

## Creating More Time for Patient Care with Dynamic Communications

Today, the challenges of providing high-quality, affordable care to an aging population, while managing clinician shortages, are greater than ever. More and more, clinicians and experts must be brought to the patient's bedside physically and virtually. This brings new requirements for healthcare professionals to share information, communicate and collaborate in real time from multiple locations. Communications become a strategic asset for successful healthcare transformation.

Dynamic communications solutions that enable the real-time flow of information and knowledge in clinical and administrative workflows can dramatically reduce the time between a patient event and its outcome. When this time is reduced, patients receive higher quality care, outcomes are improved, clinicians are more satisfied and operations are more efficient.

Using real-life examples and scenarios, this paper describes how Alcatel-Lucent dynamic communications solutions help healthcare professionals connect when they need to, from anywhere and in real time, to create more time for patient care.

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## Uniting for the good of the patient

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*“It has become necessary to develop medicine as a cooperative science, the clinician, the specialist, and the laboratory workers uniting for the good of the patient.”*

DR. WILLIAM MAYO, CIRCA 1900

The quote from Dr. Mayo is prescient — it still stands true — the only real update may be that clinicians, specialists, labs and patients may now be anywhere and care may be administered both in person and remotely.

Today, a combination of financial, regulatory and human dynamics is pushing the patient bedside out of the hospital and into the home or smaller, remote clinics. Healthcare systems are facing rising costs while managing the needs of an aging population and the burden of chronic disease. They must adhere to increasingly complex regulatory requirements. They are trying to cope with clinician shortages while meeting the higher expectations of patients and their families who have become consumers of care, researching and demanding more and better customer service and care for their money. And all of this is happening against the backdrop of a technological boom that has shaped and transformed almost every other industry on a global scale.

To ensure their sustainability in this challenging environment, healthcare systems must innovate by delivering a combination of local and remote caregiving. This requires dynamic communications that enable real-time collaboration and exchange of knowledge across roles and locations. With this approach, time and space can be collapsed so patients receive the care they need, when they need it, no matter where they are located or where the clinician or caregiver is located.

To achieve this transformation, healthcare systems must evolve from an information technology (IT)-centric approach to a communications-centric approach based on information and communications technology (ICT). Leveraging ICT solutions to provide the highest quality of patient care can and will produce financially sound and viable healthcare systems. When integrated with the healthcare systems' business and clinical strategies, ICT will be a competitive differentiator for healthcare organizations and it will enable them to address the challenges they face.

## Using dynamic communications to improve care delivery

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Historically, the concept of patient care has been based on physically bringing clinicians and other experts together, or to where the information, or medical device, resided. This usually meant the patient bedside. Today, with all of the complex challenges within the healthcare sector, the traditional model of care can no longer support demand for highest quality, affordable care.

By allowing real-time knowledge to be accessed as early as possible in the cycle of care, the time to treat, or administer care, can be greatly reduced, substantially enhancing patient outcomes. For example, it may mean that a physician can receive a computed tomography (CT) scan slice of a head trauma in less than a minute on a mobile device. It may be just a few slices of the scan at medium resolution but it's good enough to help the neurosurgeon immediately begin the cycle of care from any location, saving valuable time.

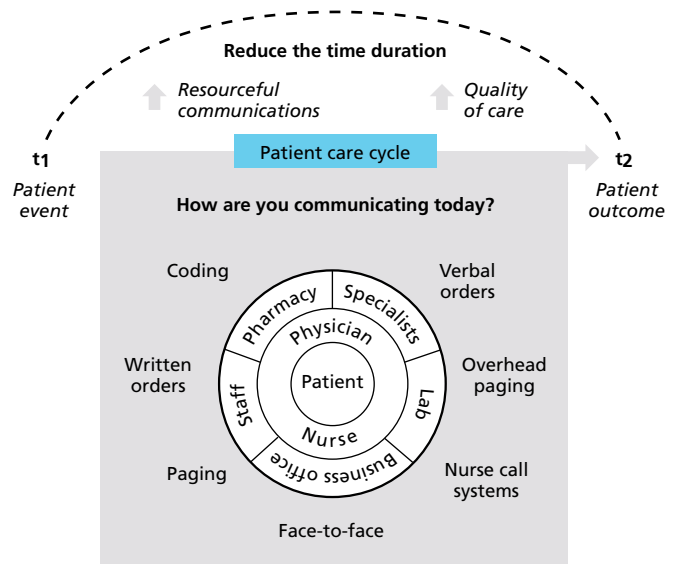
### **Decreasing the time between a patient event and its outcome**

