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### The European Patient Monitoring Market :Life-Saving Technology Evolving at a Rapid Pace

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Patient monitoring is vital to many aspects of healthcare, in operating rooms, intensive care and critical care units as well as step-down units. Products vary from specialised single-parameter instruments to monitors with the ability to measure multiple parameters and interface with other devices. This article reviews the current status and likely development of the market for patient monitoring devices, and their potential positive impact on cost-effectiveness ratios with regards to patient treatment.

#### Market Potential not Yet Reached

While the demand for patient monitoring solutions is already quite considerable, the market potential has remained largely untapped until now. Hospitals across the world are battling challenges such as budgetary constraints and are struggling to raise funds for capital investment for infrastructural development and various information technology-related products. Their priorities are likely to focus more towards maintaining service rather than investing in infrastructural development. Budget constrained hospitals are delaying the replacement of various patient-monitoring devices. More and more orders are cancelled by European hospitals, because they are not critically required and the hospitals' ability to borrow is severely constrained. Nine out of ten hospitals in Europe are finding it increasingly difficult to access tax-exempt bonds.

#### Remote Patient Monitoring: The Future

Remote patient monitoring (RM) is the fastest growing category within the global patient monitoring market, with a growth rate of 7.4 per cent between 2005 and 2009 and is expected to grow by 11.0 per cent between 2009 and 2012. RPM solutions are being increasingly recognised as valuable tools for enhancing quality care in chronic disease management. However, it is not only confined to remote monitoring of chronic diseases. RPM also includes a broad spectrum of activity monitoring. The solutions allow healthcare providers, family members or caretakers to measure the physical activities of elderly patients, either actively or passively.

The sensors worn by the individuals record the patients' vital signs and motor functions. The measurements are then transmitted wirelessly and in real time. RPM systems also consist of motion sensors, which sense a person's presence in a room installed with motion detectors, such as infrared, light, magnetic and temperature sensors. These systems are equipped with alarms to signal unusual behaviour.

#### Alternative Financial Solutions

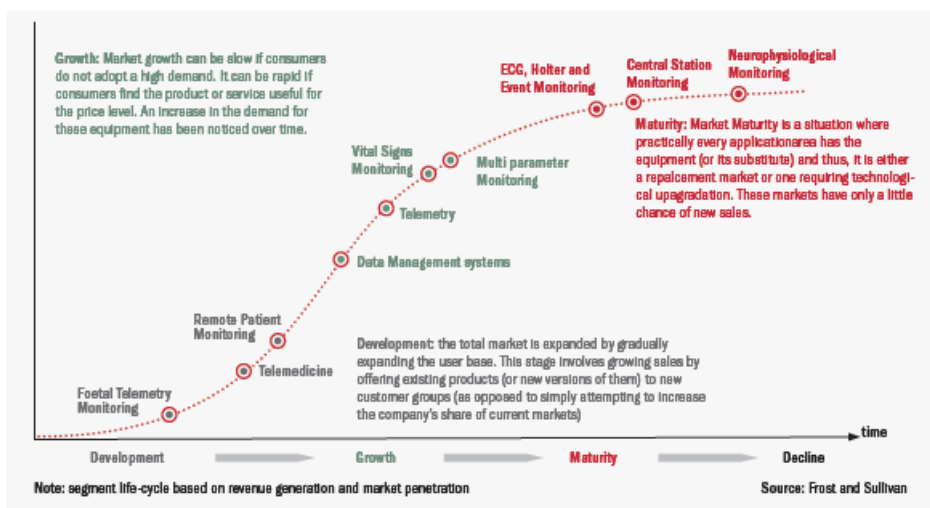
Certain factors, both economic and political, clearly influence short-term prospects for the successful development of technological innovations such as RPM. It is essential that companies evolve strategies to face inevitable challenges. Companies involved in patient monitoring have come a long way in building up a healthcare portfolio, which is needed to improve and extend the lives of millions of patients. Companies have also realised that despite economic slowdowns, to survive in a mature market, there is an ongoing need for innovation.

