



## **The ROI of EMR-EHR: Productivity Soars, Hospitals Save Time and, Yes, Money**

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 ROI, goes into depth on how process improvements increase care; ensure greater patient safety; and produce better patient care, higher productivity and cost savings.

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.

### **Soft Return on Investment**

This paper defines “soft return on investment” as clinical variables promulgated by EMR-EHRs in such areas as patient safety, process improvement, and regulatory compliance. In their written applications, Davies Award winners offer detailed analysis in these categories, though they do not always include hard statistical data that prove their business cases.

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It may be that many such factors are simply immeasurable. Unlike the many industrial companies that practice Six Sigma principles—a process improvement protocol requiring reams of data—healthcare providers face many challenges in quantifying every aspect of their practices. Although every treatment made by a physician or a nurse is chargeable, as lengthy medical bills attest, they are not always definable in terms of hard ROI.

Still, soft ROI carries just as much—and possibly more—importance to healthcare institutions, because many soft-return factors are transformative. Reducing errors in medication through decision support systems saves lives. Having access to a patient’s entire healthcare history helps improve care. Aggregated data analysis assists in focusing providers on performance enhancements. EMR-EHR software offers a wealth of clinical data, and in that data can be found the seeds of improvement, of change, of challenge, and of success.

### ***Patient Safety***

The healthcare industry sees improving patient safety as a major imperative, especially as an Institute of Medicine study in 1999 revealed that as many as 98,000 Americans may be dying every year as a result of missed diagnoses, fatal drug interaction, and inappropriate treatment by physicians and nurses.

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has made improving patient safety one of seven initiatives for the coming year. Davies winners invariably cite patient safety as one of the prerogatives of implementing an electronic health record (EHR) in their hospitals.

**Evanston Northwestern Healthcare** (Davies winner, 2004), writes that “the vision of a paperless system” promised to “improve patient safety by eliminating problems associated with illegible orders and medication orders.” Under its “mission and vision” section, **The Ohio State University Health System** cited its desire to “maximize the quality of patient care” as its number one goal for having an EMR-EHR. **Cincinnati Children’s Hospital Medical Center** saw

“optimizing patient safety” as the first of nine strategic objectives. **Citizens Memorial Healthcare**, a rural provider, saw patient safety as “eliminating handwriting/transcription errors by requiring completeness of orders, through clinical decision support, and by providing access to clinical information and a patient medical history.”

In fact, simple things such as replacing the bad handwriting of harried physicians move healthcare providers toward more accurate treatment of patients while reducing the time staff and pharmacists devote to dealing with drug interactions or prescribing issues. EMR-EHR software embedded with decision support alerts physicians, nurses, and other staff to the potential for prescription problems while helping them automatically calculate dosages based on patient characteristics.

The Davies award winners cite a number of patient safety improvements in several areas in addition to improving prescription practices. Here is a glimpse at some of the data submitted in their award proposals:

**Maimonides Medical Center** (Davies winner, 2002), a 705-bed hospital, saw problem medication orders drop by 58 percent and medication discrepancies by 55 percent in 2001 after its EMR-EHR implementation. That same year, the decision support feature identified 164,250 alerts, resulting in 82,125 prescription changes.

The provider’s EMR-EHR addressed “high alert medications,” confusing look-alike and sound-alike drug names, as well as patients with similar names that could potentially cause the pharmacy confusion.

**Queens Health Network** (Davies winner, 2002) experienced a 50 percent decrease in pharmacist interventions in medication orders in ambulatory care because of improved legibility, system alerts, and increased completeness of prescriptions. Due to point-of-care availability of real-time patient information, the hospital network has seen reduced numbers of admissions resulting from warfarin toxicity, a common problem when drug dosages are wrong.

Online medication charting saw errors in transcription drop to zero for departments in which EMR-EHRs were in full use at **Ohio State University Health System** (Davies 2001). In areas where the EMR-EHR had not been implemented, transcription errors ran as high as 26 percent in its system. Other healthcare providers also saw transcription errors drop to zero.

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**Evanston Healthcare** found that new procedures regarding a medication could be introduced in just hours. Problems with Dilaudid, for example, brought about different recommended doses in patients. The hospital changed 32 order sets and 22 preference lists in 3 hours. In one week, a physician-led pathway team designed a risk-assessment tool for blood clots in legs, now used throughout the hospital.

The healthcare provider also found that omitted administration of medications decreased 22 percent, from a total of 18 to 14 a month.

