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Little Giant

How a tiny Missouri hospital became an EHR Goliath.

By Elizabeth Gardner

Denni McColm, CIO of
Citizens Memorial Healthcare,
in Bolivar, Mo.



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Rural health network zips past I.T. powerhouses to the EHR 'A' list.

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Citizens Memorial Healthcare in Bolivar, Mo., is like a Third World country that goes directly from no phone service at all to an advanced cell network almost overnight. In 2001, every shred of clinical information in the 74-bed hospital and its clinic network was on paper. By 2004, almost all the information in the hospital was electronic, and automation had established a beachhead in the clinic network, home care services, and the organization's several long-term care facilities.

By 2005, CMH had won a Davies Award from the Healthcare Information and Management Systems Society for effective use of information technology—the only one awarded that year, and the first one ever for a rural hospital. By 2008, it had become a HIMSS Analytics Stage 6 hospital, one of only nine at the time, with electronic provider order entry and documentation, clinical decision support and a digital system for images. And in January, CMH became one of 39 HIMSS Analytics Stage 7 hospitals—a select group that has entirely electronic medical records and is using them in advanced ways to improve communication and patient care.

The rest are either high-powered academic medical centers or members of large systems. Kaiser Permanente Health Foundation alone accounts for 24. How did tiny rural CMH end up here, leapfrogging over places like Boston's Brigham and Women's Hospital or the Mayo Clinic (both currently Stage 6), who've been chasing the same clinical automation goals since the 1980s?

The way CIO Denni McColm tells it, Citizens Memorial didn't realize at the time that it was doing anything unusual. "We thought we were catching up with other hospitals."

CMH CEO Donald Babb credits McColm. "When you give Denni a challenge, she'll do anything to make it happen the right way." And former HIMSS Analytics executive vice president Mike Davis credits Babb. "These organizations don't get to this point because of their CIOs," he says. "They get there because of their CEOs."

In fact, it took that strong executive leadership plus a certain *esprit de corps* on the part of the organization's board, management, employees and affiliated physicians. Small hospitals have one huge advantage over larger ones: their teams are smaller and easier to manage.

"The biggest step was to make everyone understand that this was what we were going to do and there were no other options," Babb says. "The doctors and the employees and the board all had to be a part of it. On the physician side, probably 75 percent bought in to start with. A few dragged their feet, but I kept saying, 'We're not giving up—let's just do it together and make it work.'"

Unique organization

Its I.T. sophistication isn't only thing that sets Citizens Memorial apart. Opened in 1982, it still has its original CEO and most of its founding board. McColm has been there since 1988, originally working in human resources and then as director of finance. She's health system's first CIO, since it didn't need one before.

The hospital is run under a district hospital authority that can levy taxes, but it stopped doing so in 1984, two years after opening, because it had become self-sustaining. Because of Missouri laws governing how hospital authorities may operate, CMH spun off a separate foundation in 1986 that runs its long-term care facilities and other allied health services. The foundation is also self-sustaining and its annual operating margins range from 3.8 percent to 4.5 percent.

The hospital currently has an operating margin of about 3.8 percent, Babb says, and a solid credit rating that allowed it to issue bonds to cover the \$6 million initial cost of the clinical computing effort. Babb estimates CMH has spent an additional \$3 million in the past few years, mostly financed through grants from the Agency for Health Research and Quality and other organizations.

Starting from scratch

When CMH started looking at computerizing its clinical information, in the late 1990s, it was at HIMSS Analytics Stage 0, with nary an ancillary system on site. The only automation in the hospital was a financial system running on an elderly IBM AS/400 minicomputer, and that system had been modified so many times that it was unrecognizable and becoming impossible to maintain.

Everything else was on paper. Because the care network covered nine counties and more than a dozen clinics (now up to more than 30), paper charts were being shipped continually between locations, and patients had little faith that they'd end up in the right place. Some of the chronically ill wanted to keep their charts with them, but Babb says that allowing them to do so led to care coordination issues and incomplete records. Clearly, something had to be done.

Babb put McColm in charge of figuring out exactly what, and they dubbed the effort "Project Infocare." She put together a steering committee with a dozen members representing all CMH interest groups. It took the better part of two years to figure out the organization's needs, generate a request for proposals, and select a vendor.

To hold down the cost and simplify installation and maintenance, the steering committee decided to look for a single vendor for as many applications as possible, including both clinicals and a financial system. A deal was sealed in December 2001 with Meditech, Westwood, Mass., which is the EHR vendor for about one of every four U.S. hospitals, according to HIMSS Analytics.

