



Trends-in-Medicine

March 2004

By Lynne Peterson

SUMMARY

Healthcare IT spending is starting to increase – the early stages of a new spending *ripple*. However, 2004 hospital budgets are up only 6% from 2003, with future increases expected to be in the same range. ♦ PACS is taking off, and interest in CPOE is high, but CPOE may lag as hospitals prepare for it by implementing advanced clinical systems. ♦ Sources are hopeful there will be federal government dollars behind the rhetoric of Bush administration officials. ♦ There is more interest in integration than interface engines, and hospitals want enterprise-wide solutions more than a patchwork of “best of breed” systems. ♦ CIOs implementing Siemens’ Soarian are all very enthusiastic about it and not concerned about roll-out delays. ♦ Kodak may be the company to watch. It is about to make a big push in healthcare IT, especially PACS.

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HEALTHCARE INFORMATION AND MANAGEMENT SYSTEMS SOCIETY

February 22-26, 2004

Orlando, FL

This was the largest meeting of the Healthcare Information and Management Systems Society (HIMSS) ever, with a record number of attendees as well as exhibits. There were 715 exhibitors (up 4% from last year), and 301 of these were new exhibitors. This report looks at:

- The spending outlook.....page 2
- The provider view..... page 3
- The technology..... page 4
- Web design.....page 6
- Transcription and voice recognition....page 7
- E-prescribing.....page 7
- Electronic Medical Records (EMRs)...page 8
- The vendors..... page 8
- The future.....page 14
- Miscellaneous items..... page 16

The annual HIMSS Leadership Survey of 307 CIOs, sponsored by Superior Consulting, found:

- IT budgets for 2004 are higher than 2003 for 72% of respondents, with a 6% average increase.
- Patient safety and HIPAA are top industry priorities and are considered almost equally important.
- Bar coded medication management, clinical information systems, electronic medical records (EMRs), and computer physician order entry (CPOE) systems are top future applications. However, CPOE interest dropped compared to 2003. A speaker explained, “There is a commitment to CPOE...In many cases, the prerequisite is laying in other systems...There is no drop-off in commitment to CPOE.” Another speaker said, “CPOE was at top of the ‘hype cycle’ last year...I think what’s happening is that folks realize there is a whole bunch of stuff they have to do before CPOE...It’s not that they won’t do CPOE, but they can’t do it first...They need a clinical data repository, bar coded medication, etc., before CPOE...So, I think a lot of CIOs are not turned off on CPOE, but they are not planning on implementing it first...They will get to it, but it is not a first priority.”
- The trend is to less outsourcing.

- An internal breach of security – more than an external breach – is a major concern with respect to electronic medical information.
- PDAs, bar coding, and speech recognition are considered top technologies of the future. An expert explained the increased interest in speech recognition: “Speech recognition worked well in radiology, but it is not in fruition in the ER...so hospitals that haven’t done speech in laces where it works and is proven are probably getting around to implementing it.”

IT Priorities

Issue	IT Priority for 2004	IT Priority for 2006
Upgrade security/HIPAA compliance	48%	25%
Reduce medical errors	47%	48%
Replace/upgrade inpatient clinical systems	44%	33%
Implement wireless system	37%	23%
Implement EMR	33%	43%
Upgrade network infrastructure	32%	21%
Process/workflow redesign	32%	27%
Improvement of IT department	29%	17%

Barriers to IT Implementation

Issue	Respondents
Lack of financial support	23%
Vendor inability to effectively deliver product	14%
Proving ROI	13%
Difficulty achieving end-user acceptance	11%
Lack of staffing resources	10%

Status of EMRs

Status	Respondents
Fully operational	19%
Installation begun	37%
Development plan to implement	23%
No plans yet	21%
Don't know	1%

Key IT Applications for Next 2 Years

Issue	Respondents
Bar code medication management	52%
EMR	52%
Clinical information systems	52%
CPOE	50%
Clinical data repository	46%
PACS	43%
Enterprise-wide clinical information sharing	40%
Point-of-care decision support	38%

IT Staffing Needs for Next 2 Years

Position	Respondents
Network support	31%
Clinical transformation	25%
Clinical champions	24%
Clinical information	24%
Data security	21%
Application support	19%
Process/workflow design	19%
PC/server support	16%
Help desk	16%

Top Business Issues for Next 2 Years

Issue	Respondents
Reducing medical errors	64%
Cost pressures	54%
Patient satisfaction	44%
Improving quality of care	43%
Improving operational efficiency	41%
Clinical transformation	37%
Medicare cutbacks	35%
Nursing shortage	34%

THE SPENDING OUTLOOK

Healthcare IT spending is just starting to increase, and most sources believe the industry is in the very early stages of an increase in IT spending. However, a “ripple” may be more correct description than “wave.” As noted in the HIMSS survey, hospital budgets only increased 6% this year from last year, and sources all predicted that a similar trend will occur for the next few years. Sources agreed there will be steady healthcare IT (HCIT) spending for the near future, but no huge spending increase.

- A CIO said, “CPOE and EMR are connected, and the wave has already started, with another four or five years of spending ahead – but it is really contingent on the government.”
- Another source said, “Spending will go up, but it is difficult. Our ROI is pretty reasonable, but it’s a challenge to spend when you are trying to keep healthcare costs down...It is very difficult to find the money, but you have to or you can’t compete.”
- A West Virginia CIO said, “We just outsourced all our IT to Siemens as a way of bringing IT costs down. With outsourcing, we expect our budget to go down over time, though probably not right away...Our IT budget will continue to get squeezed. Times are tough all over.”
- An Ohio CIO said, “Budgets have been tight since 2000, but we are starting to come out of that and see budget increases.”
- An Indiana CIO said, “Our budget will be flat while we catch our breath...There is a different focus now in IT budgets but not necessarily more money. The market in IT is as disparate as in healthcare insurance.”
- A consultant said, “Spending is getting ready to increase. We won’t really see it until late 2004 or 2005, but I believe it is happening.”
- Another consultant said, “The polls all indicate that an up tick has started, and I believe that. I think there will be a new wave of spending – not on system replacements but on advanced clinical systems to support clinical delivery.”

Key spending areas appear to be: advanced clinical systems, CPOE, and EMRs. Randy Thomas, a consultant with HealthLink, said she expects an increase in three areas: IT strategic planning, pre-implementation planning, and implementation systems. She added, "Large hospital spending will be on enterprise clinical systems, but smaller hospitals may try to solve part of the problem with smaller vendors." An AstraZeneca official said, "Clinical automation is the single most important HCIT focus. EMR – or whatever you call it – has to be right, and all else will flow." He said his company would be willing to help fund EMRs if the government would allow pharmas to do that, and he believes other pharmas increasingly agree with this. He said helping promote migration to EMRs would be good for AstraZeneca in three ways:

- a. Making outcomes research easier, which would help demonstrate value of therapies.
- b. Reducing the cost of clinical trials.
- c. Lowering promotional costs through less sales rep detailing and direct-to-consumer advertising.

