

NEXT GENERATION PATIENT SELF-CARE

CSC

The Role of Technology

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Executive Summary

A critical element of a more effective and less costly health system is the requirement for patients and their families to take a more aggressive role in both preventing and managing disease. This includes adopting healthier lifestyles, working to reduce obesity or other precursors to disease, and following specific care management recommendations. Patient self-care is especially vital since the current challenge of care provider and hospital bed shortages will worsen as the population continues to age.

Technology will play a key role in the next generation of patient self-care, both in supporting care-related tasks *and* in allowing providers to monitor and communicate with patients without requiring face-to-face or telephone interaction. The concept is not new. Early programs have been sponsored by health plans, provider organizations and employers to promote self-care and continuity of care via remote monitoring and communication. These programs have demonstrated improved outcomes when the employed technology is easy for the patient to use and provides the type of support suited to the patient's health management challenge and care situation. One study of asthma patients using electronic peak flow monitors linked to mobile phones to record symptoms demonstrated that the ease of using a "staple of society" was a major contributor to the success of the program. Another showed that post-operative participants who already had Internet access were more likely to accept, and want to try to use, a web-based monitoring and messaging system.¹ The challenge, however, is to translate these successful pilot experiences into financially sustainable, widely-adopted care processes.

This paper provides an overview of the broad categories of technology's potential contributions to patient self-care, including the types of technologies and care situations involved. It concludes with a discussion of changing stakeholder roles and responsibilities that will enable widespread adoption, and predictions in terms of what to expect in the near and longer term.

Self-Care Program Overview

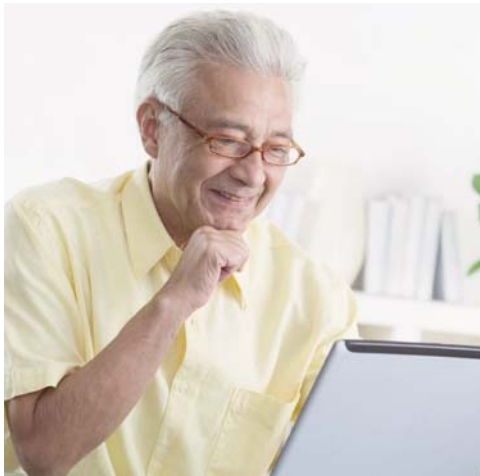
There is ample evidence that organized programs of support can enhance patient success in managing health and wellness. These programs can be categorized into three broad areas of the health management challenges they are designed to address.

Chronic Disease Self-Management

Chronic disease management has been the earliest target for organized programs to assist patients in their role as caregiver because of the enormous cost of caring for patients with chronic disease and the growing disease burden among the population.

Chronic Disease Costs and Implications:

- Healthcare spending for the ongoing management of chronic diseases accounts for *three quarters of the more than \$2 trillion spent on health care yearly in the U.S.*
- *Medicare patients* with chronic illnesses account for *more than 95 percent of total Medicare spending*
- This problem will only worsen as recent data show that *44 percent of Americans had at least one chronic condition in 2005*, up from 41 percent in 1996
- The percentage of those with *three or more chronic conditions* rose even more sharply from *13 percent to 22 percent for people ages 45 to 64 and up to 45 percent for those 65 to 79* during that time period²



Chronic disease patients, especially those who are elderly and have multiple chronic conditions, must take self-management actions every day, including monitoring status indicators such as blood glucose levels and taking action based on what they learn. For providers, periodic visits are often not sufficient to stay abreast of how well patients are doing. This is especially true when working with patients who are elderly, have difficulty managing their disease or possibly multiple chronic diseases and require continuous long-term monitoring of targeted care status indicators such as vital signs, medication compliance and activity levels, as well as intervention from care providers when their health status changes. For chronic disease self-management to be effective, it is essential to develop a program that provides additional information and support in a way that is meaningful and useful to patients. Two such programs are summarized below:

- *Keystone Mercy Health Plan's Healthy Hoops Program* is a community health education program that uses basketball to educate children and their families about managing asthma through proper nutrition, exercise and medication use. Program participants experienced a decrease in hospitalizations and ER visits, as well as increases in appropriate medication uses and treatment compliance.³
- *McDonough District Hospital (IL) Diabetes Program* has received recognition from the American Diabetes Association for offering quality education to promote effective patient self-management.⁴ The program offers individualized meal planning guidelines, lifestyle change instructions and individualized education.