The case for a single vendor

McColm says Meditech won primarily because it had modules to handle the entire continuum of care that CMH was providing. "They were by far the strongest contender," she says. "Vital signs collected from home care automatically come into the EHR. Someone from our long-term care facility can go visit a physician in one of our clinics and have a stay in the hospital, and the details from all those places automatically go into the EHR."

She also praises the reliability of both system and vendor. "Service has been great and the product is solid."

CMH hasn't been hindered by Meditech's storied lack of flexibility. McColm says the system structures data in such a way that it so far has allowed other vendors to access it with relative ease.

Citizens Memorial uses data-mining services from the Institute for Health Metrics, Burlington, Mass., to produce reports for the Joint Commission and CMS, to benchmark itself against other hospitals, and to provide data for performance improvement. IHM works specifically with Meditech client hospitals and knows how to pull out the relevant information. "It's fabulous," she says. "IHM feeds information back to us every day. It can tell us, 'This patient has congestive heart failure, and you haven't provided x, y or z service yet.'"

The Meditech system also helped McColm win the doctors over with customized order sets. "We ran a bunch of reports



Louis Harris, M.D., is one of Citizens Memorial's physician champions.

before we got the doctors on the system, and there were about 25 things that they typically order," she says. "When they signed onto the system, the orders were waiting for them."

Speedy install

Once the contract was signed, installation proceeded at the breakneck pace described earlier. Family practice physician Louis Harris, M.D., was one of two main physician champions for the project, and represented affiliated physicians.

"We have a fairly young medical staff and they are a little more willing to jump on board and morph into whatever we need to get this done," he says.

CMH bit off big chunks as it switched from paper to electronic, says Harris. First, all lab reporting went electronic, then all documentation, then the ordering of labs, and then the ordering of everything else. "When we applied for the Davies Award, they asked us what percentage of orders were electronic, and of course we had 100 percent," he says. "I just assumed that everyone did that, because living in both worlds is dangerous and cumbersome."

McColm had physicians and nurses switch to the new system over the same time period. "We didn't realize it was crazy," she said. "And it turned out fine."

By trial and error, she discovered that one-on-one training worked best for physicians. She eliminated the paper chart after a six month period where they could choose whether to use paper or the new system. "We had to remind some doctors about their commitment several times during the implementation," she says, in a possible understatement.

In general, Project Infocare proceeded with as little fuss as possible. "One of the things that surprised me was the lack of fanfare when we went all the way paperless," Harris says.

HIMSS staging

As implementation progressed, McColm started filling out the questionnaires for HIMSS Analytics surveys. CMH was pegged fairly quickly as Stage 5, and in 2007 its answers prompted a call from Davis to see whether a Stage 6 designation was warranted. (It was.) During their conversations,

McColm inquired about Stage 7. “He said, ‘No one is Stage 7,’” she says. One of the components is information exchange, and McColm feels the literature regarding this was unclear. “We’re a small hospital, and we don’t need that much exchange, and I couldn’t ask our administration for \$100,000 to go play around with it.”

Nonetheless, she took up the challenge, and after adding a few capabilities in-house, she made an agreement for data exchange with Google Health, which allows patients to maintain personal health records and doesn’t charge providers for putting data into those records. She called Davis back and said she wanted to be assessed for Stage 7.

“We said, ‘A 76-bed hospital? Come on!’” Davis says. Despite his doubts, he sent her a long checklist of Stage 7 requirements, and when she said CMH was ready, he assembled a team and headed to Bolivar. “We went in there and were shocked, because they had done a very good job.”

Next up for CMH: go-live for its Google Health connection, plus ventures into telemedicine, including a technology for conducting simple sleep studies in the patient’s home.

“This shows that even small community hospitals can become very advanced, and that’s a great message to put to the market,” says Davis. ■

Citizens Memorial Vendors

Hospital, home care and long-term care facilities: Meditech (Client-server version 5.6)

Clinics: LSS Data Systems

PACS: McKesson

Document management:

Perceptive Software

Interfacing and reporting: Iatric Systems

Voice recognition: Nuance/Dragon Medical

CMH “Project Infocare” budget

Software: \$3,428,807

Hardware: \$1,588,543

Personnel: \$730,374

Travel & Training: \$255,000

TOTAL BUDGET: \$6,002,724

Sources: American Hospital Assn., CMH

US EMR Adoption Model

Stage	Cumulative Capabilities	2008 Final	2009 Final
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP	0.3%	0.7
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	0.5%	1.6%
Stage 5	Closed loop medication administration	2.5%	3.8%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	2.5%	7.4%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	35.7%	50.9%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	31.4%	16.9%
Stage 1	Ancillaries — Lab, Rad, Pharmacy — All Installed	11.5%	7.2%
Stage 0	All Three Ancillaries Not Installed	15.6%	11.5%

Source: HIMSS Analytics

Hospitals take the stage with HIMSS Analytics

How exactly does a hospital get to a Stage 7 designation? Some may be closer than they think.