FDA Commissioner (and soon-to-be CMS Director) Mark McClellan and HHS Secretary Tommy Thompson have been urging advances in healthcare IT, and sources hope that there will be federal dollars to back that up. A Pennsylvania CIO said, "I hope the federal government steps up with money, especially for rural areas, and I believe they are beginning to understand that rural healthcare needs help...Grants are good, but they are not enough, and it costs a lot of money to write grants...University medical centers don't need as much help, but we all need to be able to implement. It won't work if only big groups can do EMRs." A Michigan doctor said, "The government has to support HCIT and it will...Rather than subsidizing doctors to do IT, I think it will penalize those who don't." A pharma official said, "McClellan is a stunning man. I hope his move to CMS will mean more money for HCIT. But I'm also desperately sorry to see him leave the FDA." A consultant said, "If the government has a lot of unfunded mandates, IT spending could be harmed by a backlash effect."

Democratic Congressman Patrick Kennedy of Rhode Island unveiled proposed new legislation at HIMSS that he claimed would "transform the technological backbone of the American healthcare industry by 2015." Kennedy's bill, called "The Quality, Efficiency, Standards, and Technology for Healthcare Transformation Act (QUEST)," would implement a fully wired, integrated, paperless healthcare system by 2015, with financial incentives to reward providers for quality improvements.

THE PROVIDER VIEW

Hospitals

Despite uncertainty over reimbursement and the growing number of uninsured Americans, hospital IT budgets are going

up, though modestly. CIOs questioned about their budget agreed with the HIMSS survey estimate of a 6% annual increase.

What are hospitals going to be spending money on? Advanced clinical systems. Hospitals are interested in moving to CPOE (*See page 4*), but many CIOs said they need to upgrade their clinical systems first. A speaker said, "Despite automation, 70% of billing today is manual...Where we are heading is the realization that it is what goes on in clinical care that drives what goes on financially, so the workflow focus now is on billing systems."

Thus, for the near future, CIOs said they are more interested in enterprise-wide solutions and less interested in buying different "best of breed" systems for different departments or functions – until and unless there are better standards for those programs to make them more compatible. A speaker said, "If standards are adopted, it could be that best of breed will work." A CIO said, "No one platform can do this (interface with everything). When the various vendors become more compliant with standards, you won't need an integrator." Another CIO said, "The industry is going back to an integrated platform rather than best of breed." An expert said, "Industry has moved to a core vendor approach, which is knowing you can't get everything from one vendor. You can find a vendor with a great suite of clinical applications, someone with financials, and someone with supply chain plus some specialty systems for cardiology, etc. That is a manageable number to get to work together. Integration has become the nirvana of systems – where data is seamlessly transferred within one environment...Where we are today is moving toward a common database infrastructure, which is not necessarily a single database, but maybe a single technology...and the use of more object-oriented technologies and workflow engines."

Most of the major vendors claim their systems are fully integrated, but experts disputed this. What appears to be integration is really interface engines connecting disparate applications within the system, they argued. An Arkansas CIO said, "Several vendors claim to have a broad unifying platform (interface) for interfacing disparate hospital IT systems, but I don't see that. Most vendors are too proprietary for that." Another CIO said, "You could argue that the vendors don't provide true integration, but that they have a patch of things not fully integrated."

Many hospitals still have disparate systems that they connect with interface engines, and CIOs do not expect to avoid the use of interface engines in the future since they do not expect their "core" vendor to provide everything. An expert said, "We constantly hear that hospitals don't need interface engines, but they are buying them...Our users are hospitals with lots of different transactional applications. Interface engines are cheaper, easier, and faster than buying a new system."

Sources who are using or purchasing interface engines point to these companies as interface leaders:

- Quovadx (whose product used to be called Cloverleaf)
- SeeBeyond Technology's E-Gate (formerly Datagate)
- Park City Solutions
- Sybase
- Orion Systems International's Rhapsody
- Microsoft's BizTalk

Interface vs. Integration

Issue	Interfacing	Integration
Complexity	Adds layer	Data transfer within application suite
Monitoring for data consistency, accuracy, and integrity	Required constantly	Vendor responsible
Staff and hardware/software resource needs for support	Required	No need
Reports across applications	No	Yes
Execute rules across applications	No	Yes

Smaller Physician Practices

Traditional client/server applications have been out of the reach for roughly half of all U.S. physicians, but that may be changing because:

1. The American Academy of Family Physicians has established a partnership with several leading HCIT vendors to reduce installation costs. This means for the first time doctors will be able to afford these things.
2. New "revolving loan" proposals (similar to FEMA emergency disaster loans) have been making the rounds in Washington, D.C. In the Medicare Act there are provisions built in to:
 - a. Allow the federal government to fund some of this.
 - b. Provide safe harbors from the Medicare fraud regulations that would allow hospitals to buy solutions for doctors and medical groups to buy solutions for their members. These types of purchases currently are illegal, but some will be allowed starting in 2006.
3. WellPoint is giving \$40 million of hardware and software to its providers (*See page 7*). Though most of this will be PDAs, some doctors will get full systems and become computerized for the first time.

Home Health

The new Medicare bill will encourage some IV therapy currently done in doctors' offices to be moved to home care. Sources believe there will be opportunities for IT companies in this environment, but they could not identify which vendors are likely to benefit from this trend. A source said home health companies are well-prepared for this, "Home treatment groups – e.g., Lincare – are all very aware of the technology needs to transform information to all doctors and healthcare

authorities. That group of vendors really keeps an eye on CMS." A McKesson official said, "It is expensive to do point-of-care, and a lot of small home care agencies can't afford to do it. So, either they will go away, or they will do it on paper."

THE TECHNOLOGY

Two interesting approaches urged by a speaker were:

- Creation of a more user-focused IT process. He said, "Implementation is split this year between phased implementation and 'cold turnkey' – or 'big bang'...A year ago, it was hard to get an audience for cold turnkey."
- An exit and/or redirection strategy. He said, "Occasionally, you just have to walk away from something."

Standards

The major need in HCIT is standards, and a key standard appears about to be implemented. A speaker said, The standards questions that have plagued the industry for so long *will* get resolved because the federal government is perhaps the only body with sufficient clout to impose standards unilaterally."

Picture Archiving and Communication System (PACS)

Sources agreed PACS is really starting to take off. A Michigan doctor said, "Radiology is coming along faster than primary care doctors. We need nomenclature and integration, and that is happening. The American Osteopathic Academy of Medical Informatics is hoping to push standards." An Ohio CIO said, "PACS will be the next significant cost center." A West Virginia CIO who uses Agfa for PACS said, "It seems PACS is becoming a staple." A consultant said, "PACS demand is increasing because the technology has evolved to where it is simple and less expensive. It is pushing down to middle-tier hospitals. But there will be a lot of failures because hospitals have trouble adapting."

Computer Physician Order Entry (CPOE)

This has become the star on the top of the Christmas tree, and there is high interest in CPOE, but the actual move may still have to wait. CPOE really requires an advanced clinical system first, and that is one of the reasons hospitals are focusing on enterprise systems right now instead of CPOE.

- A Midwest doctor said, "Everyone is talking about CPOE, but it is not at fruition. It is still a ways away from large implementation. The products still need improvement before there is widespread adoption."
- The CIO of a 300-bed Indiana hospital said, "We want CPOE one of these days, but moving to CPOE is a challenge. I want to put EMR in next."

