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## **Medical technology**

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Even Michael Moore would be pleased. Despite the well-documented woes of the American system of health, one problem area is progressing rapidly toward solution, both nationally and here on the Treasure Coast. After drowning in printed documents for years, the paperless medical facility is either already here or on the drawing boards at area hospitals and medical practices. Imagine a world in which all your prescriptions, test results, doctor's notes, even your most recent X-ray or MRI images are stored electronically. If you need medical attention while traveling or at your second home, medical personnel can access your records through the Internet with a password you provide. Or, you could carry your medical records on a compact disc or plug-in device for use on any computer. That world is now reality for many. Here's a look at how the move from paper to electronic systems is taking place at a leading physician practice group and two hospitals.

### Heart & Family Health Institute

One of the Treasure Coast leaders is the Heart & Family Health Institute of Port St. Lucie, which has been totally paperless for more than three years. President and CEO Dr. David E. Wertheimer decided in 2002 that his system would be purchased from one company, would be integrated and paperless.

An integrated system merges the practice management (PM) function with the electronic medical record (EMR) function. Practice management handles all the business functions, including billing, collections and appointments. Electronic medical records systems track all patient records, eliminating those rows upon rows of manila folders stacked to the ceiling in most medical offices.

"When the PM and EMR systems are integrated, it's a powerful tool," Wertheimer said.

He founded the group in 1984 as a cardiology practice and expanded it into a multi-specialty group in 1989. Today, the institute consists of 25 doctors in 11 specialties and 150 employees serving more than 40,000 patients.

The group occupies 30,000 square feet of a medical building near St. Lucie Medical Center, up from 2,000 square feet when it started. The facility includes its own blood lab and the state's first free-standing heart catheterization lab.

Wertheimer bought his first computer in 1986, but the manufacturer went bankrupt and he lost his investment. That taught him to be very careful in picking technology vendors.

In 1987, he installed his first practice management system and in 1992 added a rudimentary electronic medical record system that allowed doctors to dictate notes to be entered into the computer, but still required paper charts.

So in 2002, he and his colleagues began the search for an integrated, single-source system, evaluating more than 20 vendors. They settled on NextGen, a major national provider of integrated systems.

They started implementation of the practice management portion in May 2003, entering in all business records including every patient's insurance records. The group deals with more than 500 payers, each with multiple plans.

"You can't function without an electronic system today," Wertheimer said. "It's just too much for a small group."

They ran the new system simultaneously with the old for a time until most of the outstanding insurance payments had come in, leaving just cash outstanding. Then, they shut down the old system.

Next came implementation of the clinical system, which entailed the scanning in of more than 6 million pages of medical data. Ten people worked two shifts a day on high-speed scanners. By November 2003, the office was totally paperless.

With the addition of a few other functions, the system was totally implemented by July 2004. The charts were gone.

"Paper is the bane of quality care," Wertheimer said. "Things get lost. Information transfer is challenging, whether from doctor to doctor, doctor to nurse, or medical personnel to billing. Errors occur. Only one person can look at a paper chart, while multiple people can access the electronic record simultaneously for different purposes."

The Heart & Family Health Institute has a computer station in every exam room and a total of more than 200 stations at the facility. All of the practice's physicians type their orders and notes into the computer.

The cost savings have been substantial, according to Wertheimer. All in-house and outside transcribers, who previously typed up the notes dictated by doctors, were eliminated at a savings of \$450,000 per year.

In-house employees were not laid off but reassigned to serve the fast-growing practice in other areas, saving another \$250,000 in staff that did not have to be hired. Savings in paper and supplies totaled another \$40,000. Off-site storage was axed at a savings of \$40,000 and the practice reclaimed 4,000 square feet of in-house storage space worth \$1 million.

"We changed space from clerical to clinical," Wertheimer said proudly.

The firm also introduced a practice archive and communication system, or PACS, which stores X-ray, Magnetic Resonance Imaging and computed tomography scan images electronically.