**Cincinnati Children’s**, a 324-bed hospital, found medication errors dropped by 50 percent and mislabeled laboratory specimens, another area of concern, decreased to nearly zero. Care orders

for common diagnoses such as asthmaticus, bronchiolitis, and gastroenteritis often had followed no set guidelines previously, but these, too were improved. Using evidence-based guidelines found in the EMR-EHR, the hospital showed a 20 percent improvement in the consistency of care for bronchiolitis, for example.

The hospital foresees improvement being replicated with other diagnoses.

### ***Process Improvement***

Summarizing all the process improvements that come with an EMR-EHR implementation is difficult. Many healthcare providers spend several pages in their applications simply describing how their EMR-EHRs encouraged them to change communication and workflow to reflect their newfound ability to access patient records from multiple locations.

A common user interface is one process improvement that allows hospital personnel to navigate user-friendly screens to locate patient data, in stark contrast to the hodgepodge of software systems and interfaces many hospitals employed in the past. By using consistent electronic data sets for every patient—again, a novelty because paper medical charts changed over time, creating difficulties when attempting to compare information—healthcare providers now can standardize both data and care.

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Other improvements come with eliminating duplicate records, and from electronic charting and discharge, electronic signatures, patient check-in, and access to referring physician information.

The physician inbox of many software systems can display documents to sign and review, phone messages, and consult orders. In the past, this all required a large stack of folders, pink callback slips, and other paper forms. In addition, instructions to nurses tend to be clearer and more precise with an EMR-EHR.

The Gemini Project at the **University of Illinois Chicago Medical Center** (Davies winner, 2001) conducted a study to showcase the process improvements its EMR-EHR has helped achieve, and it may be the best example among Davies award winners. The hospital system—including a 450-bed facility, two outpatient centers, and 12 primary care centers—found the following improvements:

- The number of patients seen without a medical record on hand was reduced by 40 percent, and physicians spent 30 percent less time looking for charts.
- More than 5,000 annual radiologist hours went to patient care, which meant that each radiologist spent about five fewer hours per week reviewing medical records.
- Physicians saved five hours per week reviewing resident orders, because they can be accessed on computers in real time.
- Chart pull requests dropped 75 percent and should decrease more as the provider automates it across the entire enterprise.

- The provider eliminated 12 paper forms.
- Prior to installing the system, the campus found patient records were not available 40 percent of the time when the patient arrived for care. The records are now available 100 percent of the time.

**Cincinnati Children's** Davies submission cited a similar list, though it had fewer metrics by which to measure outcomes. Cincinnati Children's experienced:

- An improved patient registration process, because records could be prepared digitally before the patient arrived.
- Reduced documentation required for allergies and other health issues.
- Reduced time to take and receive radiographs.
- Increasingly accurate patient information, reducing the need for physicians and nurses to call patients for clarification.
- Reduced turnaround time for medications. Administration times improved 18 to 88 percent, depending on the medication cycle stage.

Other award winners saw additional process improvements:

- Duplicate testing dropped dramatically. At **Maimonides**, ancillary tests decreased by 48.9 percent, urinalysis by 41.6 percent, microbiology by 40.6 percent, and hematology by 6 percent.
- The software recognizes most patients. At **Citizens Memorial**, the software has records on 92 percent of patients the institution sees. At **Queens**, 100 percent of the patients have electronic records. Previously, in the paper medical chart environment, Queens' staff could only find charts for 70 percent of patients.
- Warnings, or alerts, improve care. At **Ohio State**, a five-hospital system, the EMR-EHR's alerts and flags cue physicians to orders requiring co-signatures, abnormally high or low results, changes in a patient's location, and orders to ancillary departments such as radiology, laboratory, pharmacy, dietary, and respiratory therapy.
- **Cincinnati Children's** found a 52 percent decrease in time spent on the medication cycle entering orders, receiving orders, shortening the care process for patients and staff.
- At **Citizen's Memorial** and at other providers, physicians now have the option of entering orders at hospitals or long-term care facilities, or even remotely, and many choose to do so: "Orders are compared in real-time with rules and standards designed to reduce errors and improve quality of care, including medication interactions, allergy checking, presentation of pertinent results, and order-specific rules."

- The time to deliver medications dropped dramatically. At **Maimonides**, it fell by 68 percent, from 276 minutes on average to 88 minutes. **Ohio State** saw the time it took to obtain medications from the pharmacy drop from 3 hours and 14 minutes to 1 hour and 22 minutes.