Consider, too, the following scenario involving care in a hospital. A nurse notices the call button is active. She goes to the patient's room and the patient tells her about unmanaged symptoms. The nurse reviews the patient chart then tries to locate the physician to collaborate and get an order for

new medication. Unfortunately, as it's a busy night, the nurse and doctor are unable to connect and the process, or workflow, is stalled. Meanwhile, the patient grows increasingly uncomfortable. Eventually the nurse connects with the doctor and the order is submitted. In an attempt to speed up the process and reassure the patient, the nurse calls the pharmacy repeatedly to check on the order status then relays that information back to the patient. Finally, the medication arrives.

This scenario changes dramatically with dynamic communications. Now when the patient presses the nurse call button, the call goes directly to a selected nurse who is carrying a mobile device. With caller ID, the nurse knows the patient's room number and can answer the call where she is. When it's time to contact the physician to collaborate, the nurse uses the directory on the mobile device to dial by name, by role, by shift, or by availability. With the presence information provided, the nurse can see that Dr. Smith is on another call. Instead of leaving a voice message or paging and hoping it is heard, the nurse can send a text message to Dr. Smith's mobile device and he can reply immediately.

**Figure 1. Dynamic communications can reduce the amount of time between a patient event and its outcome**



The same benefit applies to communications between departments. Now when the nurse sends a script in to the pharmacy, the pharmacy can send a quick text message reply confirming receipt. The pharmacist can also see when the physician is available (not on the phone) and, with a simple click, establish a call to immediately get answers to any questions. The nurse can join the call to learn the time frame in which the order will be completed.

### Delivering care across multiple locations and populations

Healthcare systems must also deliver care across various geographies and demographics. From metro areas to rural districts, it can be challenging to attract and retain key physicians and clinicians and keep up with the capital expenditures required for medical advances while offering services to the community. Because technology increases the ability of high-quality labs and other organizations to provide services anywhere, it makes financial and clinical sense to create partnerships between large care providers and smaller primary or community care organizations to better-serve the needs of all types of communities.

For example, a hospital may not have access to the resources to deliver services to a community but a virtual partnership may enable it to bring top clinical talent to its community. This allows organizations to streamline their core competencies and better position themselves in their markets. But what if the clinicians are scattered over a broad geographic region? How do dynamic communications help patients when the point of care is a small intensive care unit (ICU) in a regional hospital and the clinician is 160 km (100 mi) away?

A rural patient who needs a clinical opinion or diagnosis may not have to travel to the specialist but could have the lab work sent or accessed through the web. This model can be taken a step or two further. A patient in a rural area living with several chronic, but manageable, diseases can be remotely monitored. The patient has the freedom to go about his daily routine and feel secure knowing his illnesses are being monitored.

In both of these examples, dynamic communications that connect knowledge effectively collapse time and space to enable improved patient outcomes. Now let's take a closer look at the key elements — your network, your people and your processes — that need to be interconnected to access the right knowledge, at the right time, on the right device, and from anywhere.

## Building your point-of-care network

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To ensure care delivery and business continuity, healthcare systems must build a reliable base — a single network that is always on, secure and enables communications for patients, families, clinicians, systems and medical devices. This helps to reduce costs and eliminate silos of technology, information, and most importantly, silos of communications. Additionally, the network must support a range of services with assured coverage, reliability, quality, security and capacity because it is now in the path of care.

For example, many hospitals have a wireless system for pager coverage and a separate system for wireless LAN (WLAN) while clinicians and other staff use mobile phones. They may have radio frequency identification (RFID) tags for asset management and patient tracking on a proprietary system. Because there may not be complete network coverage, calls may go unanswered, pages unread and clinicians may find themselves carrying multiple, and possibly redundant, devices.

In addition, most healthcare systems face pressure from patients and families to use their mobile phones and laptops while in a healthcare facility. Physicians need to be connected to the healthcare system whether they are in the office, clinic, hospital or at home. Clinicians need to be connected to patients, to coding and monitoring systems and to other clinicians. And the healthcare system needs to provide dynamic communications that optimize clinical workflows.

