



## Making IT Happen: Strategies for Implementing the EMR-EHR

In 1994, the Computer-based Patient Record Institute founded the Davies Awards of Excellence and managed the program until merging with the Healthcare Information and Management Systems Society (HIMSS) in 2002. The award has annually highlighted healthcare providers who successfully led efforts to transform their organizations through technology, with the award largely focusing on the implementation of healthcare information technology (IT) in larger institutions, ranging from rural health systems to big city hospitals. [

The awards are named in honor of Dr. Nicholas E. Davies, an Atlanta-based practice physician committed to the ideal of improving patient care through better health information management. As a member of the Institute of Medicine's Patient Record Study Committee, Dr. Davies helped coin the term "computer-based patient record," now more widely known as electronic medical records and electronic health records (EMR-EHR). A tireless advocate for IT solutions, Dr. Davies was chairperson-elect of the American College of Physicians when he was tragically killed in a plane crash with Senator John G. Tower of Texas in April, 1991. His spirit lives on in the Davies Award of Excellence.

In 2003, HIMSS extended the awards to include ambulatory practices with EMR-EHRs and in 2004 added yet another category for public health. Sponsored by HIMSS, the Nicholas E. Davies Award Program encourages and recognizes excellence in the implementation of EMR-EHR systems through showcasing concrete examples, understanding and sharing the value of EMR-EHR systems, offering visibility and recognition for their projects and sharing successful implementation strategies.

The papers are evaluated in terms of EMR-EHR implementation, strategy, planning, project management, and governance. The clinicians who submit entries discuss the functionality of their EMR-EHRs and how those systems met the needs of staff and patients. Additionally, they speak to how the technology design works to bring about the desired functionality and the institutions' return on investment.

The purpose of this white paper, and the three others in this collection, is to give healthcare providers a survey of best practices in EMR-EHR implementation, solid examples of leadership, and a glimpse at the return on their investment (ROI) the EMR-EHR offers. This paper, focused on implementation, surveys the varying approaches that different organizations take in implementing EHR technology, whether they choose the "slow-roll" or the "big bang" approach to instituting healthcare IT.

Most of the information in these papers comes from Davies "organizational" winners between the

years 2001 and 2005—the post-Y2K era—when EMR-EHR vendors began aggressively adding more modernized features to their clinical systems, and EMR-EHR implementation became more sophisticated. Large hospital systems surveyed include **Maimonides Medical Center** in Brooklyn, NY; **Queens Health Network** in Queens, NY; **Evanston Northwestern Healthcare** in suburban Chicago, IL; **Cincinnati Children’s Hospital Medical Center**, OH; **The University of Illinois at Chicago**; **Ohio State University Health System**, Columbus; and **Harvard Vanguard** in Boston, MA. Smaller institutions include **Heritage Behavioral Health Center Inc.** in Decatur, IL, and **Citizens Memorial Healthcare** in Bolivar, MO.

## Planning for the Transition

This paper describes the implementation styles of various Davies award-winning organizations, approaches that vary widely. Some organizations choose and implement systems quickly—the "big bang"—often using one or a few vendors to create interoperating systems that maximize the clinical benefits of healthcare information technology (IT) as rapidly as possible.

Others plan a gradual implementation in order to ease the pains of transition from paper to electronic and to give the organization a chance to learn from the mistakes and successes of each clinical department as the system is rolled out.

Some organizations lay down the gauntlet and demand that physicians adapt to an electronic environment—or, in at least one case, risk their right to refer patients to the hospital. Others use the carrot-and-stick approach, urging doctors to adapt by stressing the benefits, sometimes even relying on peer pressure to get reluctant clinicians to make the change.

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One theme that is consistent throughout the Davies application papers is the need—once the decision is made to implement a clinical IT system—to devise an overarching strategic plan for the EMR-EHR. These plans generally result from meetings among planning teams, during which a series of sweeping objectives are presented, that often include members of hospital administration, management staff, board members, and medical staff.

The strategic objectives guiding the EMR-EHR implementation during Project Infocare at **Citizens Memorial Healthcare**, a 74-bed acute care facility, are fairly typical. They included

- Enhance access to care
- Improve continuity of care
- Provide physician connectivity
- Gain operational efficiency
- Support facility and services expansion
- Push quality and performance improvement

It is also typical that 2005 Davies award winner **Citizens Memorial** targeted the elimination of paper in favor of "queryable data," sought to integrate a longitudinal health record across the continuum of care, and worked to develop electronic decision support features, along with improved workflow and communications. It targeted these improvements after an information systems (IS) steering committee recruited team members, led discussions, scheduled demonstrations, and analyzed various requests for proposals. Again, all that is relatively typical.