### *Communications*

The presence of EMR-EHRs greatly enhances communication among providers and patients. Something as simple as legible documentation, rather than physician scrawl, helps pharmacists offer the right medications at the right dosages. Something as complex as decision support reminds doctors to suggest patients get Pap smears, mammograms, blood-pressure checks, vaccinations, and so forth. Communications can make a world of difference in a large provider environment.

The Davies' award winners cite many examples of increased communications:

- **Citizens Memorial** physicians send a "Message to Nursing" with specific instructions or information on a patient. The hospital system's EMR-EHR is available from any of its care locations and any hospital department, eliminating the need for transport of documents. The physician desktop also alerts staff of prescription refill requests and laboratory results.
- **Queens Health's** EMR-EHR allows for sharing of documentation by all staff. The nursing staff's "documentation of vital signs, immunizations, fingerstick glucose testing, PPDs, etc., are available online at all times across the continuum of care," states Queens' submission. The process "helps eliminate duplication of effort, and, more importantly, encourages users to read what other caregivers have documented."
- **Cincinnati Children's** uses different font color (blue) to inform nursing they have a new order; it changes to black when the order is completed. Electronic order entry involving respiratory orders can be combined with pager notification to alert, for example, the radiology department of the need for its services.
- **Maimonides'** submission notes that laboratory and radiology results "are distributed electronically within 12 to 48 hours to a nursing pool where results are screened." Abnormal results go to the physician of record. Traditionally, that process took a week and the chance that abnormal results would be missed was much higher.
- The **University of Illinois' Chicago** campus reports "vastly" improved communications between the emergency department and primary care physicians and between nurses and insurance companies.

**EMR-EHR software assists greatly in hospitals reaching for full compliance with a host of regulatory issues, which will, in fact, lead to greater patient safety and better care.**

### ***Regulatory Compliance***

Hospitals are required to document their care to several important regulatory bodies and to their own oversight committees. They must also abide by new federal guidelines providing for patient privacy.

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The ability of physicians and nurses to document every patient encounter in the EMR-EHR, to view a patient's entire history in a consistent format, and to see best-practice treatment protocols helps enormously in complying with the myriad of healthcare regulations.

An additional point is worth making. By employing passwords and other security protocols that offer differing levels of failsafe user clearance, computerized health records can effectively restrict access to patients' confidential records. This makes complying with the Health Insurance Portability and Accountability Act of 1996 (HIPAA) that much easier. Later Davies winners often cited compliance with HIPAA as one of the chief advantages of their EMR-EHR deployments.

But HIPAA is not the only law providers need to abide. Those protocols promulgated by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), the Centers for Medicare and Medicaid (CMS), state agencies, and others that have oversight of hospitals and clinics also must be observed.

Again, the data-crunching capabilities and alert systems inherent in EMR-EHR software help nurses and doctors comply with national and institution-based protocols. It's the tap on the shoulder to check twice, or do again.

Few award winners outlined in as great a detail as **Ohio State University Health System** the EMR-EHR's influence on regulatory compliance. The hospital found the EMR-EHR:

- Advanced full compliance with institutional policies and bylaws regarding do-not-resuscitate orders and restraint orders.
- Required staff to get a signature on an informed consent form from all patients undergoing chemotherapy.
- Allowed staff the ability to run daily reports for the Ohio State Pharmacy Board to exhibit compliance with a state directive that requires physicians to confirm their identities before administering controlled substances to patients. The hospital generates daily reports on quality initiatives for the Ohio Department of Health.
- Helped Ohio State comply with JCAHO and CMS mandates requiring allergy assessments and diagnosis upon admission. The EMR-EHR offers electronic discharge instructions by use of ICD-9 codes for primary admission diagnosis and discharge diagnosis. It also prompts certain questions to help charge entry

clerks determine Medicare eligibility. The hospital's compliance is at 100 percent for co-signatures on all verbal orders.

Other award winners cite similar compliance advantages:

- **Cincinnati Children's** saw orders permanently unsigned by physicians drop from 40 percent to around 10 percent and witnessed a corresponding drop in verbal orders. Patient documentation was not previously performed in a timely manner and verbal orders for controlled substances were commonplace. With an EMR-EHR in place, the hospital saw a 24 percent reduction in verbal orders for controlled substances. Compliance with pain assessment protocols also jumped substantially.
- At **Queens Health**, completion of JCAHO-mandated summary lists—a required log of patient diagnoses, significant invasive and operative procedures, allergies and adverse drug reactions, and medications taken by patients—dropped from 3.7 percent in a paper environment to 100 percent during a 6-month EMR/EHR conversion period.
- **Maimonides Medical** calls “aggregated data and information” a “very powerful” application. The hospital uses reports in the OB/GYN to improve performance and submits results to the state's Department of Health–Statewide Planning and Research Cooperative System, as mandated.