- An Ohio CIO who has already implemented CPOE said, “We are one of only a few who have implemented it, but our (Eclipsys) system is antiquated, and we are looking to upgrade it (with either Cerner, Eclipsys or IDX – Epic is too pricey).”
- A Tennessee CIO said, “I’ve been in HCIT for 23 years, and there has always been a search for EMR. With the IOM reports in 1999 and 2001, the movement got legs, and now CMS is giving it a push. There is not a CIO here at HIMSS who is not looking at EMR or an advanced clinical system. You need an advanced clinical system foundation because CPOE is the top of the pyramid... CPOE has to integrate with pharmacy, which has to integrate – not interface – with the data repository.”
- A consultant said, “There is an industry argument now that CPOE shouldn’t be first, that the focus should be on advanced clinical systems first...So, if CPOE isn’t first on the list, it is still on the list.”
- A Midwest CIO said, “I’m not sure CPOE is feasible yet for a hospital our size.”
- A Cerner official said, “CPOE has been a driver for a long time, and that has not lost any traction. People are still lining up to buy CPOE.”

The big five CPOE vendors appear to be Cerner, Eclipsys, General Electric, McKesson, and Siemens. A CIO said, “Eclipsys, McKesson and GE were out for us because our integration philosophy is not what they are doing. GE is buying companies, and McKesson still has a lot of ugly things under cover on integration...We chose Siemens over Cerner because Siemens was incumbent, and that saved us some money. The Cerner product was built 10 years ago, and I’d rather be on the beginning of a life cycle than the end when I’m doing a 20-year commitment.”

Cerner (*See page 9*) claims to dominate clinical installs, but competitors disagreed. An Eclipsys official said, “I believe Cerner is saying that it has more clinical CPOE implementations in process than anyone...and I think that is very different than more organizations live on a CPOE system... We are proud of two things: our high adoption rate in both academic and community settings, and that physicians are using COPE...There is no question we have more CPOE sites...but we may not have more implementations going on.”

Medication Delivery/Bar Coding

Bar coding is a definite trend. During HIMSS, the FDA announced that it will mandate bar codes on the labels of most prescription drugs and some over-the-counter products. The rule also requires machine-readable information on container labels of blood and blood components intended for transfusion. A consultant said, “What will happen is stand-alone bar codes will be absorbed into the enterprise systems that Cerner, GE, Eclipsys and others are offering.” A West Virginia CIO said, “We are implementing medication

administration and then CPOE. We will use Siemens for bar coding medications. For patient and employee identification, we just print bar codes on a Lexmark printer.” WellPoint CIO Ron Ponder said, “We are employing bar coding extensively in all of our processes and paperwork...We are determined to track claims so we can find them...I spent 17 years at Federal Express, and I’m convinced the same technology and logistics can be used in transactions in healthcare...and bar coding is certainly a cornerstone of that...but we need to look outside the (healthcare) space for the technology...We are not benchmarking to healthcare but to the financial sector... because we want to be at that level.”

Companies mentioned as leaders in medication bar coding include:

- AmeriSource Bergen’s **Bridge Medical**.
- **Baxter**. So far, Baxter has about four live installs, with early adapters mostly smaller (≤150 bed) hospitals.
- **IntelliDot**. This is a new company, founded by the same people who invented Cardinal’s Pyxis. The system uses a rugged, wireless, hand-held device that allows caregivers to quickly and efficiently check medications. It is simpler and much more basic than a PDA, but that’s its advantage – it is easy to operate but still provides medication verifications, lab results, and access to other critical information in the network. The device is a little clunky, but an IntelliDot official said it will get smaller and eventually incorporate a cell phone. The official said, “There are two reasons that only about 3% of hospitals have implemented bedside bar code-checking: (1) cost per bed, and (2) nurse opposition. The average age of a nurse is 48, and there is a nursing shortage.” Reportedly, IntelliDot has at least six installs in progress.

CIOs who looked at this technology were impressed. A Connecticut CIO said, “It’s neat technology.”

- **Symbol Technologies**, which provides the hardware and software for many bar code systems, including McKesson, Cerner, Eclipsys, Pyxis, Baxter, and Bridge.

Laboratory bar coding also is improving. **Becton Dickinson** announced at HIMSS that its BD.id Patient Identification System, reduced specimen collection errors by 99.95% at The Valley Hospital in Ridgewood NJ. BD.id combines bar coding and laboratory specimen collection. The system is designed to ensure that blood and other samples are collected from the right patient, are placed in the proper container, and are labeled correctly. The system includes a handheld computer that acts as a portable data terminal and has a built-in scanner for bedside patient identification. The system captures and stores each specimen collection event and helps to assure that the patient, test order, and time of collection are correct. There is a bar code for the patient's wristband, and that is matched against a printed bar coded specimen label at the bedside. When put in its cradle, the BD.id System

synchronizes with the laboratory information system through a bi-directional interface.

Wireless Mobile Technology

Wireless mobile technology is one of the hottest things right now, and many people believe PDAs will be the initial way this gets started. One estimate is that 60% of doctors currently own a PDA.

How PDAs Are Used

Use	Approximate %
Personal	75%
Rx reference	68%
Email	28%
Scheduling	24%
Patient census	22%
Prescribing	20%
Web browsing	8%

There are numerous applications for wireless mobile technology. Sprint Healthcare Solutions, for example, was featuring the work it is doing with a variety of vendors in these areas:

- Hospital rooms with advanced "patient stations" that integrate entertainment, communications, and electronic medical information.
- Communications solutions that allow doctors to stay in touch, access records, and interact with patients using more than five different devices across two or three different wireline/wireless networks.
- Interactive mobile applications and messaging applications that allow doctors to remotely monitor patients and receive IM messages as alerts on wireless handheld devices.
- Wireless access to stored data. A Sprint official said, "We need a large re-education in the marketplace on the safety of wireless in hospitals...Wireless phones are not on the same frequency as medical equipment, so they are safe in a hospital."
- Telemedicine.

Sprint claims to have developed unified communications systems that makes it possible for a number of different computing devices to be used in a holistic way, combining voice and data communication in a secure and customizable way. This can be done through either:

1. Technology that follows a user from location to location, forwarding calls and data based on the device that is most appropriate and tailored to the user's wishes. This technology allows a user to set personal preferences for routing and prioritization.
2. A network-based system with local and long distance voice services over data networks, or

Instead of introducing these products itself, Sprint has partnered with other vendors, such as:

- Millennium, in critical care
- InSite One for digital image archiving in lieu of or in conjunction with PACS. This is designed for after-hour reading of records or for referring doctors, but some customers are using it for a PACS starter. If a hospital has PACS, this can still be used for archive management.
- Cardinal, on its bedside Pyxis Patient Portal.

Emerging technologies on which Sprint is working include:

- My Food Phone for dietician consults.
- Advanced conferencing.
- Location-based service, where the phone finds you wherever you are.

WEB DESIGN

Hospitals are reaching out to patients and their community with websites, and several companies have product offerings in this niche. These companies use a variety of web applications, and all are considered good, but XML is viewed as "necessary," and .NET as the "up-and-comer." These web tools include:

- Cold fusion, which sources do not consider passé
- XML
- .NET
- SOAP, which a source called "a critical component"
- Java

Vendors include:

HEALTHVISION

Almost 300 hospitals use HealthVision for web-based delivery of patient data and clinical applications.

