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INFORMATION TECHNOLOGY

Prescription for Change

Health care has managed to avoid the information-technology revolution. But it won't for much longer.

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The health-care industry is about to undergo a global revolution driven by a force it can no longer resist: information technology.

While hospitals and other care providers have long been quick to adopt breakthrough technology in medical devices, procedures and treatments, far less attention has focused on innovations in networking and communications.

This is partly because of concerns about breaches in security and patient privacy, and because health care until recently was a service always performed locally, and in person. Big computer networks and the core benefits they offer -- such as increased group productivity and access to data -- weren't on the health-care sector's radar screen.

But that is about to change. IT security will eventually meet the expectations of the health-care industry, just as has happened in other sectors, like banking. And when it does, powerful IT networks crisscrossing the globe will change the way much of health care is delivered: Outsourcing and offshoring of medical and nonmedical services will increase, providing more efficient health care at the most cost-effective rates; systems integrations will allow more medical records to be transferred swiftly and securely; efforts to monitor the safety of medicines will gain global access to data; and professionals and patients will find authoritative and up-to-date information on every specialty online.

In the future, there will be three often overlapping modes of delivering health-care services: services performed in person by humans, services that can be performed by people at a remote location, and services performed by computers without direct human involvement. Offshore outsourcing in combination with a 24-hour work cycle will be appropriate when certain conditions are met -- mainly, if the information involved in the task can be digitized, and if workers at different sites can do their jobs independently from one another.

These changes won't come quickly. There will be plenty of obstacles as institutions and networks reach across borders and encounter different laws as well as technical standards. Licensing, accreditation and accounting issues will

arise as well. But eventually all such issues can be resolved by proper regulatory structures and market forces.

In the meantime, health-care organizations that don't join in the coming changes will incur higher costs and less integration. This will make them less competitive in the global health-care marketplace, just as is happening with companies that have resisted outsourcing and systems integration in other sectors.

What follows is a look at four major ways in which IT will revolutionize health care: more offshore services, integration of health-information systems, drug-safety monitoring on a global scale, and more high-quality information to doctors and patients.

The Offshore Doctor Will See You Now

The most noticeable changes will be the offshore outsourcing of diagnostic services -- particularly imaging, such as X-rays and mammograms -- and consultations by specialists.

Doctors in the U.S. and other countries have long practiced variations of telemedicine to provide care to patients in hard-to-reach and underserved locations. But in the future, telemedicine will be practiced more as a way of distributing work loads and lowering costs. Teleradiology in particular, in which X-rays are taken at one location and then transmitted to doctors at another site, appears ripe for expansion.

Forces driving the growth of teleradiology include a significant shortage of radiologists, aging populations and more use of imaging in trauma situations, which in turn has fueled a need for 24-hour radiological services in emergency rooms.

With robust IT networks, a single radiologist can support multiple hospitals, or large hospitals can serve as central image-reading sites, spreading the work among a staff of radiologists. Remote sites can be set up with just imaging equipment and technicians, extending radiology services to underserved regions. Offshore outsourcing, meanwhile, can mean that images taken in the middle of the night are still read right away by a wide-awake radiologist working at the height of his or her powers.

The biggest hurdles to the expansion of teleradiology may be the credentialing and billing processes. While many countries will give a doctor a license to practice anywhere in that nation, the practice in the U.S. is to issue licenses at a state level. This creates more bureaucracy. Most states require medical professionals to be U.S. citizens or legal residents in order to be licensed. Also, it is difficult for doctors abroad to get reimbursement from insurance companies in the U.S. for telemedicine services.

Another reason to outsource more medical services abroad: The World Health Organization and the American Cancer Society have identified working at night as a possible cause of cancer. Such a finding may help fuel efforts to wean medical workers from graveyard shifts. Video cameras and other equipment can

monitor sleeping hospital patients in other cities, states or countries. Similarly, sleep studies, in which the patient is observed for a full night at a sleep center, can base patients in one country and technicians in another. If the patient develops unusual symptoms, medical personnel can be summoned on the scene.

Over time, the offshore outsourcing of more medical services will benefit developed countries because it can provide faster diagnosis and lower overall costs. Offshore outsourcing also can benefit developing nations, by giving patients more access to expert health care. However, there is a shortage of medical professionals both in developed and developing countries, and the diversion of such resources to foreign patients can potentially aggravate the shortage. These issues, and others, will be partly resolved by market forces.