Post-Acute Self-Care

Many hospitals are integrating post-acute self-care programs into their discharge processes in an effort to reduce inpatient length of stay (LOS) and decrease unplanned re-admissions. Effective programs enable patients to communicate frequently with caregivers when necessary and improve medication/treatment compliance and recovery rates. These programs also place a significant emphasis on effectively providing patients with education and information during the discharge process as well as proactive follow-up. For example, patients who took part in a re-engineered discharge planning process at Boston Medical Center were 30 percent less likely to be re-admitted or visit the emergency room. In addition, the improved discharge process reduced total costs by an average of \$412 per patient (costs were calculated as the sum of actual hospitalization costs and estimated outpatient costs).⁵

Operational Components of an Effective Discharge Planning Program:⁶

- Educating patients about their diagnosis throughout the stay
- Making appointments for clinician follow-up and post-discharge testing in consultation with the patient and discussing importance and any possible barriers
- Discussing with patients tests or studies completed in the hospital and who will be responsible for following up with results
- Organizing post-discharge services, making necessary appointments and reviewing details with patient
- After performing medication reconciliation, confirming details of post-discharge medication plan with the patient, including ensuring that the patient has a plan for obtaining medications
- Reconciling discharge plan with national guidelines and critical pathways
- Reviewing appropriate steps to take with patient if a problem arises, including what constitutes as an emergency and how to seek help
- Expediting transmission of a discharge summary to the physicians and other care providers accepting responsibility for the patient's care after discharge
- Assessing patient's degree of understanding by asking them to explain details of the plan in their own words
- Giving patients a written discharge plan at time of discharge that includes all of the information reviewed
- Contacting patient via phone within 2 - 3 days to review discharge plan again/resolve any problems



Post-acute patients require intensive monitoring of vital signs or other condition-specific measures in addition to changes in recovery status by care professionals typically over a period of thirty days, but this can vary depending on the severity of the patient's condition. Care needs include patient access to printed and/or online educational materials, clearly documented medication and/or treatment plans,

regular follow up calls from care providers (often called “coaches”) to assess status and provide support, and open channels for patients to communicate exacerbations of conditions.

Results from active programs are promising. At HealthEast Care System in Minnesota, a program was created to reduce unplanned re-admissions to St. John’s and St. Joseph’s Hospitals that includes the use of “transition coaches” who call patients and make house calls to help them understand medication changes, arrange follow-up appointments and ensure that patients are keeping up with therapy or dietary requirements. Of the first 166 people to complete transition coaching, only 8 percent were re-admitted in the 30 days following their hospital discharges. The re-admission rate was 13 percent for a comparison group of patients with no coaching.⁷

Health Maintenance

Health maintenance focuses on patient wellness and maintaining an overall healthy lifestyle so that patients avoid health problems that can lead to acute illness and chronic disease. It involves general care and regular check-ups, such as skin cancer screenings, mammograms, regular physicals or other preventive care required or desired by the patient, for generally healthy individuals. Good health can effectively delay, minimize the onset of, or prevent chronic conditions and serious health issues such as cancer, reducing care visits and lowering healthcare costs. Major focus areas for health maintenance programs are obesity, tobacco cessation and stress management.

There is a wide range of resources available to help the patient attain and maintain good health. Patients can learn more about their condition by communicating with health coaches either online or via phone, and educational materials are also available from other care providers. In addition, health plans such as BCBS-MA and Tufts Health Plan offer their members a fitness benefit to encourage physical activity and overall healthier members.

Destiny Health Plans offer a Vitality Program that rewards members for healthy activities and choices. Members earn Vitality “bucks” for attending wellness classes, working out at health club partners, or enrolling children in community sports programs. Vitality bucks can be redeemed for airline miles, hotel stays, magazine subscriptions and merchandise (www.glic-destiny.com).