MEDSEEK

This is the leader in this space, with more than 400 healthcare clients. An official said, "The challenge is hospitals who don't invest in strategy, so there is no roadmap to make the vision tactical." Another official said, "Integration difficulties depend on the hospital system; MediTech is more difficult (to work with) than Cerner...but we are vendor neutral."

REDDOT

This company is headquartered in Germany but has subsidiaries in the U.K., U.S., Italy, and Poland.

SYSTEMS ALLIANCE'S SiteExecutive

The company's healthcare clients generally fall in one of three categories: healthcare education, not-for-profits, and trade/user associations. Current clients include Johns Hopkins, Greater Baltimore Medical Center, and the Medical University of South Carolina. Systems Alliance claims that

one of its advantages over MedSeek is better readability or pickup by the search engine Google. A new version, 3.3, was due out at the end of February 2004.

A Systems Alliance official outlined some of the challenges in web design for a hospital:

- **Meeting the varying needs of different departments.** He said, "The nature of the technology allows for distribution across the organization, but there are often a lot of competing requests, so implementation is not just a technology question, but it also requires building consensus. For example, public relations may have one objective, and laboratory may have another. Typically, we come in through one department, but that department wants other departments to contribute to the budget, so we have to re-sell (our product) to other departments."
- **Consensus.** He said, "We find ~50% of implementation is planning – how to organize the content, with different departments wanting it organized differently."
- **Leadership.** Any leadership changes during the implementation process can slow things down.
- **Decentralization.** Academic medical centers tend to be decentralized.
- **Organizational ambiguity.** He said, "This is our biggest challenge – a website owned and managed by committee, with no clear voice. The people can be very capable technically, but they may not have marketing savvy... We need to know the client's goal or vision."

TRANSCRIPTION AND VOICE RECOGNITION

Numerous CIOs said one of the key things they were shopping for at HIMSS was new dictation systems. Generally, they were looking for voice recognition to be a part – but not the most important part – of the new system. The vendors who appeared on the short-list of most CIOs included:

- Dictaphone
- Lanier

Speech recognition is getting better, and it has proven itself in some areas, such as radiology, but it is not ready for every department. An Eclipsys official said, "Speech is coming into our world, but not in the near term." A Philips official said, "We'll see more speech recognition... We've seen some improvements in healthcare, but we are not done yet... There are areas where we can do (voice recognition) successfully – for example, in radiology – but other areas can be much more difficult."

E-PRESCRIBING

AllScripts has the largest installed base for e-prescribing, but there are a number of competitors, including:

- Dr. First
- Ramp Corp.'s HealthRamp
- ZixCorp (formerly PocketScripts)
- RxNT, which did not have a booth at HIMSS

e-Prescribing is about to get a big boost from WellPoint. The nation's second largest health insurer announced its iDOC (Integrated Digital Office Connection) initiative through which WellPoint is giving \$40 million worth of hardware and software to 20,000 of its high volume providers in California, Georgia, Missouri, and Wisconsin. WellPoint CIO Ron Ponder said, "I believe that connectivity to the physician is the most important issue we have... and the most important challenge... Today, only about 5% of physicians are using e-prescribing, but three billion prescriptions are written annually... We estimate from studies that around 55 million of those prescriptions are written with an error... This is at least a prime of the pump in getting doctors connected."

Ponder insisted this is not an investment by WellPoint. He said, "We can't recoup any of this... There is no ROI on this at all... We personally expect nothing back out of this." Doctors will be able to keep this equipment even if they later drop out of the WellPoint network.

WellPoint's goal is to:

- Improve physician connectivity overall.
- Reduce the administrative burden on physicians and the cost of that work.
- Increase patient safety and patient service.

The program offers two options:

1. Small offices and doctors who are not yet totally on the Internet can opt for a fully-loaded Dell computer, with free Dell installation, training, and a three-year service warranty. This system will give doctors immediate access to the internet and to any health plan's system, so they can check eligibility, submit claims on line, etc.
2. Doctors with a more sophisticated office can opt for an e-prescribing solution – a PDA with wireless access. Ponder said he expects this to be the choice of the majority of doctors. Dell will furnish all the hardware, but Microsoft is putting the software on the devices and will stand behind the functionality and scalability. The choice of software has not yet been announced, but it is expected to be chosen from several different e-prescribing vendors, with some Microsoft additions.

The first letters are going out to doctors now, and the first equipment shipments are expected to occur by the end of March 2004. Other WellPoint doctors who do not qualify for free systems can order the hardware/software at a negotiated “healthy” discount, though Ponder wouldn’t say how much that discount will be.

Ponder said Dell was chosen as the hardware vendor because of logistics and supply, “Dell is one of the pre-eminent vendors in being able to supply, distribute, maintain, and support a product...And they are people we trust.”

Perhaps this is the beginning of a trend; Horizon has started a similar program in New Jersey, and three other carriers reportedly have called Microsoft. Ponder said, “I think we touched a cord out there...No one expected this to happen...The opportunity to make this better slowly is there – if we can just get another few companies out there to do this, we can get it to 100,000 of the nation’s 600,000-700,000 physicians.”

ELECTRONIC MEDICAL RECORDS (EMRs)

Less than 5% of doctors currently use electronic health records (EHRs). There is some confusion over whether the terminology should be EHR, EMR or computerized patient record (CPR). For purposes of discussion here, the term EMR will be used to cover all three. An NIH official said, “EMR may be too generic to work. Vendors already have EMR, and they will have trouble adapting.” An Arkansas CIO said, “We are shopping for an EMR system, and we want best of breed. We are looking at MedPlus, McKesson, Eclipsys, and LanVision – the bigger players, not Mom & Pops.”

Former House Speaker Newt Gingrich said EMRs should become operational – and portable – by September 1, 2004. He suggested doctors start using EMRs for all new Medicare age-65 physicals. He said, “This is not rocket science...I sat down with IBM, which ran a 184,000-person beta test in England last year, I talked with Epic, and I looked at Tricare (a military retiree insurance plan). The VA has had a system for 10 years. We are long past proof of theory...There is no reason technologically that we can’t have a full blown system up and running by January 1, 2005...Almost overnight we would have a full-blown system and add to it over the next four to five years...The British believe you can launch this for less than \$10 per person and sustain it for less than \$.25 per person. We will save 10 times the cost in the first years and 30 times the cost in the out years...I don’t think CMS will mandate EMRs, but they may pay substantially more to doctors who use them.”

Gingrich suggested there should be three key components of these EMRs:

1. Interoperability (portability).

2. Baseline owned by the patient.

3. Can be copied by the doctor and hospital.

Asked if the federal government will help fund HCIT, Gingrich said, “Yes, more and more – for national security, bio threat, and health reasons...and because you can’t get the cost out of health unless you go to IT...(CMS Director Mark) McClellan is very, very smart about this stuff...and he gets all this...My hope is at that, at CMS, he will lead the effort to move to EMRs from Day 1...The Bush administration can’t deal with the cost of healthcare...so the pressure to get to some solutions will be very great, and I think IT is a dramatically better solution than just causing people pain.”