Alcatel-Lucent helps healthcare systems develop one network that overlays and extends and that provides a single, flexible and standards-based infrastructure for wired and wireless technologies. The network enables mobile phones, paging, telemetry, WLAN and RFID to be extended anywhere on the campus, above or below ground. It also enables roaming from a WLAN to a 3G cellular data network while remaining logged on to an application. This keeps all users productive, connected and collaborating. And it helps the bottom line by reducing costs. Other considerations include working with a single mobile service provider to extend mobile phone coverage and enable more effective communications for clinicians, patients and their families.

Alcatel-Lucent also ensures mobile laptop security through the Alcatel-Lucent OmniAccess™ 3500 Nonstop Laptop Guardian. This unique wireless card enables IT staff to remotely revoke access to the laptop, perform a remote data kill and locate the laptop should it be lost or stolen. This same network security and management capability can be extended to desktop devices throughout the healthcare system to enable IT staff to modify, maintain and update computers throughout the organization without disturbing busy staff and clinicians.

A single network that aggregates a healthcare system's multiple wired and wireless technologies extends the richness and reach of care to every corner inside the hospital and outside the hospital as well. It is an important step toward a dynamic communications framework that reaches multiple devices and is cost beneficial.

## Connecting your people and streamlining your processes

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Today, most healthcare systems deliver information and communications in much the same way as their networks are laid out. This may mean that people in different departments and in different roles store and retrieve information differently and use separate communications systems.

Alcatel-Lucent helps healthcare systems connect people-to-people, people-to-devices and devices-to-devices, all to enable real-time collaboration that is independent of location. With this dynamic interconnection, clinical and administrative workflows can be optimized by applying specialized knowledge to drive process integration.

With solutions such as contact centers, voice routing, advanced mobility and unified communications, virtualization of resources and user profiling, healthcare systems can personalize tools for collaboration, customer service and mobility. This means they can connect multiple systems, such as nurse call systems, IV units, sensors, monitors and building security systems to the Alcatel-Lucent notification server, which can then pass information over IP to wireless handsets. With communications tools and solutions that are personalized by job role and function, nurses can speak with patients while away from the nurse's station, read lab values, send and receive codes and interact with other clinicians while on the move for improved patient care.

Alcatel-Lucent OmniTouch™ 8660 My Teamwork™ Conferencing and Collaboration software allows each individual to select the phone on which incoming calls are received. This fact is completely transparent to callers who only have to dial one number no matter which phone is selected. It also offers the ability to combine voice services with instant messaging, video and sharing of applications or forms at a bedside terminal, on a desktop computer, a laptop or on a mobile device without special client software. This enables collaboration even when a clinician is on the move, at home, or having a coffee at the local café because a monitor at a patient bedside now sends updates to the clinician. Reducing the time spent tracking down clinicians saves valuable time that is better spent on patient care.

Picture an emergency room (ER) night clerk at his computer when a patient comes in with chest pains. If an angioplasty can be performed within an hour to 90 minutes, damage to the heart can be dramatically reduced. To assemble the team, the clerk typically has to dial through a phone tree, leave messages, page and overhead page until a complete team is confirmed.

What if the ER clerk could simply click on the words "Shift B Cath Team" then click "Alert" to send an automated voice and text message to the entire team at once? Each team member would reply back to the clerk with confirmation of receipt and their availability. This can all be accomplished with the automated message delivery system included with Alcatel-Lucent OmniTouch 8660 My Teamwork or the emergency notification system from Alcatel-Lucent partner Voice Call. By contacting co-collaborators in real time by role and by availability, the time to conclude a patient event can be significantly decreased.

## Real-life examples: Alcatel-Lucent dynamic communications solutions for healthcare

Alcatel-Lucent dynamic communications solutions for healthcare are already helping a number of different healthcare organizations create more time for care delivery:

- Enabling bedside communications and virtual visits
- Securely accessing patient information anytime and from anywhere
- Connecting with the right people at the right time in a hospital
- Delivering care to remote patients
- Providing proactive disease management and preventive care virtually
- Helping emergency medical systems (EMS) professionals collaborate with hospitals

### **Enabling bedside communications and virtual visits**

For the past 30 years, end-of-life and home care have set the example for how to cost effectively use mobile communications and processes to provide the highest quality care in a respectful, timely manner. With their distributed care model, these organizations rely on mobility of information, clinicians and patients.

The Hospice of the Florida Suncoast in the United States describes hospice care as “a complex dance of interwoven services and processes set against a backdrop of a finite amount of time.” It knows that when care teams and care partners stay connected to patient information in real time, patient outcomes improve. By implementing Alcatel-Lucent dynamic communications solutions, The Hospice has become a dynamic enterprise — able to adapt to rapid, continuous growth while keeping clinicians and caregivers connected to their patients and families in real time.