Partly because of its small size, **Citizens Memorial** was able to get most of its needs fulfilled by a single vendor. And it was also able to pull off a "big bang" fast implementation.

The same was not true for 2002 Davies award winner **Maimonides Medical Center**, a 705-bed healthcare center employing 4,600 workers, including 277 staff physicians who coordinate care with nearly 1,000 community physicians. Maimonides, the site of the first human heart transplant, actually depended on a 1960s-vintage keypunch processor up to the mid-1990s. In contrast, by 2002 it had the only known healthcare information system in the United States to incorporate discrete EMR-EHR components from four vendors, in addition to an abundance of electronic "feeder systems." Maimonides is an example of the gradual, "slow-roll" approach, having implemented its first system in 1996 and wrapping up with an emergency department EMR-EHR rollout in March 2002.

Nonetheless, despite the far greater complexities faced by facilities like Maimonides, and other large Davies-award winning organizations like **Evanston Northwestern Healthcare** and the **Queens Health Network**, the planning regimens each followed have many similarities with those undertaken by smaller, more nimble organizations such as **Citizens Memorial**, or even by some large ambulatory practices.

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Most importantly, in each case, leadership from the CEO on down demonstrated tremendous commitment to going electronic across the continuum of care. Leadership teams were assembled, and while mistakes and misjudgments were occasionally made, a premium was always placed on orderly and effective communication of the organization's goals.

At **Evanston Northwestern**, to use one example, the CEO, COO, CFO, CIO, senior vice president of informatics, and several other key officials served on the EMR-EHR project steering committee. Evanston's COO also chaired semi-monthly meetings during the run-up to development and implementation and was responsible

for the project's outcomes. (Leadership issues are further explored in the third paper in this series, "A Desire for Change.")

As part of a holistic planning process, many Davies winners conducted risk assessments and outlined approaches to mitigate the challenges they determined they were facing. As the submission filed by the **Cincinnati Children's Hospital Medical Center** attests, the greatest risk management issue many EMR-EHR projects faced was the prospect that clinicians might not buy into organizations' commitment to clinical IT.

As it developed, those clinical areas of **Cincinnati Children's** in which physician buy-in was strongest were where EMR-EHR implementation ultimately proved most beneficial. Much of that came down to the pre-implementation planning, which in one sense began as early as 1995 with the appointment of a CIO and the establishment of a budget for new capital infrastructure. By the time of the EMR-EHR go-live in the first quarter of 2002, the process of preparing the institution had been largely employee-driven.

"Live planning sessions with a unit that involved key managers and staff leaders from the patient care area were a good predictor of support that would be needed to ensure success at the time of the implementation and to sustain the project in that area," the Cincinnati application states. "Those units that took responsibility for problem solving associated with the implementation have

been those that have found the greatest satisfaction and seen the most benefits."

The application for one of three 2001 Davies award winners, The **Ohio State University Health System**, hits a similar chord. "The importance of operational planning for the impact of new technology cannot be overemphasized," the paper states. "To maximize operational success, a culture of change must be espoused by medical and administrative leadership."

### **System Acquisition**

Once the overarching strategy for clinical IT is in place, it is time to begin the process of acquiring technologies that meet the institution's needs. Again, there are many paths to choose from, but Davies winners mainly have chosen among these options: using a best-of-breed approach; choosing an integrated system; building a self-produced custom system, or buying off-the-shelf. They also had to decide whether to bring in consultants.

Perhaps the most important early decision organizations must make is whether to employ an integrated systems strategy or a "best-of-breed" approach. Integrated systems involve multiple clinical applications with a common database and uniform user interface, giving various modules a similar look and feel. That's the upside. The problem is that some important clinical features of an all-in-one styled system may be fairly under-developed.

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Best-of-breed systems, meanwhile, generally involve at least a primary if not a solo vendor and are designed to excel in one or several applications. However, some important features may not be available at all, and the systems may require intensive training and support, impose complex system interfaces on users, or pose other problems.