Industry officials believe that providers are starting to overcome their resistance to EMRs. An Eclipsys official said, “I feel like the ice has broken on that front...I think that over the past two years physicians have been jumping onboard...I think that is a function of some of the younger people who are GameBoy proficient, etc...I feel like the doctors are really coming along, which is a shift from three to five years ago...And the constituents in the hospital are coming along and pushing this.” A Philips official said, “Our customers and users have changed in terms of understanding...and that has happened in the last five years...(EMRs) will take off in the next five to 10 years for sure.”

CIOs agreed that EMRs are starting to catch on. The CIO of a South Carolina ambulatory care center said, “We’re shopping for an EMR, but we are too small for McKesson, Epic or Cerner, so we’re looking at Imedica, AllScripts and NextGen.”

CLINICAL SYSTEM VENDORS

There has been considerable change and consolidation in the industry over the past 10 years. Some companies left the business, others entered, and some left and then came back. Sources were unaware of any imminent acquisitions or mergers, but one expert suggested that if any company were bought it would be IDX.

CIOs generally have a favorite vendor, but most also believe that there is not much difference among the big players. Sources described all of the major vendors as generally very good. Their advantage appears to be integration, which has replaced “best of breed” thinking – at least for now. An expert commented, “The major players are all pretty solid. We are building a new hospital and looking at integrated systems primary because they are easier, but with more standards that will become less important.”

Sources divided the vendors into three tiers:

➤ **Large multinationals** – General Electric, Philips, and Siemens. The president of Eclipsys was asked whether multinationals have an advantage. He responded, “The

question is whether one company can be everything. Can they be both broad and deep? I'm not sure we know the answer...but history says that this is hard to do...and some of the best things happening in HCIT have been going deep in spaces that create wonderful tools...Eclipsys is not the size of GE or Philips...but there is a role for companies (like Eclipsys) who really focus on some things that are important to industry and go deep and are best of what they focus on." The CEO of Philips' Cardiac and Monitoring Systems division, said, "The marketplace benefits from all of us."

- **Traditional HCIT vendors** – Cerner, McKesson, Eclipsys, and Epic.
- **Others** – including Misys, MediTech, Kodak, WebMD's MedicalLogic, etc.

Past Players in HCIT

Player	Became
Early Players	
SDK	Eclipsys
Lockheed Inserve	Eclipsys
IDX	
MediTech	
Shared Medical Systems (SMS)	Siemens
HBO & Company	McKesson
Cerner	
Next Wave	
Amherst Associates	HBOC
Sunquest	Misys
Transition Systems (TSI)	Eclipsys
Emtek	Eclipsys
HDS	Per Se, then Misys
Here, Gone and May Be Back	
IBM	
American Express	
GE	
Oracle	
McDonald Douglas	

Current Players in HCIT

Current Players
Cerner
Eclipsys
Epic
GE Medical Systems
IDX
McKesson
Meditech
Misys
QuadraMed
Siemens Medical Systems
Companies to Watch
Kodak

Clients Live in 2003 With Currently Marketed Platform

Company	Product	Live 2003 Clients
Cerner	Millennium	246
McKesson	Horizon	1
Eclipsys	SunriseXA	N/A
IDX	CareCast	5
Epic	EpicCare	5
Siemens	Soarian	3

*Source: Cerner

Patient Accounting Offerings

Company	Introduced	Key Technology Elements
Cerner	Millennium	N/A
McKesson	1977 – Magic 1985 – Star	MUMPS
Siemens	1970s – Action 1980s – Invision	Invision DBD on mainframe
Eclipsys	1970s – SDK	MUMPS
MediTech	1970s	MUMPS/Magic O/S
IDX	1970s	Himalaya

*Source: Cerner

Following are comments on specific companies.

CERNER

Several users discussed why they chose Cerner over other vendors. An Ohio user said, "Cerner functionality is strong, but implementation, pricing and methodology (roll-out) is hurting, especially in the small hospital market...I chose Cerner because I liked the functionality, but the challenge is maintenance, support, and implementation." A California user said, "Our short-list was Eclipsys, IDX, and Epic. We didn't consider McKesson. We decided against Eclipsys because it wasn't integrated. We will do COPE with Cerner, which is one reason we bought it...Our doctors want CPOE."

Other CIO comments about Cerner include:

- **Pricing:** An Ohio user said, "Cerner pricing is a struggle for a hospital our size. Cerner needs to have a lower price product for smaller hospitals."
- **Service:** A Midwest user said, "It surprises me that Cerner is so big, but there are so many complaints about it. We just started a new system implementation, and so far, so good." An Ohio user said, "Service has been a challenge."
- **Implementations:** An Ohio user said, "Implementation has been a challenge."
- **Integration:** An Ohio user said, "There have been no big integration issues." A consultant said, "Cerner has pretty good interfaces."

Cerner president Trace Devanny offered some interesting comments on the HCIT environment and his company:

- "The past year has been a tough environment, and we have grown more than all our major competitors combined between 2000 and 2003...As our competitors struggle with the new technology, I believe we will lead."

- “For the first time doctors and nurses are embracing IT.”
- The economic condition of providers is relatively stable, and we expect higher reimbursement in the coming year.”
- “We are looking to other parts of the world to establish ourselves as a leader. About 55% of world healthcare IT spending is outside the U.S. We built the right products for this marketplace, and we think they extend quite nicely to the rest of the world.”

Cerner new system placements were softer than expected last year, and an official said this was due to “a pause” in the first quarter of 2003. He insisted that the pause did not last longer than one quarter and is not being repeated in the first quarter of 2004. He said, “We had a strong finish after the Q1 ‘pause’... We turned on 884 Millennium solutions in 2003, an increase of 63% from 2002... Millennium is industrial strength, with 2,649 live solutions, with 246 clients (a multi-billion hospital group is still one client) and 567 facilities... We will double in 2004 the number of sites we had in 2003... We have over 90% of the application solutions being sold today on current architecture... We have the only new patient accounting system in two decades.” Cerner CFO Marc Naughton added, “We have improving revenue quality and visibility going into 2004. We have a backlog up 25% in 2003 to \$.25 billion, DSO in the range of 110 days, and date-based software payments that incentivize clients to focus on project completion.”

Cerner Business

Area	2003 Revenue (in millions)	Contribution to margin in 2003	Estimated contribution to margin in 2007
Licensed software	\$188	89%	N/A
Consulting	\$233	15%	30%
Technology resale	\$128	17%	N/A
Managed services	\$34	18%	27%
Content and subscriptions	\$16	10%	25%
Support and maintenance	\$210	53%	57%
	2003 Expense	---	Estimated % of total revenue in 2007
R&D	19%	---	16%
SG&A	13%	---	11%

The U.K. government recently awarded five large HCIT contracts. IDX got two, and iSoft and European companies got the other three. A Cerner official commented on his company’s failure to capture one of these contracts: “Although there is disappointment (with our failure to land any U.K. NHS contracts), we had a very successful test, clearly hardening our architecture and positioning Cerner to further leverage this technology... We sensed strongly that the (U.K.) government continued to devalue the IP portion of the contract, which is why we were not so disappointed that we didn’t get chosen, and the terms and conditions were tough

and became a bit of a price game at the end... We are bowed but not broken and will continue to push forward in these markets.”

