gaining momentum in the United States and wireless broadband is often a core solution component. Here are a few examples of how HIT and EHRs are in the planning stages or are already in use in the health care industry:

- The U.S. Department of Veterans Affairs provides home telehealth technology to veterans for increased self management of chronic conditions. A recent study found a 25 percent reduction in the average number of days hospitalized, and a 19 percent reduction in hospitalizations themselves for patients using home telehealth.
- The Social Security Administration announced it is the first government agency to utilize the National Health Information Network (NHIN), receiving medical records for some disability applicants electronically through the NHIN gateway.
- In 2009, the Centers for Medicare and Medicaid will add more patient consultations to the list of reimbursable electronic health services.
- Blue Cross and Blue Shield of Massachusetts will begin offering doctors bonus payments for using electronic prescription systems beginning in 2011.

Indoor/Outdoor Security Leadership

Motorola is a leader in providing wireless security for HIPAA-aware environments. Our data encryption solution includes DES for 56-bit encryption, and 128-bit AES encryption. Unauthorized access and modification to electronic personal health information (EPHI) transmitted over a communication network is mitigated. Motorola enhances its outdoor network security with GPS synchronization, authentication technology, WPA2 WiFi security and additional signal scrambling features.

Motorola's indoor WLAN networks use the Motorola AirDefense Solution, which provides continuous sensing, intrusion protection, vulnerability management and troubleshooting

capabilities. It safeguards proprietary information and enables compliance with government regulations for protection of EHRs. The solution allows organizations to identify hackers, attacks and network vulnerabilities and to instantly terminate the connection to any rogue device.

Network Design and Management

Motorola's 80 years of wireless expertise are the foundation of the One Point Wireless Suite, a powerful set of software solutions used to design, deploy and manage Motorola wireless networks. Powerful RF prediction engines and intuitive 3-D user interfaces enable the design of reliable networks for the most demanding data, video and voice applications. Unified and map-based network visualizations help network administrators more efficiently manage and respond to any network issues so that connectivity is quickly restored. The One Point Wireless Suite provides the reliable and always-available network coverage that is critical in healthcare environments.

Mobile Computing

Motorola is also a leader in mobile computing, offering many of the industry's most powerful, most feature-rich handheld computers and devices that bring EHRs directly to the bedside or wherever doctors or nurses need them. The Motorola handhelds are intuitive and easy to use, can be fully ruggedized to be drop-resistant, dust-resistant and water resistant, weigh only one or two pounds and provide powerful performance and exceptional connectivity.

The First Choice in HIT

As the development and implementation of leading-edge HIT networks accelerates, a growing number of care delivery organizations and other stakeholders are working with Motorola to help them qualify for, and take maximum advantage of internal HIT budgets and government programs for healthcare funding. Motorola's wireless leadership and expertise can help healthcare providers of all sizes plan, deploy and manage HIT networks that help fulfill the promise of EHRs: saving time, saving effort, saving dollars, and above all, saving lives.



MOTOROLA

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