Because few single-vendor systems are sufficient for complex healthcare environments, in recent years most institutional Davies award winners have opted for the integrated systems strategy, though many ambulatory health facilities still tend to go the best-of-breed route.

A notable exception to that trend is **Maimonides Medical Center**, which opted to use selected vendors that met physician and departmental needs, while conforming to its interfacing, hardware, software, and operating standards. "Maimonides works closely with its vendors to develop tailored systems that provide the precise functionality that individual departments require," the organization's application form reads.

From the outset, Maimonides targeted an integrated EMR-EHR but soon realized that no single vendor could build and deploy all the systems needed to integrate Maimonides' clinical departments. However, one particular vendor *could* provide an integration interface between the disparate systems. Thus, Maimonides indicates, it settled on a "modified best-of-breed approach," albeit one that turned out to be the most expensive implementation among all the Davies winners.

Some of the other choices various organizations face during the acquisition process include whether to look to commercial vendors or self-produce a clinical IT system, and whether to "rip and replace" existing systems or build onto and enhance existing technologies.

The Gemini Project, a 2001 Davies award winner at the **University of Illinois at Chicago**

**Medical Center**, was 6 years in the planning, and at the time of its Davies application, the EMR-EHR contained medical data on more than 2 million patients. Although the medical center has a competent technology staff, it is medicine—not information technology—that represents its core competency.

Thus, it was decided early on that Gemini would *not* be a self-produced system of custom applications, and university leadership began looking to outside vendors that could facilitate enterprise-wide connectivity and clinical decision support. Ultimately, the university decided on a **single vendor** because its product provided a flexible architecture and had the capacity to generate a longitudinal record containing both inpatient and outpatient information.

"This approach was less expensive, enabled UICMC to learn from other organizations already using the vendor's application, and provided an enterprise-wide system that could be recreated at other healthcare organizations," the University of Illinois at Chicago application states.

**Cincinnati Children's** was faced with a slightly different decision. Given its need for computerized order entry and clinical documentation, the institution decided that an off-the-shelf system was not appropriate. In addition, by the year 2000, it had already made a significant investment in one healthcare IT system. The clinical information systems staff understood that system well and felt comfortable that it could be enhanced by adding software tools to support such pediatric care elements as weight-based dose checking.

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Eventually, various functions including clinical documentation, order entry, a lifetime clinical record, and a rules engine were added to Cincinnati's legacy system, in an implementation roll-out that began with planning in the second quarter of 2000 and wrapped up with the clinical documentation go-live in the fourth quarter of 2003.

Boston's **Harvard Vanguard Medical Associates**, a clinician-led multi-specialty group practice that serves 300,000 of the Harvard Pilgrim Health Care HMO's insured members, faced a different kind of quandary.

A 2000 Davies Award winner, Harvard Vanguard clinicians had been using automated medical records for more than 20 years; it was, in fact, the first installation site for the COSTAR system developed by Massachusetts General Hospital in the 1960s. By the 1970s, its clinical IT system had morphed into Harvard Vanguard's own proprietary offshoot of COSTAR, renamed the Automated Medical Record System.

That history made Harvard Vanguard less than a compelling customer for nascent healthcare IT vendors, who saw the provider as a potential competitor. It also left the organization with little knowledge of what kinds of technologies were available on the open market. When the time came for the institution to explore commercial EMR-EHR options in the early 1990s, Harvard Vanguard turned to consultants to help identify potential products and "to make it clear to the vendors that a true selection process was going on and not industrial espionage."

### ***By Request***

After an institution decides what type of system it will acquire, it moves onto the actual process of obtaining it. This, obviously, is a key step in the process and one of the points along the path at

which clinician buy-in can be doomed, along with the EMR-EHR project itself, if stakeholders are not closely involved. No organization among the Davies winners had a more sophisticated—or a more inclusive—acquisition process than the **Ohio State University Health System**.

As did other Davies applicants, **Ohio State** first conducted a thorough needs assessment—beginning in 1993. It then organized several committees—including the Clinical Communications Committee and the Computerized Patient Records Oversight Committee—to jointly oversee its formal EMR-EHR request for proposals process.

Three vendors were chosen as semi-finalists. Ohio State then involved hundreds of staffers in vendor review sessions, during which employees completed vendor survey forms while the vendors themselves responded through their IT systems to real-life patient scenarios.