Cerner Chief Engineering Officer Jeff Townsend offered some insight into where Cerner is headed. He said, “Most of our R&D is going into the physician order entry (CPOE) space... For our next generation of clinician interaction, we are working on:

- **Contextual personalization.**
- **Clinical and financial alignment.** I liken this to the difference between email and phone mail or voice mail. With email, I can see a lot of messages at once, and voice mail is sequential. (In this system), the list of orderable procedures for medications are highlighted and pre-coded. Typical first generations had select an order and submit it, and then an alert would pop up... We now pre-compute alerts by having the patient and the information together... That’s a big, big change there.
- **Built-in outcome indicators.** There is a huge cost to organizations to participate in the outcomes pilots without this feature.
- **Operating systems:** We chose Java/J2EE (thin application) vs. Microsoft’s .NET (smart device which has pre-loaded software). .NET drives up the cost of ownership to an institution.”

Other interesting comments by Cerner officials included:

- “It was somewhat surprising this year that I saw a lot more portal players from the dot.com era resurface.”
- “The road in healthcare is not straight and certainly not smooth... This is rough water... but we like the direction a lot.”
- “Is there another wave coming? I think this wave goes for quite a while. I think this adoption curve we are on, which is a clinically-focused cycle, will continue for a while.”
- “What’s next from Cerner’s point of view? We think the business cycles (revenue and supply chain) that come from the core clinical process need to be re-engineered.”
- “The community physician, I sense now, wants to be connected and in the same high fidelity medium that acute care has... That is our market to go take, and we will go take that market.”

Mike Sommers, CIO of the Cook County (Chicago) Bureau of Health Sciences, explained how he became a satisfied Cerner customer: “We sent out an RFP in 2001 to seven vendors – 3M, MediTech, Eclipsys, Epic, IDX, Cerner, and McKesson. 3M and MediTech dropped out immediately because they either didn’t have the applications or our size scared them. Epic offered no bid because it didn’t want to get into a project of our size and complexity. We did demos and weighted the RFP answers, which took us to IDX and Cerner. The feeling

was that when we looked at IDX, the product was same as when we had selected Siemens three years before...So, the sense was that the IDX product was not moving forward. And we liked the Cerner system. It was a purely clinician vote – and the vote was 33 to 5 for Cerner on the first vote.”

ECLIPSYS

The CEO of Eclipsys claimed his company is “the vendor with the most physicians using our core clinical solutions.” He said, “Our objective is solutions to the industry to create value...We do not believe this is just best applications, though that is a critical component...We believe content and best practice workflows are essential...We intend to provide the industry with best applications on a go-forward technology...What we really want to accomplish is to make a difference in terms of having an impact on outcomes...Outcomes is not simply technology; technology is an enabler to good outcomes...The industry doesn't necessarily need to be just paperless – that can be a positive or a negative – but we really need to impact outcomes.”

Users generally are satisfied with their choice of Eclipsys' new system, SunriseXA – even though there have been issues with it. A Florida user said, “The delay was due to a switch from a web to a client server. Eclipsys stopped its roll-out to take the time and figure out the problem. We should have it in June.” An Arkansas user said, “I'm fairly pleased. Eclipsys' customer service is one of the best. They respond to my requests for changes, but response time is mixed. They have issues that are not resolved yet. They are working through that now. There is a change in the technical direction on the Sunrise platform, and I'm waiting to see if that solves the problems. We are anxious for them to fix the issues because we want a smart client system, and right now it isn't.” However, this customer said he would still choose Eclipsys again: “We bought Sunrise because it is a good product for the clinical needs of our hospital, and I still think it is a strong company.” A Connecticut CIO said Eclipsys has been targeting CEOs, not CIOs. My fear is that in 10 years, only the big companies will be left.”

EPIC

Epic is making a push into the acute clinical market, and a source described it as already being the “800 pound gorilla.” Epic last year signed a big contract with Kaiser, and sources said that appears to be progressing well. An Epic official said the company currently has about 100 large hospital (400+ bed) clients, and he identified Cerner, Eclipsys, IDX and Siemens more than McKesson as the company's key competitors.

CIOs said they like Epic and its products, but they described them as “pricey.” A user said, “I had a concern with the new Kaiser contract because I was afraid it would take too much of Epic's resources, but it seems to be a good partnership, and it is providing more resources instead of less.” A South Dakota CIO said, “Epic has a nice clinical, but it is not integrated with

financial.” A Siemens user whose parent hospital chain has just chosen Cerner said, “If I had a choice, I would have chosen Epic because I think it has the most user-friendly web applications, it is young and aggressive, and other users are happy with its on-time performance.”

GENERAL ELECTRIC

GE was giving its Centricity system a strong push. The first site was due to go live in March 2004. Centricity offers CPOE, pharmacy, laboratory, and PACS with “seamless integration.” A consultant said, “Companies like GE have an understanding of how information technology can be leveraged with other things going on in healthcare – e.g., diagnostics.” A GE official cited a case where Centricity was integrated in a bi-directional manner with a Misisys lab and pharmacy system.

IDX

In an unusual move, IDX restricted access to its booth, putting up a wall around the booth and screening entrants. Competitors and media were not allowed free access to the booth. Reporters were told they could enter only with a prior appointment and only when accompanied by an IDX spokesperson. None of the other vendors restricted the access of either reporters or competitors. In fact, most of the other vendors were very open and willing to show and discuss their products.

IDX users generally had positive comments about the company. A user said, “I like the IDX products, but the company can't clarify the longer term vision for CareCast and FlowCast.” A Florida user said, “GroupCast offers end-to-end integration, which none of the other vendors had...Cerner has vertical laboratory but requires an interface to the database, and IDX doesn't...The tandem hardware platform for CareCast isn't a problem; it's the same as a Citibank credit card transaction.” A South Carolina source said, “We've been a customer eight years, and the innovation is very good. If we had it to do again, we'd still choose IDX.” A German doctor said, “IDX's CPOE is not as fine-tuned for critical care as other systems, but it is as workable as the others.” A Quadramed customer who is about to install IDX's PACS said, “If Quadramed had a PACS, we would have used that, but IDX has a single database, so it is integrated well.” Another CIO said, “Service is getting better, but IDX has had a lot of downs.” A Tennessee user said, “It took us longer than expected to get our web front-end working, but now that we are there I, and our users, like it.”

Other comments about IDX include:

- “The systems are very functional.”
- “The innovation is very good.”
- “The company's strength is its products.”
- “IDX's strength is with physician groups.”
- “No lab system, so it is not integrated.”

- “IDX is not a leader.”
- “IDX’s weakness is its support.”

CareCast (clinical)

An IDX sales rep estimated that it is in use by about 500 U.S. hospitals. He said it uses a Sequel database, and the next generation will use the same platform. A user said, “The tandem hardware platform for CareCast isn’t a problem; it’s the same as a Citibank credit card transaction.” However, another user had a different opinion, “FlowCast and CareCast use different hardware, and they don’t talk to each other very well.” Another source said, “IDX’s target audience is academics, and that market is sewn up. The company needs to penetrate big doctors groups...The key competitors are Siemens’ Signature and McKesson’s Horizon.”

