LifeWatch Corp.
Executive Healthcare Management

Wireless Remote Patient Monitoring Systems Improves Clinical Outcomes and Is Cost-Effective

New tele-diagnostic monitoring systems with Cellular, Internet and Wireless communication technologies are set to transform the healthcare industry. By offering real-time remote Disease Management to patients in the home, Tele-Diagnostic systems will enhance patient compliance programs, improve clinical outcomes and reduce unnecessary hospitalizations and emergency room visits.

Healthcare providers are under increasing pressure to reduce costs while providing technologies and services that can improve a patient's experience and clinical outcome. The ageing U.S. population (over thirty-five million Americans are over 65 years of age) with increasingly longer life expectancies together with the growing prevalence of chronic illness (e.g. cardiovascular diseases, respiratory diseases and diabetes) has created a demand for out-patient and disease management solutions and monitoring services for patients in the home.

Cardiovascular Disease
The American Heart Association (AHA) estimates that one in three American adults (80.7 million) have one or more types of the following cardiovascular diseases (CVD).

- High blood pressure (HBP)—73 million. (Defined as systolic pressure of 140 mm Hg or greater and/or diastolic pressure of 90 mm Hg or greater, taking antihypertensive medication or being told at least twice by a physician or other health professional that you have high blood pressure.)
- Coronary heart disease (CHD)—16 million
- Myocardial infarction (MI, or heart attack)—.1 million
- Angina pectoris (AP, or chest pain)—9.1 million
- Heart failure (HF)—5.3 million
- Stroke—5.8 million

In 2005, Cardiovascular Disease was the top disease category for all hospital discharges in the U.S., registering over 6.29 million patients. A further 4 million emergency room visits and 6.7 million outpatient department visits had a primary diagnosis of CVD. The AHA estimates that the direct and indirect cost of CVD in the U.S. will reach $448.5 billion in 2008.

Diabetes
More than thirty-five million Americans are diagnosed with diabetes. In 2007, the healthcare costs associated with diabetes reached an estimated $116 billion, out of which approximately $58

billion was used to treat diabetes-related chronic complications which resulted in hospitalizations. The average hospitalization costs due to diabetes are between $1,853 and $2,281 per day. Although diabetes can lead to serious complications, diabetics can reduce these complications by controlling blood glucose, blood pressure, and blood lipids. Most type 2 diabetics can control their blood glucose by following a healthy diet and exercise program, and taking oral medication. Many diabetics must also control their cholesterol and blood pressure with medications. By implementing self-management through self-care behaviors, such as a healthy diet, exercise, and monitoring blood glucose, diabetics can improve their health outcomes and quality of life.

Hospital Overload

Most U.S. hospitals and medical institutions offer exceptional inpatient treatment for chronic disease, yet they lack daily interaction with their patients following hospital discharge. One study demonstrated that the average patient progressively deteriorated (unmonitored) for five days before seeking emergency treatment.(Fonarow, GC, Heart Failure Society of America, 5th Annual Meeting, Washington, DC. 2001,Vol.1, #3)

The enormity of the costs associated with hospitalizations and ER admissions for chronically ill individuals has compelled many payors to enforce "pay-for-performance" benchmarks to healthcare providers. Pay for performance (PFP) programs sponsored by CMS and Bridges to Excellence among others, propose to raise the bar on healthcare quality, accountability, access and outcomes in order to reduce unnecessary healthcare costs. In some cases, providers will not be paid for the hospitalization costs associated with a patient who is re-admitted to the facility within 60 days of discharge. As a result, many healthcare providers are actively seeking the most cost-effective tools to educate and monitor their patients upon discharge. Not surprisingly, the most cost-effective solutions are remote patient monitoring systems that include clinical support systems and easy-to-use monitoring platforms.

LifeWatch PMP^4 Wireless Healthcare System

LifeWatch Corp., a leading healthcare company based in Rosemont, IL, offers both state-of-the-art monitoring technologies and cardiac arrhythmia monitoring services to healthcare providers through its wholly owned subsidiaries. The company has over 39 years of experience in the telemedicine market, and is the pioneer of tele-cardiology solutions.

LifeWatch and its sister company Card Guard Scientific Survival, Ltd., have developed a state of the art vital signs monitoring system which incorporate many key features of the PMP^4 wireless healthcare system currently in operations outside of the U.S.

The PMP^4 wireless healthcare system enables 24/7 remote patient monitoring from any location. The system utilizes Cellular, Land line, Bluetooth, Satellite, and Internet technologies, video conferencing, multiple communication portals such as touch screen, PC, laptop and PDA with "Plug and Play" functionality, dedicated web-based software and easy-to-use medical monitors. The PMP^4 offers two distinct monitoring solutions that address the different needs of the caregiver and the patient.

In 2008, LifeWatch piloted the PMP^4 wireless healthcare monitoring system at a leading U.S. medical center. The simplistic design and user interface ensures that even the most technologically-challenged individuals can easily engage in disease management for improved clinical out-

comes. This portable monitoring system may be initially utilized at the patient's bedside in the hospital in order to train the patient on its functionality and to perform baseline measurements with the medical monitors. Upon hospital discharge, the PMP^4 system is sent home with the patient for a defined follow up screening period. The device software is custom programmed for each patient on their individual monitoring protocols and provides alerts when the individual thresholds are breeched, such as a weight gain, or higher blood pressure measurements. The PMP^4 system also provides medication reminders and other disease-specific education.

The PMP^4 medical monitors include 1 and 12-lead ECGs, a Spirometer, blood glucose meter, blood pressure monitor, pulse Oximeter, weighing scales, and a fetal maternal monitor. Each medical monitor communicates via Bluetooth technology to a smart screen, laptop, PC or cellular / or land line phone, and then transmits the data to a secure web-enabled data server for remote viewing, storage, and report interpretation by a caregiver or call center. The PMP^4 system provides Customizable Condition Management programs for true Holistic Disease Management. Utilization of the system can improve a patient's clinical outcome, enhance quality of life and reduce the costs of care through reduced hospital stays.

In practice

Outside of the U.S., the wireless healthcare system has been installed in several locations around the world.

The Metropolitan, a large private hospital in Athens, Greece, uses the PMP^4 system for monitoring cardiac patients at home. The patients conduct their own ECG, blood pressure and pulse Oximeter tests and transmit the data to the medical centre in Athens for analysis and follow-up treatment. The monitoring program enhances patient compliance, leading to improved clinical outcomes and reduced healthcare costs. Another facet of this program in the Thessalonica area allows patients being treated by regional clinics to send their physiological measurements to the same medical centre in Athens. A second program provides wireless monitoring on several Greek islands, with the purpose of providing better medical services to the islands' remote communities and tourist industry. Local physicians on each island utilize the remote monitoring solution when required, and a patient's physiological data is sent to medical specialists at a hospital located in Athens for analysis and follow-up treatment.

Conclusion

Web-enabled telemedicine monitoring technologies will enable healthcare providers to actively engage their patients in managing their health condition. Real-time educational and screening tools that can monitor medication, diet and exercise programs will improve quality of life, strengthen patient-physician communications and avoid non-compliance issues. The value can be demonstrated through improved clinical outcomes resulting in lower healthcare costs from reduced hospital admissions and emergency room visits.