



Revitalizing Healthcare Delivery with Mobile Communications

PART ONE: Overview

This four-part series examines the ways that wireless technology and mobile communications can enhance the efficiency and quality of institutional healthcare, improving the processes through which doctors, nurses, specialists and support staff members deliver medical treatment. Part One offers an overview of the current healthcare situation and suggests ways in which wireless technology solutions address healthcare challenges.

Escalating Healthcare Challenges

Healthcare challenges rank among the most serious concerns of communities around the globe. Multiple factors are driving many systems to the brink of crisis. Aging populations; emerging disease threats; rising healthcare costs; and shortages of healthcare professionals all contribute to the overall problem. These well-documented issues present substantial challenges. Advances in wireless technology, however, offer opportunities to revitalize healthcare institutions, improving communication and contributing to the efficiency and effectiveness of doctors, nurses and support staff members. With wireless technology and unified communication tools in place, healthcare organizations can deliver higher quality care to patients while efficiently containing costs.

In a study conducted by the Spyglass Consulting Group¹, released in November 2006, three key factors were shown to drive the adoption of mobile communications solutions in healthcare:

1. **Efforts to improve patient safety:** Medical errors cost insurers and healthcare providers billions of dollars a year, causing millions of injuries and up to 98,000 deaths. The healthcare industry is determined to make improvements in this area by focusing on patient safety issues.
2. **Rising healthcare costs:** Healthcare spending is high (14.1% of the GDP in the U.S.) and getting higher (with projections of double-digit rate increases) as baby boomers reach retirement age.
3. **Chronic labor shortages:** Shortages of healthcare workers also impact patient safety, as workers in healthcare facilities struggle to deliver an acceptable level of patient care. Retiring baby boomers will create additional pressures in this area.

Quality patient care can be achieved through better monitoring of patient conditions, more precise communication among doctors and nurses, better access to information for improved decision-making and improved coordination among staff members in performing daily tasks. These types of activities are well suited to smartphone solutions.

Benefits from Wireless Technology

Wireless technology, and especially the latest generation smartphones, offer opportunities for substantially improving healthcare processes and providing a unified communication framework for staff members. Technology advances include:

- Strengthened communication security, in support of patient privacy regulations
- Push data delivery, ensuring prompt notification in the event of medical crises or urgent situations
- Dual-mode connectivity (combining cellular and Wi-Fi), minimizing barriers to communication inside buildings or while traveling
- Single point of contact through integrated smartphone applications, providing better coordination of communication tasks among doctors, nurses and support staff members
- Improved access to vital electronic medical records (EMR), decision support tools, medical references and similar resources

¹ *Healthcare Without Bounds: Trends in Mobile Communications*, Gregg Malkary, Spyglass Consulting Group, November 2006.

The greater functionality of converged device solutions—such as the smartphone—has helped overcome traditional barriers to adoption, such as doctors who normally shun computer-based solutions. As reported by Spyglass Consulting Group², 82% of the physicians surveyed prefer a single communication device that combines functionality rather than a collection of pagers, cell phones, PDAs and other devices.

In institutions that have adopted wireless technologies, studies indicate marked improvements in workflow efficiency. A leading Canadian healthcare organization with over 2000 staff members performed a cost benefit analysis of a mobile communication solution to be deployed in their facility. The analysis concluded that the voice and text communication benefits alone would recover up to 12% percent of a nurse's time, which could then be directed to improved patient care. This organization calculated annual savings for their staff of almost USD 16 million annually, equal to the work performed by 192 full-time nurses. Similar or higher levels of savings were demonstrated for other healthcare worker specialties.

Examples and short case studies in this series describe the use of the BlackBerry® Enterprise Solution and smartphones from Research In Motion (RIM). RIM has pioneered many of the technologies that equip the mobile workforce with tools to increase their productivity. From the initial breakthroughs in wireless voice and email communications, BlackBerry® solutions have been broadly adopted across a span of industries—including manufacturing, real estate, logistics, pharmaceutical, financial services and government. Push-communication capabilities, built-in security features and the wide selection of enterprise-specific applications have contributed to the acceptance of the BlackBerry solution.

Throughout this series, a variety of scenarios discuss cellular and Wi-Fi approaches to communications, as well as the expanded potential for an emerging generation of dual-band smartphones that can take advantage of any available wireless network connections.

"The combination of email, cell phone, organizer and electronic prescription system in one secure BlackBerry smartphone is an innovative and spectacular improvement in e-prescribing technology. This solution can increase safety, save patients' time and money and make life easier for physicians."

– Deborah Whitehead, Assistant Vice President for Pharmacy, Tufts Health Plan, USA

Fresh Solutions to Healthcare Issues

Faced with an aging population, rising healthcare costs and new disease threats, many healthcare organizations are seeking new techniques to deliver quality healthcare in a timely, cost-effective and efficient manner.