FlowCast (finance/administration for large physician groups)

The market for FlowCast is still growing, sources agreed. A user said, “The market is not saturated, but it is close to saturated.” Another customer said, “We are installing FlowCast, with a go-live date of July 1, 2004. We chose it because it has very good integration.”

With respect to competitors, an Ohio CIO said, “Epic and Misys are the major competitors. Siemens used to have market share with Signature, but I’m not sure how active it is now. Cerner is trying but it isn’t great yet. Mom and Pop doctors offices are not IDX customers.” Another CIO said, “Epic, MedicaLogic, and Eclipsys are the main competitors. Cerner isn’t a competitor because our hospital has that, and the Cerner products are very hospital-specific.”

GroupCast (finance/administration for small physician groups)

A user said, “I can’t say what the advantages are because I inherited it. We’ve had to build a lot of sandbags around it for functionality it doesn’t have.” An Indiana user said, “We are still in a settle-in period. IDX was not my choice, but we are making it work...Implementation was flawed from a customer, IT, and vendor standpoint.” Another CIO said, “It’s a highly competitive market, but GroupCast is inexpensive.” A third CIO cited NextGen and Cerner as key competitors for GroupCast.

Given the growth in ambulatory surgery centers and specialty hospitals, sources believe there is room for IDX to increase sales of GroupCast. A user said, “There is plenty of room for growth. It is a huge market.” Another user said, “The market is mostly saturated. There is still a need for EMRs, but IDX doesn’t have EMR. It depends on its partner, AllScripts for that, and AllScripts is middle-of-the-road.”

ImageCast (PACS)

A user said, “We have ImageCast for radiology, but for billing and scheduling, not imaging. For imaging, we use Philips.”

U.K. Contracts

Sources generally agreed the two large U.K. contracts that IDX recently landed will help the company’s image, but they doubt the contracts will help IDX land more U.S. business. An Ohio CIO said, “The U.K. deals will have no effect on U.S. demand, but it affects IDX because it gives them exposure to a different way of thinking that I hope brings opportunity to the U.S.” A Kentucky CIO said, “Those deals won’t help, and they could be a negative if the company is too busy with them.” Another CIO said, “I’m not sure if it will help sales, but it will give it more presence.” A New Jersey CIO said, “The contracts made me feel better about the company, but it was not a real factor in our choice of IDX for PACS.” Another CIO said, “I think the deals will help U.S. business, but it wouldn’t influence me. Functionality and customer support are what count.” A Canadian CIO said, “The contracts could help IDX enter the Australian market where Cerner now dominates.”

Deal with AllScripts

Customers generally are satisfied with AllScripts, and AllScripts has a good reputation. There may have been some bumps on the relationship at first, but those appear to have been ironed out. A CIO said, “I’ve been disappointed in the deal because of strategy changes which have confused us, but I think they’ve come out of that now.” Another CIO said, “We looked at two or three EMR vendors and chose AllScripts because of its good integration. It was one of the smoothest integrations I’ve ever done.”

KODAK

Kodak may be poised for a big push in healthcare. A consultant said, “We will see Kodak come back in, and I think they will come back in a big way...The biggest threat from Kodak is to Philips, which has a weaker PACS product.”

MCKESSON

Pamela Pure, COO and soon-to-be-president of McKesson, outlined several trends facing the industry and her company:

1. **Digitization.** “Our theme at the show this year is digitizing, which means eliminating paper and film, decreasing phone calls and manual hand-offs, streamlining management of complex care, providing anytime/anywhere access to information, etc.” Two McKesson products shown at HIMSS were a brand new HP digital assistant – a more functional, more robust PDA – and a digital assistant for nurses.
2. **Relationships.** I’ve witnessed a fairly significant transition...where customers, until recently, bought products...and we were in a feature/function war of who had the most bells and whistles. That has changed today. It is no longer about the product...It is more about relationships.”

- 3. Home Care.** “We’ve been spending a lot of time in home care...We have a large home care IT business...Right now we are spending a lot of time looking at telehealth – things like scales that can report your weight...It is an early area for us, but by year end you should hear more about us in home care.”
- 4. Safety and Clinical Efficacy.** “The dramatic growth (in the market over the next five years) will be on patient safety issues, especially medication safety and around clinical efficacy and clinical effectiveness – PACS, document imaging, etc. – where there is demonstrated, proven ROI. As those get satisfied, we also will be seeing growth in process re-engineering (consulting services). Trailing that by 18-24 months will be a renewed focus on higher productivity and better integrated financial systems.”

McKesson Product Outlook

Solution	FY03	FY04
Horizon patient portal	300,000 logins/month	725,000 logins/month
Horizon patient folder	1.2 billion documents	2 billion documents (33% growth in live sites)
Horizon claims administrator	150 installed sites with 1.38 million claims/month	271 installed sites with 2.47 million claims/month

Asked what technology McKesson has or has in development for home infusions, an official said, “Device manufacturers are working on this technology...We are working with several hardware vendors to create a home monitoring capability around four or five key biometrics that are strong indicators of whether an acute care or home care visit is required...We are focusing on home monitoring rather than interventions or medications.”

Four years ago a “significant share” of McKesson IT sales were in the fourth quarter, and that appears to still be true. An official said, “This year it will be close to 40%, and most of the sales seem to happen in the last month.”

Most of McKesson sales are to existing customers. An official said, “We had a rocky road in 1999 when we purchased HBOC and some things didn’t go exactly right in terms of reporting...At that time, we had a number of products that didn’t work, and we had dissatisfied customers...We eliminated our new business sales team and focused exclusively on existing systems...Then, two years ago, we started another new business team...We recently closed the first handful of competitive new market deals...We will see a couple more in the fourth quarter...Right now, 85% of new sales are from existing customers.”

McKesson has new products on the drawing board, but no plans to sunset existing products. An official said, “We have no current sunsetting plans...We have a number of next-

generation applications that are ready to go and are rated very highly, like our materials management product...I think there will be enough incremental function for our (legacy customers) to move aggressively to the new products...There are no plans for sunsets, but we will be aggressively marketing the new products to encourage customers to go to the next version of products.”

The company is not ruling out acquisitions, but officials are proceeding very carefully in that area. One said, “We continue to look at opportunities...We are always looking for the right acquisition...but the strategy has changed significantly vs. the late 1990s where it was acquire companies to grow...Now, we are focused on why we would make an acquisition – what is the strategic architectural fit, and how does it fit into our strategic portfolio?...So, there is more focus on strategic acquisitions.”

McKesson plans to integrate its clinical documentation with LMS’s fetal monitor and surveillance system. Right now, this is a business partnership agreement. A McKesson official explained, “LMS is our preferred solution. If a customer is interested in a fetal monitor, we will introduce them to LMS, but we are not selling or distributing the LMS monitor. We are working behind the scenes to put together our documentation and their equipment as one product. Once we have a new GUI, we will brand it, and sell it. That will be our branded OB solution...LMS can still sell their system as a stand-alone product...LMS could go to Cerner, or someone else, and do the same deal, but I don’t think they will...LMS has a big differentiator – C-section predictability. None of the other (fetal monitors) have this capability.”

