



Investing in Saving Patients' Lives

New technologies are making the hospital a safer place

by Edward L. Cahill, Partner, HLM Venture Partners, Boston

One of the most encouraging things I've observed in my work as both a venture capitalist specializing in health care companies and as Chairman of the Patient Safety Committee at Johns Hopkins Hospital's Board of Trustees is the intense focus among health care providers and business entrepreneurs alike on improving patient safety by reducing medical errors.

According to the Institute of Medicine, some 98,000 preventable deaths occur each year as a result of hospital-related infections and medical errors. Many believe this is a conservative estimate. Fortunately, new technologies are being created by entrepreneurs with the aim of reversing this dangerous trend. Investing in companies that improve quality of care and patient safety is an important theme at HLM Venture Partners. Numerous examples of new technologies exist, but a few worth noting include the following:

Reducing the risk of anesthesia

General anesthesia created a significant risk for surgery patients as recently as ten years ago, but is now a much smaller risk due to new technology and new protocols.

One of the most ubiquitous devices in today's hospitals is the pulse oximeter, which clips onto a patient's finger and gives the anesthesiologist a continuous reading of the blood oxygen level – an instantaneous measure of the patient's respiratory function. The pulse oximeter has been a major factor in reducing the risk of anesthesia and is soon to be enhanced even further.

A company on the West Coast, Masimo Corporation, in the mid-1990s introduced a new breakthrough that substantially advanced the state-of-the-art in oximetry, creating the first oximeter which works well with at-risk newborn infants and circulation-compromised elderly, two of the most vulnerable groups in our health care system. Now, its pulse oximeters are considered the 'gold standard' in leading hospitals around the world. In February 2008, Masimo added another innovation to the field -- the first pulse oximeter which will continuously and non-invasively alert the surgeon or intensive care unit (ICU) physician if a patient may be hemorrhaging internally. Masimo went public in 2007 in what was one of the best performing IPOs of the year and a boon for early investors in the company.

More accurate administration of drugs

The largest category of hospital errors relates to pharmaceuticals administration. Patients are prescribed many more drugs today than they were twenty years ago, resulting in a much greater chance that they will experience dangerous drug interactions. Hospital errors typically result from a failure to anticipate adverse drug interactions or from administration of the wrong drug or the wrong dose. Even if a hospital's rate of human error is extremely low, the sheer volume of drug administrations increases the chances of a problem arising due to drug interactions.

Automated Healthcare was founded by a young inventor/entrepreneur with venture backing (including from my own firm). The company developed the first centralized, bar-code-activated robotic systems for automatically dispensing drugs. Soon afterward, the company helped pioneer the introduction of linking drug administration with bar codes on patient wristbands, effectively eliminating the chance of giving the wrong drug to the wrong patient. Recognizing the value of these devices, McKesson Corporation, one of the largest and most successful publicly-traded health care service companies acquired Automated Healthcare, handsomely rewarding early investors in the company. Today, these drug-dispensing devices are in use in more than 1,000 U.S. hospitals where they have helped to dramatically reduce the incidence of drug-related hospital error.

Controlling blood glucose levels

One of the most exciting recent developments in patient safety has been the flood of innovative studies designed to determine which factors are actually responsible for complications arising in the hospital. Seven years ago, a groundbreaking study suggested that controlling every ICU patient's blood glucose level within a very tight range could dramatically reduce infection rates, complications and even deaths. The conclusion was considered radical at the time, but it has since gained widespread – although not universal – acceptance. The underlying explanation is that trauma and stress in the hospital cause the body to become insulin-resistant. This leads to diabetes-like symptoms, such as increased susceptibility to sepsis and other infections even in non-diabetic patients. Hospital patients are typically fed glucose through an IV tube, and many react poorly to the increased level of sugar in their blood. Some published studies

have suggested that tight control of blood sugar levels could reduce ICU mortality by as much as 25-33%.

And yet, not all hospitals have attempted to regulate blood glucose levels. One reason is the risk that if the glucose level drops too low, the patient could go into life-threatening hypoglycemic shock. Another problem is a more practical one. Hospitals currently have to monitor blood glucose levels manually. Every hour, an ICU nurse – a highly trained and highly paid professional – has to take the patient's blood, put it on a strip, measure the glucose level, record it and, if necessary, implement the right therapeutic response. This procedure is very costly for hospitals, and it is not reimbursed by insurers, Medicare or Medicaid.

HLM recently invested in IntelliDx, which we believe will be the first company to offer a device that automatically and frequently monitors a hospital patient's blood glucose level without the intervention of a nurse. This is technology that can address the shortage of nurses and lab technicians within hospitals while at the same time systematizing a brand new protocol that helps save lives.

Making doctors more efficient

One final example of a compelling investment opportunity in the improvement of patient care applies as much to the doctor's office as to the hospital setting. MedVentive, a company based in Cambridge, Massachusetts that HLM invested in, has developed a process that analyzes updated health care claims data and feeds it back to doctors, who can then see which of their patients are not in compliance with best practices. It can indicate, for example, if a patient should have a PSA test, or is due for a colonoscopy, or

a mammogram or other preventive care and automatically send the patient a personalized letter from the doctor reminding them to schedule an appointment. Before each appointment, the doctor receives a one-page printout summarizing the patient's status compared to current medical benchmarks. For today's busy doctor, technology like this saves time, and enables him or her to take a proactive, holistic approach to each patient's health.

Good ideas versus good investments

By providing these few examples, I do not mean to suggest that every desirable improvement in health care quality can be achieved through technology. Some improvements will undoubtedly require changes in the way our health care system is organized and compensated and the way our medical specialists are trained. Better teamwork and communication among health care professionals and consistent attention to established protocols would save thousands of lives annually as well.

As far as investments are concerned, good ideas do not always produce financial rewards. Only some good ideas will actually enable a young company to thrive. For a company to succeed with a new product, many factors must come together at the right time. The timing of the product launch and the way it is introduced for FDA approval is crucial. New products often need to go through a rigorous process to ensure that they will be eligible for reimbursement by insurance companies and Medicare. The competitive environment needs to be thoroughly analyzed and understood as well. All these factors and more have to be right. More than anything, we look for a strong management team to support the ideas of the scientists who are often the genius behind the germination of the product. It took Masimo years, millions of dollars and

perseverance to defeat competitive patent infringement, anti-competitive tactics and market inertia.

It is also very encouraging to see that hospitals – which often compete fiercely with each other – are eager to work together to improve patient care. I see a great deal of grassroots experimentation and innovation at hospitals and a great willingness to share best practices with colleagues and competitors in an effort to boost quality and to save patient lives. This combination of dedicated work in the field and entrepreneurialism is meeting the challenge of improving patient safety.

-- Mr. Cahill is a partner at HLM Venture Partners in Boston. In 2007, he received the Dalmarva Foundation's "Driving Quality" award for his work on improving patient care in his role as a Trustee of Johns Hopkins Health System Corporation, Johns Hopkins Medicine and as Chairman of the hospital's Patient Safety Committee. Mr. Cahill is also a director of Masimo Corporation, Guava Technologies and Phreesia, Inc., a trustee of Mercy Health Services and was formerly a director of Automated Healthcare.