For example, with Alcatel-Lucent OmniTouch 8660 My Teamwork software, The Hospice can enable both bedside communications and virtual visits using the staff’s laptops and WLAN connectivity. With instant messaging, voice and video streaming, a nurse can easily connect to the attending physician to recommend medication changes or contact the pharmacist to discuss drug interaction issues right from the bedside. The nurse can also quickly reach the hospice chaplain should a patient request a spiritual visit when nearing death.

For widely dispersed family members, these same capabilities allow the lead caregiver to conference in loved ones for a patient’s debriefing session or to converse directly with a patient. These sessions can be recorded for later playback so other family members in different time zones or with non-traditional work schedules can dial in to hear regular updates.

### **Securely accessing patient information from anywhere**

In a home care setting, The Visiting Nurse Association of Northern New Jersey (VNANNJ) provides their nurses with tablet PCs for home visits. While the tablet PCs make it easier to chart at the bedside and keep records up-to-date, synchronizing patient records was burdensome because the nurses had to find a physical location to connect to, either from the patient’s home or back at the office. This task alone was taking an average of 43 minutes per day per nurse. Nurse satisfaction levels were dropping until the Association installed wireless data cards.

Using high-speed, mobile point-of-care technology delivered by the Alcatel-Lucent OmniAccess 3500 Nonstop Laptop Guardian, the nurses can now document at the patient bedside in real time and in a fully secure environment. This means that a clinician or caregiver can access current patient records in real time. And it means patient information remains inaccessible by others should the nurse’s tablet PC be lost or stolen. Because laptops can be remotely managed over the air, maintenance and fixes can be administered remotely, meaning the laptop remains in the field where it most useful.

Nurses can also now read e-mail and conduct business from any location, even their cars. The results are impressive. Nurses now have an average of 57 additional minutes per day to spend on patient care. The VNANNJ envisions using this mobile information capability to help patients and families find physicians, e-mail physicians and even provide pictures of wounds to other clinicians to expedite care.

Advocate Health Care in Oak Brook, Illinois, is recognized as one of the leading integrated health-care delivery networks in the United States. As with many healthcare providers, Advocate needed to streamline and secure online and business-to-business operations.

With the Alcatel-Lucent OmniAccess 8550 Web Services Gateway (WSG), Advocate Health Care can deliver secure, automated business processes that provide information when and where it is needed while ensuring regulatory compliance and protecting sensitive information from misuse through complete information privacy and traceable user activity. They benefit from corporate-wide interoperability among business-critical internal information systems and external partner networks and a corporate-wide compliance infrastructure that reduces costs and risk.

### **Plugging into real-time communications**

In addition to the Alcatel-Lucent OmniAccess 8550 WSG, Advocate Health Care is also using Alcatel-Lucent OmniTouch 8660 My Teamwork to provide a single communications system for its more than 200 sites of care across the Chicago metropolitan area and to connect a variety of devices, including nurse call systems, overhead paging code systems, and IV infusion pumps.

Now nurses can receive valuable and timely alerts, along with information, on wireless handsets. Instead of running to answer phones ringing in fixed locations, nurses spend more time with patients. They also gain an element of comfort because team members can acknowledge they are responding to an emergency call by immediately sending a text message. The nurse no longer has to hope the right team members heard the overhead page.

*“Top quality patient care requires integrating individual elements such as clinicians, physicians, nurses, legal and administrative expertise into a coherent whole workflow; it also requires integrating silos of information in multiple systems.”*

GARY HORN, ADVOCATE HEALTH CARE

### **Providing proactive disease management and preventive healthcare**

In a telehealth and disease-management setting, Alcatel-Lucent and Canadian service provider SaskTel have created a joint project called Salveo, to deliver the Alcatel-Lucent TeleHealth Manager (THM). This platform provides an easy way for people to record physiological data, such as blood glucose levels and blood pressure readings, and lifestyle information, such as when they last ate, and securely share it with their personal caregivers and their healthcare team.

This cost-effective platform can also provide alerts, notifications and reminders to all concerned. For example, an individual may receive a text message, an e-mail or a phone call from an Interactive Voice Response (IVR) system when it's time to take a reading. And a healthcare professional may receive a notification if a reading is missing or if the reading falls outside a specified range.