Since 98 percent of the firm's work is at St. Lucie Medical Center, the practice put a work station at the hospital so that doctors on call could access all the practice's patient records without having to go back to the office. And all doctors can access the records from home.

Today, paper coming from the outside is faxed into the system directly through a fax manager system and filed digitally. Other papers are scanned in.

The increase in speed is amazing. When a patient calls with a problem, the nurse accesses the records immediately, types in the patient's comments, the doctor checks his or her computer between office patients and enters orders. The nurse directs the patient, often within the hour. Likewise, lab results are entered immediately and the patient is often informed of results the same day the test was administered.

From a business standpoint, the computer can handle the different diagnostic codes for each patient. With an integrated system, the computer instantly tells what's payable and what's not under each patient's medical plan.

"The insurance claim is clean, so we get our payment faster," Wertheimer said.

Wertheimer estimates just 5 percent of practices nationwide are paperless. NextGen uses his institute as a show site to entice potential new customers.

#### Martin Memorial Health Systems

Hospitals face a set of problems different from individual physician practices, and have been a bit slower to adopt electronic systems.

William R. Bollog, chief information officer and assistant administrator at Martin Memorial Health Systems, points out that he has 300 to 400 private practice physicians to integrate into a new electronic system.

He said that vendors that develop software for hospitals are not as far along as those who supply individual practices. He cites the much higher costs for hospitals, with such considerations as in-patients and many more facilities, and the fact that hospitals must fund other capital projects.

Martin Memorial started with an IBM mainframe in the 1970s, used exclusively for billing, accounts receivable, payroll and general accounting purposes. The hospital began using clinical software from leading supplier Meditech in 1986, introducing electronic patient registration and terminals on the patient floors

so that nurses and secretaries could enter orders. These became print-outs in blood and radiology labs, and results were then entered back into the system and printed out on the floors.

Bolilig joined Martin Memorial in 1994 following a long information technology career at an Ohio hospital. He now heads a staff of 33 in information services, compared to just nine when the hospital began the computer age.

In 1995, Bolilig introduced a perinatal system in obstetrics to track the entire birth process. The system captures fetal monitoring online, documents doctors and nurse actions, and includes data, pictures and text in one electronic record. He said tracking OB patient care is easier because fewer doctors are involved.

Since then, other areas have been added, including Martin Memorial's cancer center where the radiological oncologist inputs notes from a patient's other doctors, uses the computer to create a treatment plan, runs and monitors the treatment electronically and documents the treatment.

Martin Memorial's operating rooms use an electronic tracking system to locate each patient at each step of the process from pre-op to post-op. The system displays information at key points so all personnel are informed, up-to-the-minute. A similar system has just been installed in waiting rooms so that family and friends can also track the progress of their loved ones.

Electrocardiogram machines are now wireless. The doctor's orders go to portable EKG carts and results come back wirelessly to the cardiologist for reading. The old paper strip is now obsolete. And the process is much faster.

Martin Memorial is about to plunge into a virtually paperless world. A committee, including physicians, is now evaluating vendors with an eye toward visiting user sites, picking a system by this Fall and placing an order by January. Bolilig expects implementation in 12 to 18 months and elimination of all paper in three to four years.

"I'm hoping that when we design a new practice area, we won't even design in a chart room," he said.

Like the Heart & Family Health Institute, Bolilig expects a substantial return on investment through the elimination of most transcription services, paper and supplies, as well as real estate to house paper records.

Martin Memorial's laptops are portable and wireless. Nurses take them to the bedside and pharmacists can match up drugs with a bar code on each patient's wrist band to prevent errors.

Rather than using cell phones, which don't work everywhere, Martin Memorial uses 225 wireless phones with access points throughout its buildings, Bolilig said. He credits the phones with saving an amazing amount of staff time, especially for nurses.

Martin Memorial also stores images electronically, eliminating the need for most films. Surgeons still mount films in the operating rooms, but Bollig said he hopes to install large monitors to display the electronic pictures by next year.