### **Hard Return on Investment**

The definition of hard return on investment on EMR-EHRs involves two measurements: Quantifiable returns that can be demonstrated in financial terms and process improvements that would suggest cost savings that may fit an identifiable—or measurable—metric.

Physicians and nurses do not always measure their work with the kind of metrics available in other industries. Providers simply have not had the tools to conduct a thorough vetting of hard RIO.

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But with more sophisticated electronic systems now available to healthcare, the ROI equation is changing. These systems facilitate hard ROI data capture using more comprehensive methodologies.

In general, hard ROI from EMR-EHR installations can be grouped into three major categories: patient flow, materials and staffing reductions, and billing improvements. Some increases are astonishing; others show marginal—if still important—savings, or higher reimbursements.

The facts and figures only reflect what was submitted in award applications—the assumption being that a system in place just a few years will demonstrably boost savings, assist in reimbursements, and diminish new staffing requirements.

Evidence of hard ROI is much richer in ambulatory care settings, perhaps because the data involves a smaller number of physicians and patients, and smaller, less diffuse budgets.

Therefore, running the numbers and getting a feel for cost savings, patient flow, and billing yields a richer palette of statistics than is evident in larger hospitals and practices. See the ROI section of the ambulatory care white paper for more details.

### ***Patient Flow***

Only a handful of institutions looked at data that suggested an EMR-EHR installation could generate greater patient volumes, thereby increasing revenues and profitability. But there is anecdotal evidence that EMR-EHRs help healthcare providers move patients more efficiently through the care continuum. In fact, inpatient stays are generally shorter, and patients receive better care, on average, with an EMR-EHR in place. Hard data is, frankly, slender on this issue but several Davies winners report the following:

- **Citizens Memorial** saw net patient revenues increase 23 percent after the EMR-EHR implementation. It believes the EMR-EHR has had a positive impact on patient volume.
- Patient visits to **Maimonides'** emergency department increased from 57,795 in 1996 to 77,118 in 2002. Meanwhile, the average length of stay plummeted from 7.26 days in 1995 to 5.05 days in 2001, one full day less than the New York City average.
- **Ohio State's** data revealed a decline in the length of inpatient stays in a majority of services it offers, from transplant surgery to neurology.

### ***Reducing and Reallocating Resources***

Because EMR-EHRs reduce the need for paper, transcribers, and space for medical records, their introduction can reap immediate financial rewards. However, it's notable that a reduction in staff may not always occur, because employees who once performed data entry, for example, might be deployed in new areas. That kind of employee shifting, common at hospitals, alleviates the need to hire new employees.

Radiology is another area in which resources have been dramatically reallocated. Paper and non-digital film requires labor to organize, chart, file, and find, but computers perform the same tasks in seconds, not minutes or hours. Thus, digital radiology has been a key source of savings in many institutions.

Here are more examples of effective, EMR-EHR-inspired resource shifting:

- **Evanston Northwestern** increased volume with its EMR-EHR equivalent to eliminating 65 full-time employees throughout the corporation, or \$4 million. The hospital reduced personnel in the emergency department, in medical records, and in billing, as well as decreased overtime and temporary employee expenses. The total for all staff-related reductions equals \$7.78 million. By eliminating forms, a scheduling system, and dictation, the hospital saved another \$1.94 million.

- Implementation of Picture Archiving and Communications System (PACS) and voice recognition, along with a radiology Information System, saved \$10.5 million at **Maimonides** over five years by eliminating film, transcription, film jackets, and some hardware and software maintenance.
- **Heritage Behavioral Health** (Davies, 2001) saved \$473,859 over three years, in the following areas: \$211,000 for transcription and documentation; \$146,000 for chart audit paybacks; and \$117,000 for back-office staffing reductions.
- The **University of Illinois at Chicago** reallocated \$1.2 million of nurse time from manual documentation task to direct delivery of patient care. Charge nurses spent 2.75 hours less per week on medication administration, while caregiver nurses reported an hour less per week on this task after EMR-EHR implementation. Another \$172,800 was saved in the Health Information Department after chart assemblers increased their productivity as a result of online results and order access.
- **Queens Health Network** employed PACS and voice recognition systems, saving \$993,000 per year at one of its hospitals, Elmhurst Hospital. Savings accrued from reductions in film, supplies; file-room space; personnel services for scheduling, filing, making appointments, relaying results, and length of stay reductions also improved throughput. The hospital dropped five full-time positions and eliminated phone calls to obtain results. The radiology department at one Queens hospital saved another \$164,000 in transcription costs, while its other hospital saved \$206,200 in related expenses.
- At **Ohio State**, the implementation of PACS had equally impressive results, reducing film costs by \$1.3 million annually. The hospital system also saved \$70,000 collectively on paper, nursing time, and wasted medications, the last which resulted from a 50 percent reduction in medication errors and the complete elimination of transcription errors.