The Alcatel-Lucent TeleHealth Manager uses Alcatel-Lucent contact center capabilities to provide remote monitoring information to nurses and other healthcare professionals in their homes or offices. This allows them to immediately consult with patients if they see abnormal readings, a lack of activity, or if they receive a call from a family member. Future enhancements will include monitoring and reporting for chronic illnesses, such as congestive heart failure, Chronic Obstructive Pulmonary Disease (COPD) and asthma.

*“This technology may hold the key to a new paradigm of diabetes and chronic illness management in primary care. We are looking forward to using this technology to introduce standard clinical diabetes management in the patient's home with the help of the Home and Community Care team and the patient's family physician.”*

DR. SHARON TOBE, SUNNYBROOK HOSPITAL, TORONTO, CANADA

Working with partners, Alcatel-Lucent is leveraging its technology to make disease management and telecare a reality. For example, Alcatel-Lucent is working with the University of Pittsburgh Medical Center (UPMC) on a Bluetooth-enabled digital stethoscope that will provide better and

more accurate auscultation by leveraging digital sound as well as digital signal analysis. This state-of-the-art stethoscope will first be used within hospitals. In a next step, it will enable patients at home to provide highly accurate digital sound and signal analysis to their physician or to a hospital.

### **Helping EMS first responders collaborate with hospital staff**

For emergency medical services (EMS) professionals, seconds can mean the difference between life and death. To make the right decisions, they must have the right tools, expertise and information at their fingertips. Recognizing this need, Alcatel-Lucent is partnering with UPMC to develop a real-time, mobile communications and collaboration platform that will help connect first responders at the point of care with critical medical knowledge and resources in the hospital.

With the benefit of high-bandwidth, wireless IP communications and Session Initiation Protocol (SIP)-based collaboration applications, EMS professionals will be able to exchange important information, including photos and medical images, and use mobile Voice over IP (VoIP) communications to arrange treatment. Most importantly, they will save crucial time in the early treatment of patients in the field.

### **Conclusion**

Understanding the complexities of healthcare information mobility and how that can be a crucial differentiator to the healthcare system — resulting in higher quality patient care, improved patient outcomes, clinician retention, faster bed turns and reduced errors — is critical to creating a healthier bottom line. Alcatel-Lucent understands that more dynamic communications in healthcare does not just include pushing information out to mobile devices. It may also include real-time, multi-directional communications and collaboration between a variety of clinicians with varying specialties and in disparate geographic locations.

As Dr. Mayo stated, it is necessary to treat patients cooperatively so that collaboration can occur anywhere. With more dynamic communications, a pool of resources for care delivery can expand to meet many new patient and community needs. And a care delivery organization can extend its reach beyond its current care model. In fact, dynamic communications can benefit every aspect of the clinical workflow.

Alcatel-Lucent brings healthcare organizations more than 100 years of communications expertise. Our solutions are found in every industry in 130 countries and we deliver mobile communications infrastructures to all the major mobile service providers as well as enterprises. This history and depth of experience has helped us understand how mobility can benefit every aspect of the clinical workflow.

## **DISCUSSION QUESTIONS FOR YOUR ORGANIZATION**

1. Do you view your ICT investments as expenses or assets for competitive advantage?
2. When you think about communications, are you thinking about dial tones and devices? Or are you thinking that with strategic, dynamic communications the point of care can be anywhere?
3. Is your network always available to deliver the highest quality of care?
4. With your people moving around, how do they locate one another and communicate? And what are your communications handoffs in the patient care cycle?
5. Are your mobility solutions and communications technologies enabling better care, or depleting your resources?
6. As the healthcare landscape undergoes radical transformation, where will you be? At the forefront, enabling better care in a financially viable model or frantically trying to stay afloat?

## Abbreviations

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COPD	Chronic Obstructive Pulmonary Disease
CT	computed tomography
EMS	emergency medical services
ER	emergency room
ICT	information and communications technology
ICU	intensive care unit
IP	Internet Protocol
IT	information technology
IVR	Interactive Voice Response
PC	personal computer
RFID	radio frequency identification
SIP	Session Initiation Protocol
VNANNJ	Visiting Nurse Association of Northern New Jersey
VoIP	Voice over IP
WLAN	wireless LAN

## Resources

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- Alcatel-Lucent healthcare solutions
- Alcatel-Lucent enterprise solutions
- [www.alcatel-lucent.com/TeleHealthManager](http://www.alcatel-lucent.com/TeleHealthManager)
- Next-generation communications at Advocate Health Care





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