Technologies to Support Patient Self-Care Management

Technology greatly enables all aspects of patient self-care management initiatives, further reducing costs and the need for skilled healthcare resources. For example, remote home monitoring can supplement or replace some visiting nurse house calls. Patient clinical data obtained by the visiting care provider or patient can be collected automatically by technology and sent directly to care providers via the Internet or cellular service.

Technology is also a conduit for making health maintenance resources readily available to patients. Patients can learn more about their condition by accessing educational material available on a number of Websites and by completing online health risk assessments. The use of health coaches, along with data collection and progress monitoring tools, can help patients set up a health maintenance plan, establish practical benchmarks, provide guidance and motivation, and check progress. Aetna and United Healthcare, for example, offer their members access to educational information as well as diet and exercise tracking tools via a secure website.

In addition, technology can supply patients with personalized information about their condition or post-hospital care and remind them to take medications or check vital signs. For the care team, technology solutions analyze incoming data and alert appropriate care providers when direct communication with the patient is necessary.

There is a wide range of technology solutions to match communication, data collection, education and clinical decision support needs of the patient, his/her care condition and the patient’s care team. For purposes of this paper they have been categorized as follows:

Hospital re-admissions cost the Medicare program \$15 billion annually, and \$12 billion of those costs are potentially avoidable. Decreasing re-admission rates within a 30 day window has therefore become a major government focus in an effort to cut costs. In the near future, Medicare payment could potentially be limited or denied if re-admissions are deemed “avoidable.”⁶

- *Patient technologies* – those physically located on the patient to collect patient data
- *Everyday technologies* – those that use cell phones, iPhones, PDAs, laptops and PCs, not requiring special equipment
- *Medical devices* – specially-developed solutions that collect data on physiologic status and communicate with providers as part of a care management program
- *Digital medical home* – technologies integrated into the home environment



Some are in general use but most are in pilot stages or part of research studies to prove that they are both technologically feasible and operationally useful. The challenge is to match the specific technology with the patient's care needs, willingness to use consistently and usefulness to the care providers. Current reimbursement models also limit widespread adoption in some cases.

This section describes the types of technologies in each category cited above, presents examples of how and where they are used, and describes in what types of self-care management it is usually applied – chronic disease management, post-hospital care, and health maintenance and improvement.

Patient Technologies

Most patient technologies are worn by the patient and used to continuously monitor vital signs. They are useful for all three categories of self-management, especially for the elderly and in situations such as post-operative surveillance. The information collected by the wearable device is sent wirelessly to an Internet-connected device such as a cell phone or laptop, and then sent to a secure application server and/or the provider's clinical information system. The application tracks trends and, using pre-set parameters, sends alerts to the care team if changes in the patient's clinical data indicate a need for medical assistance.

Device/Technology	Data Collected	Connectivity	Vendor/Product	Uses
Watch /RFID and biosensors	<ul style="list-style-type: none"> • Vital signs: pulse rate, 1-lead ECG, blood oxygen saturation level, temperature • Location data 	Real time or once daily to remote medical center	<ul style="list-style-type: none"> • Aerotel Medical Systems • LifeCare/MDKeeper • HomeFree Systems 	Health maintenance, especially for elderly
Skin /sensors	<ul style="list-style-type: none"> • 10 clinical parameters including 12-lead ECG, heart rate, RR-times, respiration, plethysmogram, oxygen saturation, and derived parameters • Patient can also send alert to physician 	Wirelessly using GPRS to server, physician can access via iPhone	• Dyna-Vision	Post-operative and continuous cardiac care
Wearable Monitor /recorder and docking station	<ul style="list-style-type: none"> • Patient activity including walking, sitting, standing • Pain level recording by patient 	Docking station recharges device and sends data to application server	• Healthcare Technologies LTD/Activ4Life	<ul style="list-style-type: none"> • Health maintenance for activity monitoring • Post operative care activity monitoring
Shirt /biosensors	<ul style="list-style-type: none"> • ECG, pulse, plethysmogram, blood pressure, pulse oximetry, posture and activity 	Bluetooth wireless connectivity to PDA device	• VivoMetrics/Life shirt	Health maintenance or activity monitoring

Several technology solutions can be embedded under the patient's skin to continuously provide treatment or monitor status or location. All are in early trials; the location-monitoring capabilities are considered the closest to "market ready." Applications so far have mostly involved the elderly and patients with Alzheimer's disease.