Healthcare providers are increasingly under pressure to provide high quality healthcare and, at the same time, adhere to high levels of cost containment. Medical equipment suppliers are under equal pressure to introduce and sell technologically sound devices. Keeping this in mind, alternative financial solutions were created to encourage the uptake of capital-intensive patient monitoring equipment.

One example is the managed services programme currently offered by Philips Healthcare. Recently, the company signed a ten-year agreement to manage the imaging technology needs (including maintenance, upgrades and replacements) of the Hospital de la Santa Creu i Sant Pau's medical imaging and monitoring capabilities at a fixed monthly rate.

Others within the patient monitoring space have also developed separate financial operations, whilst some offer working capital and installment loans; the focus of the majority of these operations is on leasing contract. These solutions further strengthen the expanding role of public-private partnership initiatives that are deemed to be of great importance across the healthcare sector.

Alternative financial solutions ensure that the hospitals and clinicians are equipped with solutions that cater to patients' needs without having to incur high initial expenditure. GE Healthcare has recently come up with investment solutions by funding companies with promising technologies and business models. GE's six-billion dollar 'Healthymagination' fund provides prospective emerging companies a platform to shape the future of healthcare.



## Future Outlook

One of the main elements that prohibits a more rapid growth in the market, is that the patient monitoring market is facing severe stress with regards to its ability to provide interconnectivity. There is an increasing demand for devices that, while they are ready technologically, may suffer from a lack of connectivity between different devices. An innovative unification of standards between clinical information systems and patient monitors will enable monitoring and recording of patient data.

Patient monitoring devices are likely to be increasingly used not only in critical care units but also in general wards (two to five years uptake period). Skylight HC Systems has successfully ventured into interactive bedside systems using an innovative digital communication platform. It has revolutionised care by turning the hospital TV set into an interactive information and communication network enhancing care continuum for patients. It is expected that these interactive bedside systems are likely to be upgraded with multiparameter patient monitoring devices.

At the same time, wireless patient monitoring technologies are gaining momentum. A number of medical device and mobile handset companies are beginning to invest in telehealth and related services. Mobile handset companies such as Apple are hopping on to the healthcare bandwagon by introducing Bluetooth enabled applications which enable the user to monitor their blood pressure and glucose levels. Similarly, Wireless Body Area Networks (WBAN) is expected to revolutionise patient monitoring. MBAN consists of a set of mobile and compact intercommunicating sensors, either wearable or implanted into the human body, which monitor vital body parameters and movements. The Federal Communications Commission has proposed to allocate the radiofrequency spectrum and establish service and technical rules for MBAN systems. If approved, MBANs would help eliminate the need for hardwired, patient-attached cables used by current monitoring technologies making the devices cheaper.

Philips Healthcare's R&D unit has constructed a prototype of iPill (intelligent Pill) capsule and system, which is one of its latest innovations and has not yet been achieved by any of its competitors. The pill is an 11-by-26-millimeter capsule packed with tiny sensors, a microprocessor, a fluid pump, a wireless transmitter, and medication. It can be ingested just like any other conventional pill. As the iPill makes its way through the digestive tract, the wireless transmitter communicates information about both pH levels and temperature to an external receiver unit, providing doctors with the patient's internal information. The device will allow doctors to deliver drugs directly to a specific area of the gastrointestinal tract, which could help treat illnesses. The launch of iPill in the market will substantially change the existing dynamics within the patient monitoring market.

## Conclusion

Patient monitoring companies have, over the years, combined clinical expertise with customer insights to develop meaningful innovation that will ultimately contribute towards improved patients' lives and quality of care. While a particular new technology may either increase or decrease healthcare spending, it is generally agreed that advances in medical technology have always contributed to rising overall healthcare spending.

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