Bollig said the next level of software, which includes order-entry for doctors, is expensive. While doctors will need to enter their own orders into the system, they will likely still have the option to dictate notes.

The system must have checks and balances built in to eliminate errors and build an audit trail for legal purposes.

"The electronic audit trail will be bigger than the actual record," Bollig said. "Every key stroke on every action will be recorded."

He also plans to use two-factor identification for physicians, including a unique badge that can be read in proximity to the computer and a doctor fingerprint.

As you might expect with more than 300 physicians in the health system, some embrace the electronic system and some don't. The Bollig says that attitudes are quickly changing.

"Two years ago, I had to force 99 percent of the doctors to even come to a meeting," he said. "Now, about half are pushing me to upgrade, another quarter are resigned to the changes and just a quarter are holding back."

Even doctors more accustomed to paper records are seeing that they can make more money and be more productive with an electronic system.

"I think we're ahead of more than half the hospitals in the United States in implementing these systems," Bollig said.

#### Indian River Medical Center

At Indian River Medical Center in Vero Beach, patient care outweighs cost savings, so executives there say it's difficult to quantify the dollars saved for every computer-related move.

"The primary driver for us is patient safety and quality," said chief operating officer W. Carl Martin.

Which is not say the center is stuck in the paper age. The center has digitized all radiological images at a savings of \$300,000 in \$350,000 in film annually, according to Martin.

Indian River introduced its hospital information system for business related functions in the early 1980s. The system runs on the popular AS 400 (now known as System i5) platform. It handles financial, accounting, orders, billing and admissions functions.

The hospital also has a long-running strategic relationship with McKesson, a healthcare services firm, for software. It ensures an integrated system for both business and clinical functions. In 1996, executives began installing more personal computers, and by 2000 introduced a clinical documentation system that allowed

nurses, physical therapists, respiratory technicians and dieticians to chart electronically.

Two years later, hospital leaders introduced an electronic medical record system with lab and radiology results sent electronically to the patient's electronic chart. Physician orders, notes and medication administration records are still on paper and scanned.

The hospital uses wireless computers on wheels, better known as COWs, for use by nurses. These screens are also wheeled into the operating rooms for all personnel to access patient records and images. Electronic charting in the ORs is scheduled to go live in December.

The pharmacy is now paperless and expects to implement a bar code system in 2008-2009 to match patients and prescriptions to prevent errors.

All 234 staff doctors can pull up the system through the Internet from home, office or while traveling. Martin cites the case of neurosurgeons, who can view a CT scan in the middle of the night from an incoming emergency room patient and order the proper response immediately, whether it be surgery or simply observation.

Cardiologists can look at electrocardiograms and obstetrics doctors can remotely pull up what are called "fetal strips" with the latest information on a yet-to-be born baby and its mother, especially in cases of distress for either.

"Doctors can access whenever and wherever they need to," said Randy C. King, manager of information systems for the medical center, who heads a 20-person department.

Coming in 2008, King expects electronic charting in the emergency room. He said there hasn't been a good software package yet to meet emergency room needs, but he has now bought a new system from McKesson.

The labor and delivery area is currently operating two charting systems simultaneously, but King said that will go to one system next year.

King said he hopes to be paperless in about three years. The last piece will be introduction of a computer physician order entry system that uses templates. King said the software is not quite good enough yet and still expensive.

Martin and King both expect many physicians to continue to prefer dictation of reports and notes. They say voice recognition systems are getting better, so that the day will come when transcribers will only edit the electronic report for errors. This should reduce labor costs.

King said the move to electronic records can eliminate at least half the printers at the facility for a dollar saving in the six figures.

Indian River has a wireless phone system for all mobile workers within the hospital. A new cell phone push is beginning this month as AT&T installs a repeater on the roof which will tie into an already-existing cable throughout the hospital to improve cell phone reception.

For patients who travel or maintain a second home, the hospital uses an Internet-based system known as My Medical History, which contains their records. Patients can give their password to medical providers in other locations for Web access. The hospital will also put the record on a compact disc if the patient requests it.

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