Device/Technology	Data Collected	Connectivity	Vendor/Product	Uses
Microchip /RFID	Patient identification and location monitoring	Wireless to RFID reader	VeriChip/Health Link	Patient tracking (Alzheimer's patients)
Microchip /RFID and biosensor	Glucose-sensing chip that would eliminate the need for diabetics to test using finger pricks.	Wireless to RFID reader	VeriChip and Receptors LLC/In Vivo Glucose Sensing RFID Microchip	Diabetic glucose testing

Everyday-Use Technologies (smart phones, PDAs, laptops and other Internet-accessible devices)

Currently, the most promising technology venue for self-management applications and services is technology that is already part of everyday life: smart phones and other Internet-accessible technologies including PDAs, laptops and PCs. Since these are mobile devices, patients can use them anywhere there is Internet access. They are useful for encouraging healthy lifestyle behaviors, and effective for health maintenance and chronic disease management for active patients.

One obvious advantage of these technologies is that many patients already use the technology. A recent report prepared on behalf of the Agency for Healthcare Research and Quality (AHRQ) found that patients are less likely to use interactive systems that require new equipment or technology that does not fit seamlessly into their normal daily routines.⁸

The every-day use technologies deliver support with varying levels of technology sophistication and patient-specific customization, depending upon the program and technology venue employed.

1. *Content* – Information specific to the health management objective. For example, tips for quitting smoking, diets, first aid advice
2. *Customized content* – Information specific to the service and individual. For example, personalized meal plans, medication schedule, or exercise regimen
3. *Push messages* in the form of reminders and motivational messages and alerts from care providers when input data indicates a clinical problem
4. *Data Capture* – Record activity data such as food choices, fitness activities, vital signs, patient information for the personal health record (PHR)
5. *Interactive services* – Advice and recommendations such as food selections, location of closest ER, direct communication with care professionals

Representative solutions are listed in the following table, along with the supporting technologies:

Solution (vendor, product and use)	Technology Base
iNew Leaf – fitness monitoring.	iPhone
Siemens – automated fitness instructor, fitness calculators, monitors.	Cell phone
Digital Cyclone and Mayo Clinic solution that provides first aid tips, self-care guidelines for common symptoms, health news videos, ER and urgent care locator.	Cell phone (with GPS for location services)
Food Phone – diet management with access to dieticians.	Cell phone
Sensei Weight Loss – sponsored by Humana.	iPhone, iTouch, Cell phone, Blackberry
STOMP – smoking cessation application that sends motivational messages.	Cell phone
PHR solutions: Wide range of employer, health plan, provider and IT vendor options to store patient data and allow access by selected care team members. The BC/CS of Northern PA-sponsored PHR is accessible via cell phone and includes diagnoses, medications and immunizations.	Cell phone, PDA, PC
Health maintenance and chronic condition websites provide patients with educational, self-care tools, and a communication vehicle with other patients (e.g., Patientslikeme.com). These are offered by health plans, providers and chronic disease and other healthcare-related associations.	PC
Second Life virtual world healthcare applications that connect patients and caregivers for support and to share information. Representative health programs using Second Life include: <ul style="list-style-type: none"> • University of Houston's Obesity Research Center for weight monitoring and counseling • CIGNA Nutrition Zone for healthy eating habits • Mass General Hospital Benson-Henry Institute of Mind Body Medicine for stress management 	Laptop or desktop with Internet access



Since preventive care and healthy lifestyles can lead to lower healthcare system costs and decrease the number of sick days at work, employers are also actively driving efforts to encourage health maintenance self-care practices. For example, Rockford Acromatic, a manufacturing company in Illinois, uses Tangerine Wellness to offer its employees an incentive-based weight loss and management solution. Participants use Tangerine’s free online tools to track diet and exercise habits, monitor progress and connect with other participating employees. The program saves the organization about 10 percent or a net \$50 – 60,000 in healthcare costs per year, including the cost of the incentives and the program.⁹

Medical Device Technologies

Medical device technologies for self-management, both commercial products and home-grown solutions, focus on long-term health and disease monitoring and treatment compliance for patients with chronic conditions and the elderly. These personal, in-home technology solutions collect data from a variety of connected sources such as a bathroom scale, blood pressure monitor, peak flow monitor, glucose monitor, insulin pump, digital spirometers and many of the devices described in the Patient Technologies section.