In response to today's challenges, hospitals and clinics are increasingly rethinking their traditional models for providing healthcare services. In many cases, this leads to the consideration of emerging technologies with the potential to empower staff members with better communication tools—applications that strongly support work processes and can adapt to diverse environments with flexibility.

Wireless technology advances effectively address the most pressing industry concerns and create environments where high quality healthcare can flourish.

² Healthcare Without Bounds: Trends in Mobile Communications, Gregg Malkary, Spyglass Consulting Group, November 2006, page 49.

<p><i>The typical concerns for many healthcare organizations are:</i></p>	<p><i>Fresh solutions and innovative approaches are needed to counter serious healthcare concerns. Those involved in understanding the problems, addressing the challenges and developing solutions include:</i></p>	<p><i>Technology alone can't meet the challenges of the healthcare industry, but a strong communication infrastructure can:</i></p>
<ul style="list-style-type: none"> • Revenue generation and cost containment • Attraction and retention of skilled healthcare professionals • Wait times for available hospital beds • IT infrastructure investment • Best practice and decision support processes 	<ul style="list-style-type: none"> • Stakeholders in healthcare IT groups • Telecommunication companies that provide the communication platforms • Privacy advocates and legislative bodies concerned with information distribution issues • End users—including the doctors, nurses, and staff members—who will embrace or reject proposed technology solutions 	<ul style="list-style-type: none"> • Facilitate staff member interactions and coordinate activities. • Support work processes and policies in effect within the institution. • Place vital tools and current information in the hands of those who evaluate, administer and provide healthcare services.

"The BlackBerry solution is a truly HIPAA- and FERPA-compliant solution for end-to-end communication."

—Dr. John D. Halamka, CIO, Harvard Medical School

Safeguarding Patient Records

Data security is a prime concern at Harvard Medical School, where the IT department recently deployed a BlackBerry Enterprise Solution to meet the needs of the IT support group, doctors and administrators.

With 18,000 individuals who regularly connect to the school's network, having a robust, dependable solution—to keep records and information accessible and yet securely protected—was an essential requirement.

The CIO, Dr. John D. Halamka, who oversaw the deployment, commented on the importance of security: "In the medical profession, we have to be compliant with both HIPAA (Health Insurance Portability and Accountability Act) to protect confidential patient information and FERPA (Family Educational Rights and Privacy Act) to protect student data. You only have to look at the Veterans Administration's unfortunate spill of 26 million

veterans' records to see how devastating an information leak can be. We move 100 million patient records or 100 Terabits of data a day and we haven't had handwritten doctor's orders or X-ray film since 2001. Our doctors rely on the ability to communicate digitally. What's unique about BlackBerry smartphones is they use robust, cryptographic, key-based encryption. And there is never a point at which the message is being sent between the BlackBerry® Enterprise Server and the BlackBerry smartphone in an unencrypted fashion. The BlackBerry solution is a truly HIPAA- and FERPA-compliant solution for end-to-end communication."

For more information, view *CIO Perspective: BlackBerry Security* at www.blackberry.com/bettercomms.

Streamlining Work Processes with Improved Communications

The barrage of information, communications and task requests faced by most overworked healthcare facility staff members is simply overwhelming and creates multiple problems downstream. Miscommunication or delayed communication contribute to inefficiency and operational costs, but—more importantly—communication problems can also be life-threatening in a medical environment.

Each broken link in the communication chain that includes doctors, nurses, pharmacists, support workers, administrators and others represents an opportunity for delay, error or worse. For example:

- Does a nurse need the physician's approval for a higher dose of medication in response to the latest diagnostic indications?
- Is the resident cardiac specialist available for an urgent consultation?
- Are receptionists or unit clerks able to easily transfer calls directly to the right staff member?
- Are housekeeping staff members promptly notified of a vacant room in maternity to accommodate an incoming patient?
- Is the doctor directly notified of his patient's lab results in a timely manner?
- Has the shortage in subcutaneous fluid packs been communicated to materials management?
- Are porters effectively managing their time and the movement of patients?

Most 'modern' healthcare facilities still rely on outdated communication technology. Very often, this is an uncoordinated collection of devices from various eras: pagers, public address systems, mounted and portable house phones, PDAs, handwritten status reports and patient records, cell phones and walkie talkies.

Work processes improve when a reliable, systematic means of communication is in place, providing a mechanism for tasks to be prioritized, important messages to be acknowledged, vital data to be confirmed and organizational policies to be distributed and enforced.

Improved Quality through Better Access to Relevant Data

Information drives many different parts of the healthcare delivery system. Immediate access to vital information—such as medical histories, drug interactions, lab results, diagnostic equipment availability and similar data—can sharpen decision-making, reduce medical errors and boost staff productivity.

In an executive survey conducted by Research In Motion (RIM) in October 2006, healthcare professionals were asked what three processes or applications they would like to have available in a mobile solution. As shown in the graph in Figure 1, the results strongly favored emergency medical records (EMR), medication safety and communications.