Mike Davis, former executive vice president at HIMSS Analytics, says it's not so much about the technology that's in place, but what the institution is doing with it. He ran the Electronic Medical Record Adoption Model (EMRAM) program, and either he or former CEO Dave Garets visited every Stage 7 candidate personally. Both Davis and Garets left HIMSS Analytics at the end of March this year, joining The Advisory Board Company, a consulting firm that is partnering with HIMSS Analytics to develop research services.

"Stage 7 really gets to how you're using all this great automation to improve patient safety and outcomes," Davis says. "These organizations are really advanced and should be good mentors."

The first five stages are all scored from self-reported data. HIMSS Analytics does annual surveys of every U.S. hospital, asking for lots of gritty details on hardware, software, and deployment. The company makes the bulk of its income selling reports from that database to vendors and other interested parties, and therefore tries to get as many hospitals as possible to participate. More than 4,500 do. In exchange, they get free access to various tools and benchmark reports based on the data.

Each EMRAM Stage assumes that the institution already has in place all the systems in the lower stages. However, a hospital can sometimes move up a stage if it has the functionality only partially executed—say, in a single department.

The hallmarks of Stage 6, the first "award" level, are:

- Full physician documentation/charting, using structured templates, in at least one patient care area.
- Clinical decision support that provides guidance for all clinician activities related to protocols and outcomes in the form of variance and compliance alerts.
- A PACS (or multiple PACS) to provide medical images to physicians via an intranet, and no more film-based images.

Once a hospital gets close to Stage 6, it has to pass a phone interview with Davis, who grills the CIO and at least one clinician on things like what percentage of orders is entered directly by physicians, how much documentation is templated, and whether the system collects discrete data of the type needed for quality reporting and improvement projects.

As of January, 82 hospitals in the U.S. and one in Canada have received Stage 6 designations.

Once an institution is recognized as Stage 6, it receives a detailed checklist of criteria that differentiate Stage 6 from Stage 7. Moving up probably doesn't involve the purchase of any more hardware or software, but it may require major reengineering of workflow to get the most out of what's in place. For example, if anesthesiologists aren't charting electronically during a procedure, the checklist requires their information to be entered before they leave the operating room. That information includes

Citizens Memorial Healthcare at a glance

Location: Bolivar, Mo.
CEO: Donald Babb
CIO: Denni McColm
Opened: 1982
Staffed beds: 76
Ownership: Hospital district
Service area: 9 counties
Admissions: 3,439
Inpatient surgeries: 794
Outpatient visits: 242,597
Outpatient surgeries: 1,860
Emergency room visits: 19,582
Other: Through a separate foundation, owns 5 long-term care facilities and 24 clinics, and has 10 affiliated clinics
Operating margin: 3.8 percent (hospital), 3.8 to 4.5 percent (foundation)
Annual operating budget: \$245 million (hospital and foundation combined)

any drugs used during the procedure, so that they immediately become part of the patient's medication list. Even if they aren't continued past the end of the procedure, some may pose a risk of interactions.

"Anesthesiologists have argued that it's hard to put some drugs in there because they're delivered as drips, and you don't know exactly how much the patient got," Davis says. "I don't care how they choose to chart it, but it needs to be in there."

Once a hospital has gone over the checklist and made sure it can demonstrate all those capabilities, it's time for a site visit by Davis or Garets and at least two CIOs from hospitals at Stage 4 or higher. The CIOs serve on the survey teams as unpaid volunteers. "Most of them are interested in this because they're going through the same process now," Davis says.

Once on site, the team keeps an eagle eye out for paper charts, which are forbidden, except for a few stray items like monitor strips that might be prohibitively costly to scan into an EHR. They have hospital staff walk them through some of the capabilities from the checklist. They look particularly for evidence that the institution is able to use its data to analyze and improve quality of care, and that it's ready to share data with other providers in a health information exchange, even if there isn't one currently operating in its area.

No money changes hands—HIMSS Analytics covers all the costs for its staff and consulting CIOs to visit would-be Stage 7 sites. Davis says that at some point he may start asking hospitals to pick up travel costs for the evaluation team, but not in the near future.

Davis says the definition of Stage 7 will be a moving target, as his teams learn more about what defines the most effective EMR implementations.