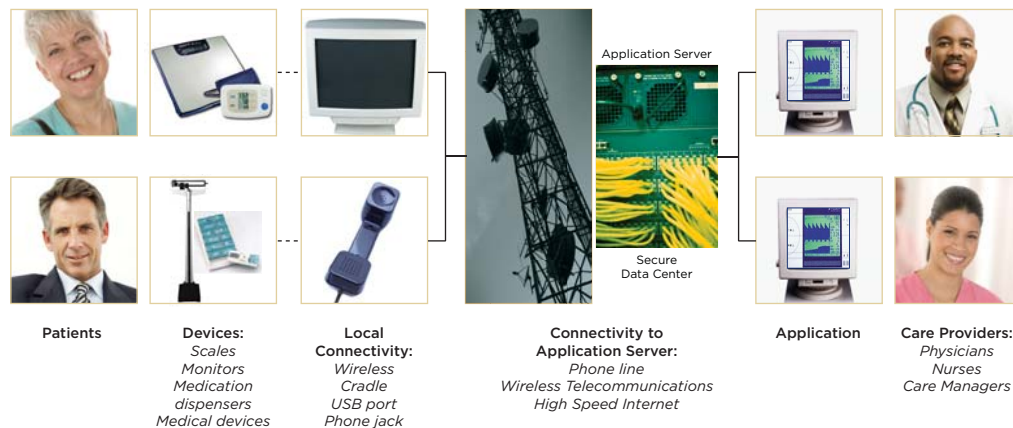


Figure 1: Medical Device Self-Care Management Technology Components and Data flow

Patients use separate devices or simply access their PC to provide responses to questions about general health, vital signs, and behaviors and reminders. The Imetrikus MediCompass Connect, for example, serves as a telehealth gateway for patients to upload biometric data from a personalized mix of over 45 personal health monitoring devices. The system transfers data using a standard telephone line or Internet-enabled PC, or for those devices with the capability, connected directly to the PC. Another remote monitoring system, HealthHero Network, uses a database of approximately 40,000 question and answer trees to produce daily assessments that help patients and their caregivers effectively manage and understand their chronic disease(s). These technologies can also be used to remind the patient to complete assessments or take medications throughout the day. Data are sent to a central data center and available to care management providers who continually monitor findings and initiate interventions as needed.

Second Life is a virtual world developed by Linden Lab that launched on June 23, 2003 and is accessible via the Internet. Users, called Residents, interact with each other through avatars. Residents can explore, meet other residents, socialize, participate in individual and group activities, and create and trade virtual property and services with one another, or travel throughout the world. Recently physician researchers have been studying the use of Second Life as a means to reach patients who might otherwise be missed, to conduct research studies, and to educate patients and care providers.¹⁰

Other representative vendor products are summarized in the following table:

Vendor	Applications	Services/Connectivity	Sites
Intel	<ul style="list-style-type: none"> Health Guide provides video and audio communications, vital sign collection, patient reminders and multimedia tutorials Health Care Management Suite is an online interface that allows clinicians to remotely monitor patients 	Patients participate in interactive health sessions and use Health Guide to measure vital signs, respond to health assessment questions, receive educational material, and complete surveys. Clinicians access patient data through the web-based interface (Health Care Management Suite).	<ul style="list-style-type: none"> Advanced Warning Systems (AWS) Aetna Erickson Retirement Communities Providence Medical Group (OR) SCAN Health Plan
INRange Systems	Electronic Medication Management Assistant (EMMA) in-home medication dispensing device.	Internet connection to pharmacist or physician to remotely manage prescriptions and receive confirmation that the medication was taken by patient.	<ul style="list-style-type: none"> Brooke Army Medical Center Walter Reed Army Medical Center
InforMedix	Med-e-Monitor provides reminders for up to 25 medications. Medication doses taken on time, missed doses, unscheduled doses, and health status information are recorded by the portable pillbox.	Pill box cradle connected to PC sends data to secure servers.	<ul style="list-style-type: none"> University of Pennsylvania Health System Enhanced Care Initiatives Auburn University's Harrison School of Pharmacy St. Vincent Healthcare Foundation (MT)