### ***Billing Improvements***

Clearly, having an EMR-EHR system clarifies the often-messy world of billing. Capturing charges is easier and is in real-time, so submissions to insurers can be completed digitally and within hours of treatment, rather than days. Studies show as much as 50 percent of care in some hospitals never gets submitted for reimbursement. The EMR-EHR function helps providers keep track of treatment and assists in coding for accurate billing.

**Capturing charges is easier and in real-time, so submissions to insurers can be completed digitally and within hours of treatment, rather than days.**

Davies award winners cite billing improvements, through more complete bills and better collection, as hard ROI that eventually pays for the software. Here are a few examples:

- **Evanston Northwestern** saw a \$2.5 million increase in revenue after solidly linking charge capture directly with orders. Improved coding edits and better emergency department charge capture added another \$134,000, and flexible

editing of claims contributed \$48,000. A cumulative revenue increase of \$2.68 million resulted from EMR-EHR use, and co-pay collection rates increased from 21 to 50 percent.

- At **Queens Health Network**, the claims denial rate decreased in one managed-care contract from 35 percent in the first quarter of 2001 to 21 percent in the first quarter 2002; another large facility Queens owns experienced a denial drop from 43 percent to 26 percent. Elmhurst, a Queens Health hospital, saw an increase in revenues from radiology of \$306,000 during the first year of the EMR-EHR.

- **Heritage Behavioral Health**, an organization with several outreach programs, repaid \$9,477 in 1994 to payers for non-compliant documentation or ineligible services. The figure in 2001, after the EMR-EHR implementation, was \$774. The system saved another \$39,000 on data entry in billing through staff reductions.

- **Citizens Memorial** experienced a decrease in accounts receivable for its physicians from more than 80 days to fewer than 50 days, by centralizing billing, charging functions, and **consolidating** the databases of 16 clinics. Automatic charge capture increased revenue \$34 per patient. Claim denials have been reduced.

- **Ohio State** improved cash flow by allowing expedited payer payments to patient accounting systems. It electronically sends accounts to vendors for immediate follow-up and collection and after conducting front-end edits to meet payer requirements.

- **Heritage Behavioral Health** had the misfortune of having to use three separate data sets for recording and billing for Medicaid and for other state and federal agencies. It solved the problem by building a single integrated set of data elements in the EMR-EHR, which translates internal codes into codes for funding sources.

- **Cincinnati Children's** improved its durable medical equipment charge capture by 8.5 percent, resulting in greater revenue from that charge.

- **Maimonides** watched as profits rose from \$761,000 in 1996, before the EMR-EHR, to \$6.1 million in 2001 after implementation, much of it a result of improved bill collection. The hospital attributes one-fourth of that revenue increase to the EMR-EHR and estimates it has enjoyed a 9.4 percent return on investment annually. Research by the hospital suggests that it has had a 4.84-year payback on its \$43.8 million investment.

## Appendix

### Davies Award Winners

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

## **2005**

Name: Citizens Memorial Healthcare

Location: Bolivar, MO

Practice Size: one hospital, 5 long-term care facilities, 16 physician clinics, 3 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 ER visits; 2,776 surgeries, 464 births, 14,455 home case visits

Vendor: MEDITECH

## **2004**

Name: Evanston Northwestern Healthcare

Location: Evanston, IL

Practice Size: 3 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; 87,000 emergency, 20,303 inpatient, 11,717 home care visits

Vendor: INVISION, Siemens Medical Solutions Health Services Corp.

## **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: 2 hospitals, 11 medical clinics, 6 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 Chicago Medical Center at Chicago  
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, 400,000 outpatient  
Vendor: HNA Millennium, Cerner Corp.

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: 5 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 ER 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, 21,00  
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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