Out of that process, two companies were asked to participate in contract negotiations and more in-depth reviews. Finally, a formal "vendor-of-choice vote" was held, resulting in the selection an IT vendor. A parallel process held around the same time resulted in the selection of a different vendor for medical imaging. A third system was subsequently deployed for patient registration and billing, and over time such functionality as respiratory therapy and chemotherapy summaries were added to the EMR-EHR, along with diagnostic imaging.

At **Harvard Vanguard**, nearly 90 vendors responded to the organization's formal request for information, a list eventually winnowed down to 5—all of whom were eventually invited to make a two-day presentation based on medical scenarios devised by a selection team and provided to each vendor two weeks in advance.

One day of the presentation focused on technology reviews, while the other was split into administrative reviews and clinical functionality. Harvard Vanguard asked each vendor to follow the scenario it was given exactly. If the vendor couldn't demonstrate requested functionalities in the order requested, the selection team presumed that the vendor couldn't meet that particular clinical need.

**"Clearly, the inclusion of physicians throughout the development and implementation process assisted in the transition."**

*Ohio State University  
Health System*

When the process was done, only one vendor met or exceeded all of the Harvard's threshold criteria, and was brought onboard for Harvard's clinical IS project. The EMR-EHR went live in September, 1996.

The most recent Davies applicants that are the focus of the papers in this series have enjoyed a luxury the earliest Davies award recipients clearly did not have—clinical information technologies that had already been road tested by their caregiver peers. This is only one reason why the most recent Davies winners owe a huge debt to EMR-EHR trailblazers such as **Intermountain Health Care** of Salt Lake City (Davies winner, 1995); Boston's **Brigham and Women's Hospital** (1996); Indianapolis-based **Regenstrief Institute for Health Care** (1997); and a host of other healthcare IT pioneers. In its paper, Regenstrief indicates it had "to develop programs that would organize, display, and 'think about' the medical record content in useful ways."

But that kind of internal software development effort was no longer necessary by the time **Citizens Memorial** kicked off its EMR-EHR project in March, 2002. The healthcare IT market had matured enough by then that the institution could select a product vendor based on its "proven technology." After viewing demos by three top vendors, and after receiving evaluation

surveys from 100 project team members, Citizens was in a position to select an EMR-EHR, based largely on the fact that the company's technologies were already in place and in use at 1,900 healthcare organizations.

### *Who's in Charge?*

A brief word on project governance seems in order. Careful, thoughtful oversight and engaged leadership are hallmarks of every Davies-winning implementation. Different organizations approached governance in various ways, of course. Depending on the institution, EMR-EHR governance might fall under the aegis of one committee, or a combination of many project teams. Hospitals frequently had separate governing bodies overseeing implementation.

A good case in point is the Gemini Project at the **University of Illinois at Chicago Medical Center**, which relied on several committees to see that project through. According to its application submission:

"At the tactical level, several committees oversaw the Gemini Project planning and implementation. Each was co-chaired by physicians and an IT representative and included members from relevant ancillary departments. Each group had a specific functional goal. The Implementation Committee, for example, oversaw all aspects of implementation—from hardware placement to training clinicians. Each group provided input relevant to their area of expertise."

Those committees were not disbanded after implementation, either. Instead, they were merged and renamed the Implementation and Operations Committee, which, at the time of Chicago's application, included representatives from the laboratory, pharmacy, nursing, physicians, nurse practitioners, and other constituencies. Leveraging the experience gained during implementation, the combined committee continued to meet biweekly to address such issues as system performance, security, and nomenclature standards. A big part, perhaps even the paramount aspect of project governance, is to take responsibility for clinician buy-in and system adoption. That requires effective communication.

**Harvard Vanguard** is among the applicants that maintain this clear communication with clinicians. Utilizing the input of end users during the planning, acquisition, and implementation processes is not just a nice thing to do; it is a practical necessity. "Open, honest, and regular communication with clinicians is a risk management tool that has been successful for Harvard Vanguard," states its paper.

**Ohio State** sounds a similar note. "Clearly, the inclusion of physicians throughout the development and implementation process assisted in the transition," Ohio State states in its application form. "But the learning curve was still extremely steep."

And that leads us very nicely to our next topic.

### **Training and Support**

Arguably, the critical step in the implementation process happens after the technology is in place: teaching end users to successfully navigate and utilize the technology and consistently supporting them as they gain EMR-EHR proficiency. In its award application, **Cincinnati Children's** refers to training as "communication, education, and support," and that is a pretty good summary of what is involved.