Most solutions are just passing the pilot stage with documented success and are ready for broader adoption. Recent examples include two in-house developed solutions:

- Presbyterian Home Healthcare, part of an integrated health delivery system in New Mexico, created the Enhanced Home Health Program to provide home visits and telemedicine monitoring services for chronically ill patients in remote areas. The program resulted in a decreased hospitalization rate among CHF patients (from 19 percent in 2007 to 12.2 percent in the first quarter of 2008), and an estimated \$4,900 to \$8,000 is saved for each CHF hospitalization that is prevented, benefiting the health system overall¹¹
- Center for Connected Health, a division of Partners Health Care in Massachusetts, uses remote monitoring technology, sensors and online communications to ensure compliance for discharged patients. This group recently conducted a study of the effect of remote monitoring on patients with heart failure at Massachusetts General Hospital. Results showed that patients in the remote monitoring group experienced lower average re-admissions (31 re-admissions per 100 patients) compared to those in usual care (45 per 100 patients). Patient satisfaction also improved among the remote monitoring group¹²

The Digital Medical Home

Not to be confused with the Medical Home care model, the digital medical home or smart medical home is a technology-equipped house that makes independent living possible for elderly or infirmed patients. These homes offer multi-level monitor systems using visual, sound and motion sensors that collect patient data without the awareness of the person being monitored. All sensor devices are connected to a home local area network, which is connected to a home computer. A key application on the home computer is the patient's electronic personal health record (PHR) that stores all information to provide a total health picture. Patient information is also transmitted through the Internet to the patient's professional caregivers (e.g., nurses, nurse aides, service coordinators, elder care managers) and potentially to the patient's informal caregivers such as family members and friends who provide assistance.

A two-year-study launched by researchers at Quinnipiac University will examine whether integrated sensor technology can reduce, eliminate or delay hospitalization, nursing home admission or emergency room visits by providing early detection of incidents or potential incidents that might lead to harm.¹³

Though the digital medical home is still in the lab stage or in limited pilots, it has been successful in proof-of-technology trials that show the long-term potential of using technology for patient self-management.

A European Union (EU) funded research project called HeartCycle began in March 2008 and will continue for four years. The HeartCycle consortium is made up of public and private partners from 18 research, academic, industrial and medication organizations from nine European countries and China. The goal is to "improve the quality of care for coronary heart disease and heart failure patients by developing systems for monitoring their condition at home and involving them in the daily management of their disease." These technologies will include sensors built into clothing and bed sheets and home appliances such as scales and blood pressure monitors. Custom software developed for this effort will analyze the gathered data and provide feedback on health status, adherence to prescribed therapies, and progress towards achieving goals. The system will also report relevant data to clinicians so they can prescribe personalized therapies and recommend lifestyle changes.¹⁴

ECG Chair or Bed

Electrodes fixed on a chair or in the bed that can obtain ECG waveforms without direct contact with the skin. Bluetooth interface sends results to home computer.

Wireless Sensors

Regulate house temperatures, lights and appliances, and detect motion.



Wrist Device

RFID and sensors to collect vital signs and monitor physical activity.



Image Detectors in Mirror

Detects changes in skin temperature or condition that can be used to remotely monitor wound care, for example. Image sensors allow the medical home network to know user status, and analyze and respond to events.



Smart Floor

Floor sensors collect information on movement such as walking speed and level of mobility. The pressure sensors also detect falls which automatically activates an alarm.