Medical Records That Travel Well

Globally integrated health-information systems are evolving, along with standardized formats for patient records -- making the charts easier to translate.

A detailed medical history can be critical if a person suffers an illness or accident far from home. Integrated information systems and records that translate easily would be of enormous help in natural disasters and other mass-casualty situations in which the victims come from many different places.

But current hospital information systems were designed to function as islands with their own rules and formats, making a patient's file at one hospital difficult for another to read. Not only are different languages and measures sometimes used, but conflicts between encryption and other software can make it impossible for systems to exchange data electronically.

Computer programs and Internet technology will play big roles in overcoming such obstacles. But experts in IT and medicine will also be indispensable at every stage, whether for building the tools for integration or assisting in specific records transfers.

Hospitals and other health-care organizations in the U.S. have started to make a dent in this area, using domestic medical and IT personnel to develop systems for the electronic exchange of medical records. But so much remains to be done, the higher cost and relative scarcity of U.S. labor available for this work is most likely to lead the industry to outsourcing abroad.

Meanwhile, a precedent already exists for fast and secure international transmissions of U.S. medical records. U.S. hospitals and doctors increasingly rely on workers abroad to transcribe audio recordings into written notes. Typically, the audio recording will be sent in the evening, U.S. time, to transcriptionists in India, for whom it is morning. A written version of the recording is then available to the doctor over the Web before the next day shift begins in the U.S.

Monitoring Drug Safety Around the World

As people become more mobile, an international database on drug safety will be

created.

Various programs currently do this kind of work in their home countries, including MedWatch, an initiative of the U.S. Food and Drug Administration that investigates and reports on adverse drug reactions and other safety issues involving medical products. MedWatch gets reports from a wide network of domestic sources, including pharmacy companies, insurers and professional associations in the medical, dentistry and nursing fields. But no agency routinely collects and shares information between countries. So, incidents involving medicines purchased abroad can fall through the cracks. This is a growing concern in the U.S. not only because people are traveling more, but also because U.S. residents increasingly purchase prescription drugs from pharmacies in Canada and other countries because of lower prices.

A possible prototype for a global watchdog already exists, designed by researchers from the University of Arizona for the Critical Path Institute. Co-founded by the FDA, C-Path is a nonprofit based in Tucson, Ariz., and Rockville, Md., that researches areas related to drug development and safety. The prototype envisions a network that would connect and share data among multiple organizations including: companies or groups that tested or helped produce the drug; the FDA and equivalent agencies in other countries; and the doctor or organization that prescribed the medication. Individual pharmacies, too, would participate directly -- a critical contribution, since they have the information about buyers, dates and quantities.

Serious challenges to this vision exist, such as different reporting procedures in various countries, and potential conflicts in software and Web protocols. The technical conflicts can be solved over time by IT experts working toward standardization. As with systems-integration challenges, costs and labor shortages will drive the use of offshore labor.

Meanwhile, with the right infrastructure and incentives, pharmacists and pharmacy technicians could replace the current hodgepodge of reporting methods by becoming designated agents for collecting raw information on patients' medication histories, including adverse reactions.

More Sharing of Medical Knowledge

The latest medical knowledge will appear on Web sites edited by eminent specialists in those fields.

Doctors and scientists from around the world will contribute material, and automated search tools will capture updates from, say, a trusted clinical study. The reliance on IT and editorial workers in less-expensive countries, meanwhile, will help make such endeavors more economically viable.

Such sites are likely to take shape as hybrids of information sources and tools, drawing from online textbooks, medical journals, wiki-style editing and automatic updates from various trusted data sources. While the sites will have human editors, developers are working on tools to help comb through the large

number of newly published and potentially relevant articles that need to be considered each week. The goal will be not just to increase the amount of medical information at people's fingertips, but also to make it specific, up-to-date, reliable and easier to find.

The detailed nature of this kind of work, and competitive cost pressures, will mean that a mix of medical and IT professionals will have to be employed both in the U.S. and abroad.

The eventual benefits, meanwhile -- from all of the advances predicted -- will be universal.

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