Davies applicants tried numerous training methods, several of which will be discussed in this section. Perhaps the most outstanding training regimen described in any of the Davies applications was the one undertaken by **Maimonides Medical Center** during the implementation of its Maimonides Access Clinical System (MACS). It merits special attention.

**"When all else failed, the final tactic usually made the difference—the sight of a stack of pizzas being delivered to the training room."**

*Maimonides Medical Center*

**Maimonides'** IS staff relied on "just-in-time" training administered according to specialty or department, using a physician-approved curriculum. Essentially, this staff focused on the "human aspect" in training end users to master the hospital's newly implemented, multi-vendor EMR-EHR. As Maimonides' application states, MIS decided that the best way to train clinical staff to use the system was to find the most comfortable way for them to use it, and medical staffers credit this training style as the most important factor in the success of the project.

As of March, 2002, MACS trainers provided 61,000 hours of instruction to 13,722 people. Some of what lay behind all that training was pure tactics. For instance, one ploy used to make computer training more palatable to Luddite-leaning clinicians was to avoid referring to it as "training" but instead to pitch announcements for class sessions as offering to help Maimonides' physicians learn to navigate both the Internet and the new Maimonides intranet. This simple step virtually erased the shame that is attached to "computer illiteracy."

"After completing the two-hour class, any hesitation that caregivers might have had to sign up for the MACS classes was removed, because they no longer felt the stigma of admitting a lack of basic PC knowledge," the hospital's application states. "When all else failed, the final tactic usually made the difference—the sight of a stack of pizzas being delivered to the training room."

Management information systems staff focused on what it called clinicians' "rights"—the right location, the right instructors, scheduling classes at the right times, tailoring classes in the right way to give training to individual segments of the caregiver population, producing the right manuals, and so on.

Nurses, doctors, and ancillary staff received training separately, because each uses different clinical pathways, and each is accustomed to viewing patient information in different ways. Physicians received three hours of training on the MACS system and another hour of training on Picture Archiving and Communications System (PACS) Registered nurses received 12 hours of training in order entry results reporting and medical administration documentation, and were instructed how to order emergency verbal orders for physicians. Ancillary staff—including everyone from patient care technicians to information specialists—received seven hours of separate MACS training.

Among the most striking moves Maimonides made to ensure its training regimen would result in EMR-EHR buy-in was its decision to recruit nurses to the MIS staff, on the theory that physicians were most likely to trust the people they knew best and most respected day in and day out: nurses. Those nurses who had been staff development instructors were hired to become MIS employees and MACS instructors.

Another surprising tack that helped Maimonides convince physicians to adopt the EMR-EHR was its decision to work training around physicians' schedules, rather than trying to force doctors to

work their schedules around training. MIS trainers were known to sometimes schedule classes in the middle of the night in order to accommodate doctors' schedules.

Here, in somewhat lesser detail, are a few other examples of interesting and effective approaches to EMR-EHR training and support:

- At **Citizens Memorial**, the selected vendors' employees trained project team members to use each clinical application before anyone else received training. This was completed in two sessions—one on-site at the hospital, the other in Massachusetts at the vendors' corporate headquarters. Although a significant expense, the trip was deemed worthwhile by hospital administration. Based on those sessions, project team members developed a training curriculum and later conducted the training. Classes were done in four-hour increments in a mobile classroom at the hospital and at five of the organization's offsite long-term care facilities. Interestingly, the initial plan to conduct physician-to-physician training failed, and was replaced by one-on-one training, conducted by members of the computerized practitioner order entry (CPOE) team. Citizens reports that one of its key decisions was to recruit project team members with both clinical experience and communication skills.

- **Cincinnati Children's** developed a training plan around a three-pronged strategy. First, it launched an in-house public relations campaign approximately 18 months prior to implementation to "infiltrate and saturate the organization" with information about the EMR-EHR's benefits. Second, it devised a system of role-based training sessions structured according to user-specific content. Finally, it incorporated just-in-time training, coordinated with staged implementation plans for specified patient care areas. Ongoing support comes from a group of newly hired IS support staff known as the "Blue Coats," whose aim is to provide 15-minute response times to any end user who leaves an IT assistance request on a voice mail message. "The Blue Coats were instrumental in gaining compliance with the surgeons," the institution's application states.