"Our goal is to combine telemedicine with nursing, feet on the ground, to keep people healthy, improve their quality of life, and keep them out of hospitals."

– Jeff Forbes, CIO, Tellicare

Overcoming Inefficiency

The current fragmented approach to healthcare delivery results in wasted energy, frustrated workers and error-prone medical treatment. With staff members frequently trying to cope with multiple communication devices, instructions and queries are often delayed or overlooked. Critical messages may not be received promptly, simply because staff members tend to be driven by interruptions coming from every direction.

This kind of miscommunication and disconnected workflow lie at the heart of many healthcare facility problems—a root cause of inefficiency and error. Treatment information scrawled on a notepad may be misread or misinterpreted. The instructions from a nurse ending a shift may not be relayed accurately to the nurse on the next shift. A patient’s drug allergy records may not be readily available when prescribing a new medication. Malfunctioning air conditioning or heating equipment within the facility may not be corrected promptly, making patients uncomfortable. All in all, the stress on staff members trying to contend with multiple communications from a variety of sources may lead to faulty decision-making or ill-advised actions.

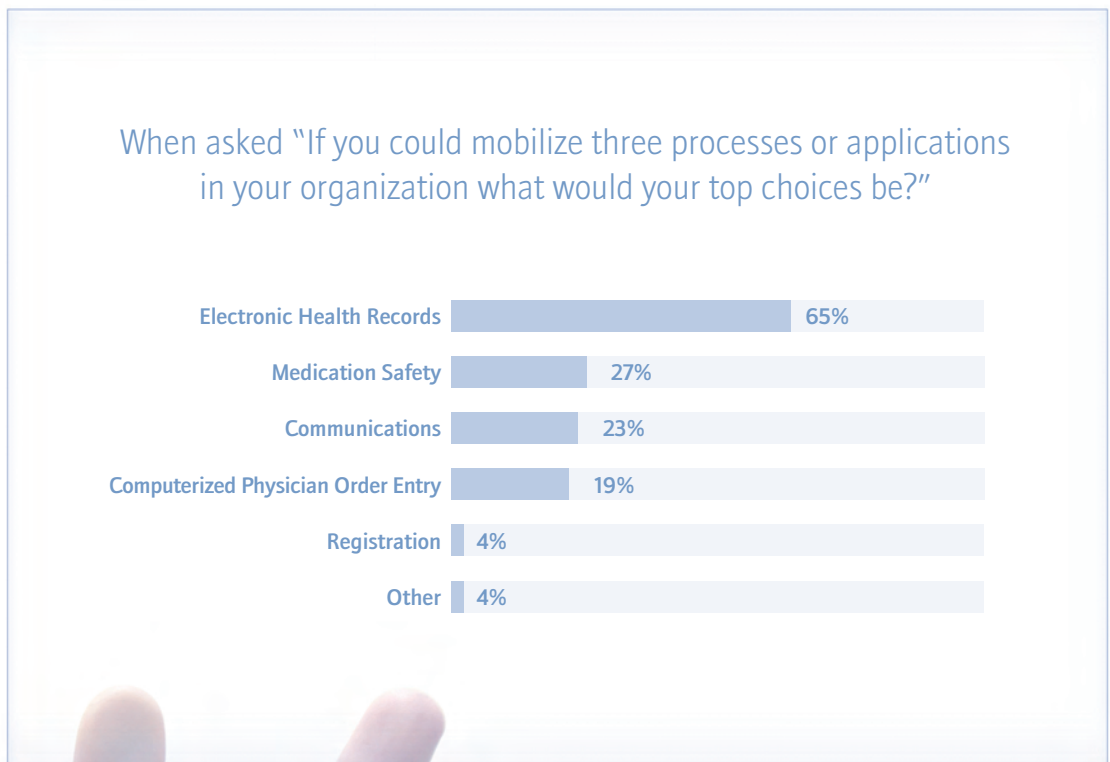


Figure 1. Preferences for mobilized applications: U.S. Top 300 - Healthcare Executive survey, RIM - October 2006

Asking the Right Questions

In choosing a mobile communication solution, healthcare organizations should consider these important questions:

1. Can several communications functions be consolidated into a single device?
2. What are the unique requirements of different user groups in the organization?
3. How will the use of this new technology impact existing workflows?
4. How can wireless devices increase adoption of electronic health records (EHR)?

Existing solutions, such as paging, usually do not add additional costs. However, organizations should evaluate the overall costs associated with paging, factoring in the impact on workflow efficiency and indirect expenses resulting from miscommunication.

Providing realistic answers to these kinds of questions can help select a technology solution well suited to an organization's needs. Perhaps the single most important characteristic of a solution is how well it provides a unified approach to communications. Improved communications lead naturally to workflow efficiency. In contrast, non-unified, disconnected communication processes often lead to judgment problems, inefficiency and a disruptive work environment.

Part Two of this series takes a closer look at popular communication devices and considers their usefulness and effectiveness within healthcare facilities.