Figure 2: Technology Solutions for the Digital Medical Home

Accelerating the Pace

Patient self-care management works and technology can make significant contributions in personalizing support to the patient, making it accessible and enhancing the collaboration between patients and clinicians. Individual programs have demonstrated sustained cost savings in terms of fewer hospital admissions, re-admissions and physician office visits. Some have also demonstrated improved provider and patient satisfaction, and improvements in patient health outcomes and quality of life. For example, a two-year California Healthcare Foundation (CHCF) initiative that focused on helping healthcare organizations organize diabetes self-management programs demonstrated positive trends in terms of both provider and patient satisfaction levels.¹⁵ In addition, findings in a study of Veterans Administration patients with heart failure suggested that self-management along with education provided by physicians leads to improvements in patients' health.¹⁶

Overall adoption is growing, but slowly. To accelerate the pace there needs to be a shift from targeted to more integrated self-care directed programs to meet the ultimate goal of sustaining good health. The shift presents a challenge to all stakeholders — patients, providers, payers and employers. To actively manage all of the patient's conditions and care requirements over time requires stakeholders to support a coordinated community level system of care that provides program options that match the patient's care need with the right mix of services and supporting technologies, and with the right incentives. This assumes that the issue of sharing patient information across disparate systems is addressed through the adoption of national data interoperability standards.

Though widespread healthcare reform is needed to reach the full potential offered by technology-supported programs encouraging patient self-management, the next stage of self-care evolution has identified critical success factors:

1. *Patients and families* continue to have a growing interest in attaining and maintaining good health and are more active in care management. In addition to better health, patients are being rewarded for their new roles by health plans and employers alike. Clearly, incentives are needed in parallel with education about what is possible and why it is important.
2. *Organized programs supporting self-management* are essential. Care programs or systems of care continue to break down traditional care delivery silos by developing stronger operational partnerships across payers, hospitals, providers and employers. New programs will be sponsored by several stakeholders because they all benefit. As these proliferate, expect changes in reimbursement to reward program health outcomes, moving significantly beyond the pay for reporting, pay for performance and pay for quality measures benchmarks currently in place.
3. *Primary care providers (PCPs)* and members of their team need to be the central resource to help patients navigate the possibilities for self-care management program options, especially those that involve ongoing chronic disease monitoring and overall management. Together the patient and the primary care provider will develop a self-care plan that will be directed by the patient and monitored by both. We predict that PCPs and other care providers will focus initial self-care efforts on patients with multiple chronic illnesses since effective management of these cases will require the most active levels of patient involvement and self-management, and are costly to support in the current care model.
4. *Technology* will play an increasingly significant role to connect the patient with the appropriate care resources, to send vital patient data and to alert providers when interventions are needed. Technology is not a one-size fits all solution. Depending on the care situation and health management challenges and the patient's technology savvy, programs will need to provide a range of technology-assisted and care provider-assisted services and options.

Of all the stakeholders, the patient is by far the most critical to success. Patients must be committed to good health and act as both the provider of care and the key collaborator with the primary care physician, participating in self-care programs and adhering to customized care plans.

“Single payer and closed systems such as Canada and Kaiser Permanente immediately recognize the need and value of patient self-care management supported by technology — since they are responsible for a patient from the “cradle to the grave.”

Dianne Begin, SVP of Customer Solutions, Imetrikus

“A promising aspect of interactive consumer health IT is the potential to engage and support consumers in their own care by integrating their health information needs and preferences into information systems ... It is important to understand whether and how populations such as the elderly, chronically ill, and underserved populations will be able to access, use, and benefit from health IT.”¹⁷

Bottom Line

As a result of many successfully implemented and executed patient self-care programs, the healthcare industry is currently at a stage of knowing that organized programs are effective and valuable. The concept of patient self-care may simply seem like an interesting topic to begin thinking about, but in actuality it is mandatory that patients (and their families) take more responsibility in managing their own care starting now. Technology will clearly play a major role as an enabler that enhances implementation and widespread adoption of lower cost, personalized patient self-care. However, translating pilot programs into a financially sustainable, widely adopted process of care will happen only when there is coordination and aligned incentives across payers, providers, employers and patients

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About CSC

The mission of CSC is to be a global leader in providing technology enabled business solutions and services.

With the broadest range of capabilities, CSC offers clients the solutions they need to manage complexity, focus on core businesses, collaborate with partners and clients, and improve operations.

CSC makes a special point of understanding its clients and provides experts with real-world experience to work with them. CSC is vendor-independent, delivering solutions that best meet each client's unique requirements.

For 50 years, clients in industries and governments worldwide have trusted CSC with their business process and information systems outsourcing, systems integration and consulting needs.

The company trades on the New York Stock Exchange under the symbol "CSC."