- **Evanston Northwestern Healthcare** made what it calls "a massive investment" in training—the largest to date for Evanston itself and one of the largest such investments for any U.S. healthcare institution. At Evanston, a large organization that opted for a rapid EMR-EHR deployment with a single patient-centric database covering all its affiliated hospitals and offices, the role of trainers was not just to teach software, but also to introduce new workflows and radical new ways of performing jobs. Evanston's approach could almost be described as Draconian—anyone whose job would require them to "touch" the system was required to verify a level of competency that surpassed the vendor's own end-user standards. This included physicians, who were required to undergo 16 to 24 hours of training and pass a competency examination or face being refused permission to admit or treat patients in any Evanston Northwestern hospital. Training began in September, 2002, five months before the EMR-EHR's go-live date. A scaled-down version of the training programs remained in place as of 2004, to teach new hires, students, and house staff to use the system and to prepare them for software upgrades and enhancements. (Evanston's training regimen was not without its hitches, however. Its vendor initially recommended that two training people be brought in during implementation, but leadership quickly realized that was not nearly enough. At the project's peak, 30 consultants worked as temporary IS staff to assist with training, and new IS workers were hired during the next budget cycle.)

- At **Queens Health Network**, a 2001 Davies award winner comprising two hospitals with

a combined 771 inpatient beds and 11 freestanding clinics in New York's borough of Queens, training was coordinated with clinical and ancillary departments and scheduled at the convenience of caregivers. After implementation, a project team provided ongoing instruction whenever new functions were introduced or at the end-user's or a supervisor's request. In 2001, a computer-based training program was installed in a "hugely successful" effort to provide better education access for all levels of staff using the system's chart review features.

- At **Veterans Affairs Puget Sound Health Care System** in Washington state (a 2000 Davies winner), implementation of a VISTA-based EMR-EHR system was conducted in six "waves" between September, 1997 and October, 1999; each was coordinated around geographic regions. The approach to user training changed during implementation to meet the needs of each wave. Beyond that, VA Puget Sound was faced with a problem that was once commonplace and now seems to be dwindling—staffers who were incapable even of typing on a computer keyboard. Initially, training was conducted in four- to eight-hour blocks, with groups of 20 people receiving training from several instructors in classroom settings. Over time, training was changed to involve smaller groups, with many sessions occurring in the clinic, ward, or other care settings. A Web tutorial describing the EMR-EHR was also provided on all workstations.

### Lessons Learned

There were a great many lessons learned by Davies award recipients during their EHR implementations, some of which might have value to other caregivers planning to embark on or extend their own journeys into the world of healthcare IT. A few valuable examples follow:

- From **Queens Health Network**: "The most important rule to be followed as the EMR-EHR is planned and implemented is the simplest: Listen! Listen to physicians to learn what they need to take care of patients. Listen to explanations of patient flow and paper flow to understand how to develop tools to expedite these processes. Listen to users and creators of clinical information to understand what is essential and what wastes time."

**"The most important rule to be followed as the [EMR-EHR] is planned and implemented is the simplest: Listen!"**

*Queens Health Network*

- From **Ohio State University**: "Even during pilot and beta phases of a project implementation, system stability is essential to gaining user confidence in a system. Even brief periods of instability can leave a negative impression long after the instability has been resolved." For example, during Ohio State's order entry pilot, there were significant stability issues with wireless laptops, issues that wore on workflow and user satisfaction. This resulted in tightened stability requirements for applications implemented or piloted in a clinical environment.

- From the **University of Illinois at Chicago Medical Center**: "During the first week of inpatient orders implementation, [Project] Gemini was virtually unusable during peak periods. The downtime database provided a critically important safety net and maintained clinician confidence in the Information Technology Department and Gemini during the difficult transition period."

- From **Cincinnati Children's Hospital Medical Center**: "It was identified early in the

implementation planning stages that the critical care unit documentation requirements could not be met by the data entry fields and displays available within the system. The time it took to perform the frequent documentation of various clinical data, such as vital signs, was also unacceptable. Therefore, the extent of the implementation of Clinical Documentation within the critical care areas was limited to Med/IV Charting and admission history. As a result of these findings Cincinnati Children's began pursuing a critical care documentation system."

- From **Maimonides Medical Center**: "A lesson learned early in the process was to strategically deploy [EMR-EHR] functionality based on what could be tolerated both by patient and user. User skill level should be tied to patient needs; for example, a novice computer user should not be assigned to a busy triage area entering a full patient history online."

- From **Harvard Vanguard**: "Timing of implementation of desktop software management tools could have saved hundreds, if not thousands of man hours if a tool had been implemented sooner. These hours translate into considerable expense, rarely available in healthcare settings. It is recommended to have such a tool available prior to implementing a comparable [EMR-EHR]."

## **Appendix**

### ***Davies Award Winners***

The following is a list, by year, of recent Davies' award winners. The statistics cited are taken from the submissions and have not been updated.

#### **2005**

Name: Citizens Memorial Healthcare

Location: Bolivar, MO

Practice Size: one hospital, five long-term care facilities, 16 physician clinics, three hospitals with 800 beds, 68 office locations

Number of Physicians: 98

Nurses: NA

Total Staff: 1,538

Patient Volume: 130,031 clinic visits, 19,888 emergency visits; 2,776 surgeries, 464 births, 14,455 home case visits

Vendor: MEDITECH

#### **2004**

Name: Evanston Northwestern Healthcare

Location: Evanston, IL

Practice Size: three hospitals with 800 beds, 68 office locations

Number of Physicians: 1,600 hospital physicians, 284 community-based physicians

Nurses: 1,300

Total Staff: NA

Patient Volume: NA

Vendor: Epic

## **2003**

Name: Cincinnati Children's Hospital Medical Center  
Location: Cincinnati, OH  
Practice Size: 324-bed children's hospital  
Number of Physicians: 1,045  
Nurses: 1,750  
Total Staff: NA  
Patient Volume: 696,310 outpatient visits; 87,000 emergency visits, 20,303 inpatient visits, 11,717 home care visits  
Vendor: INVISION, Siemens Medical Solutions Health Services Corporation

## **2002**

Name: Maimonides Medical Center  
Location: Brooklyn, NY  
Practice Size: 705-bed hospital  
Number of Physicians: 277 staff, 978 community physician network  
Nurses: NA  
Total Staff: 4,612 total staff  
Patient Volume: 367,000 (est.)  
Vendor: Eclipsys 7000 Inpatient, NextGen Ambulatory Care CPR, E&C IP Rob Perinatal CPR, A4 Health Systems Emergency Department CPR

Name: Queens Health Network  
Location: Queens, NY  
Practice Size: two hospitals, 11 medical clinics, six school-based centers  
Number of Physicians: 748  
Nurses: NA  
Total Staff: 6,106  
Patient Volume: 1 million ambulatory visits  
Vendor: Ulticare Patient1, Per Se Technologies

## **2001**

Name: University of Illinois at Chicago Medical Center  
Location: Chicago, IL  
Practice Size: 450-bed hospital, two outpatient centers, 12 primary care centers  
Number of Physicians: 715 physicians  
Nurses: 1,200  
Total Staff: 1,460  
Patient Volume: 18,000 inpatient visits, 400,000 outpatient visits  
Vendor: HNA Millennium, Cerner Corporation

Name: Heritage Behavioral Health Center, Inc.  
Location: Decatur, IL  
Practice Size: One facility, several outreach programs  
Number of Physicians: Not available  
Nurses: NA  
Total Staff: NA

Patient Volume: 4,000  
Vendor: HNA Millennium, Cerner Corp.

Name: Ohio State University Health System  
Location: Columbus, OH  
Practice Size: five hospitals, 849 staffed beds  
Number of Physicians: 700  
Nurses: NA  
Total Staff: 5,998 members, includes nurses  
Patient Volume: 41,565 hospital admissions, 232,628 inpatient days, 80,852 emergency visits,  
697,843 physician office visits  
Vendor(s): Siemens, IDX, AGFA-Bayer, SeeBeyond, Oracle

## **2000**

Name: Harvard Vanguard Medical Associates, Harvard Pilgrim Health Care  
Location: Boston, MA  
Practice Size: 14 delivery settings  
Number of Physicians: 600  
Nurses: NA  
Total staff, 2,100  
Patient Volume: 300,000  
Vendor: EpicCare, Epic Systems, Inc.

Name: Veterans Affairs Puget Sound Health Care System  
Location: Washington State  
Practice Size: two large campuses  
Number of Physicians: 850  
Nurses: 668  
Patient Volume: 40,000  
Vendor: Self-produced

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