Other comments about McKesson included:

- General: An Alabama CIO said he was going to evaluate Siemens and Cerner, but when his doctors saw the McKesson system in operation at another hospital, that’s what they wanted, so he didn’t look at the others.” Interestingly, he said McKesson is using the Linux operating system for its portals. An Indiana user said, “Eclipsys and McKesson were on our short list, and we chose McKesson because its total solution was cheaper since we were already a McKesson customer.”
- Pricing: A Wisconsin user said, “McKesson is always a little pricey.”
- Service: A user said, “Service has been up and down, but it is adequate now.” An Indiana user said, “Service is pretty good, and implementation has gone very well.” A California user said, “Service is better than it used to be.” Another West Coast user said, “Service is good.” A Wisconsin user said, “The quality of support is excellent.” An Arkansas user said, “Service by all of the big companies is about the same. They each have their ups and down.” An Indiana user said, “Service is fine.”
- Implementation: A Wisconsin user said, “Implementation has been excellent.” An Arkansas user said, “Their

implementation is one of the worst. They simply don't implement very well." Another user said, "McKesson integrated our core system, but that didn't do the job. They promised integration, but they didn't deliver." A California user said, "We just did a physician portal, and the implementation went well." Another CIO said, "Implementation has gone very well, mostly because we have a firm grasp of project management at the hospital level."

- Integration: A user said, "Integration is only fair, and it is their fault because they are not very open all the time." A Paragon user said, "Paragon is well-integrated, but there isn't enough functionality. We are always waiting for the next product." A Wisconsin user said, "Integration is reasonably good, but it requires an interface for true integration." An Arkansas user said, "Most vendors can interface; it's not rocket science, but I haven't seen any true integration without interfaces." A Pennsylvania user said, "McKesson's Paragon is well-integrated, but it doesn't have enough functionality... We're always waiting for the next product." A California user said, "Integration is pretty good. We interfaced to Epic for clinics, and that worked well." A McKesson official said, "Pharmacy is the most difficult to interface. Other applications interface well with other vendors." An Indiana CIO said, "Our integration has been successful so far."

MEDITECH. A New England CIO said MediTech does for smaller hospitals what Siemens and Cerner can do for larger hospitals, just for less money. He said MediTech has all the systems, just not all the bells and whistles, and integration is good.

MISYS

A source (NIH) said, "Misys is one of the best integrated systems."

ORACLE

A consultant said, "I'm not sure where Oracle is. It keeps jumping in and out of HCIT."

PHILIPS

The U.S. is a fairly fragmented marketplace, according to a senior Philips official. He said, "I'm excited about the next 10 years... We have been through significant change, and I assure you that if you aren't prepared for change over the next 10 years, you shouldn't be in this business."

Over the last few years, Philips acquired Agilent, ADAP, and Marconi, emerging as a stronger player in the HCIT space. An official said, "We have taken a different tack from GE and Siemens. GE has a full line and has made significant

acquisitions. Siemens has done some acquisitions, including SMS, and divested others. Philips focuses on three things:

1. Making a clinical contribution – making sure we provide high quality, low cost solutions.
2. Having strong partners – for example, the partnership with EPIC.
3. Quality, low cost solutions – such as real-time 3D ultrasound, an integrated voice recognition system for radiology, home AEDs, etc."

SIEMENS MEDICAL SOLUTIONS

If there was a hot enterprise product at this meeting, it probably was Siemens' Soarian. Siemens claims Soarian has three innovative characteristics:

1. Workflow-engineering that synchronizes processes across the health enterprise.
2. A smart user interface that anticipates the needs and unique processes of individual users.
3. Embedded analytics that let users monitor, measure, and act.

Several CIOs said they recently ordered Soarian, and all were enthusiastic about it. A West Virginia CIO said, "One reason we bought Soarian is that the database will be used by all the Siemens modules, so with Soarian we won't have integration issues." An Ohio CIO said, "We are implementing Soarian, but we are not live yet. As early adopters, we can tweak it." A Tennessee CIO said, "We are a best of breed shop of nine hospitals. We use Siemens' patient accounting and Cerner for the lab. We needed a clinical repository, and we signed with Siemens for Soarian, which is coming out in modules. This is a 15-20 year commitment with a vendor, and Soarian has good integration."

No users questioned have seen or experienced any Soarian delays, and all insisted that deliveries are on schedule. A West Virginia CIO said, "We will be installing Soarian. There are components available now, and our program trails their roll-out. We believe our plans will track with product availability." A Tennessee CIO said, "I haven't seen any delay, and the company hasn't missed any date on deliverability."

THE FUTURE

What will healthcare look like in the next 10-20 years? An Eclipsys official said, "From an improvement standpoint in the industry, I think we are hitting the wall, and I think technology will have a huge effect... The technology is there today... So, in my mind, I believe we will move to a paperless environment. If you look at health models around the globe, healthcare has to change and technology needs to come into healthcare to take it to the next level, to improve workflow, outcomes, and financials." A Philips official said, "Advance-

ments in imaging technology will provide more and earlier insight on a person's health status...and that will drive significant computational demand...If you move CT to 42 slices, that is a gigabyte of data per exam, and that's a significant demand on storage...That will happen over the next five years for sure...Then, genomics, molecular diagnostics, and imaging will revolutionize how medicine is practiced."

A speaker pointed to these technologies as having the most potential to change the HCIT landscape:

- **iBot's Roomb**, a \$200 floor-cleaning robot vacuum.
- **Health Hero Network's** telemedicine solutions for uninsured diabetics.
- **CHF Solutions'** filtration device that drains excess fluid from heart failure (CHF) patients who are resistant to diuretics.
- **Alere's** DayLink monitor, an interactive patient scale for diabetics and CHF patients.
- **Visicu's** eICU products for remote ICU monitoring.

However, there are several "wildcards" that could affect the outlook for HCIT, including:

- **National and international economies.** A speaker said, "Personally, I am not bothered by budgets...Medicare and Medicaid will get worse before they get better...For the first time in 20 years, I am truly concerned about us facing a downturn in the national or international economies...This is a presidential election year, and we are hearing how rosy the future is...but it is downright scary...There is nothing we can do about this, but we are more vulnerable to the international economy than to Medicare spending."
- **Capital markets.** A speaker said, "Of 5,000 hospitals in the country, only 1,700 have viable access to capital."
- **Infectious diseases.** A speaker said, "One of the biggest single reasons for IT in healthcare is its role in identifying diseases in the emergency department...IT is an essential tool for predicting when and where they occur."
- **Terrorism/natural disasters.**
- **Changing climate** – roadblocks and challenges, such as practitioner acceptance, proliferation of sites of care, etc. A speaker said, "One of my strongest pleas...is that we have to abandon ROI (return on investment) as a way of judging healthcare technology. You should think less about ROI and more about SIB (staying in business). IT is a cost of doing business safely and appropriately."
- **Accreditation.**
- **Prior disappointments with flawed products**, botched installations, uneducated users, etc.
- **HIPAA privacy issues.**
- **Healthcare politics.**

- **A CMS pay-for-performance pilot** in conjunction with Premier in five clinical conditions at 300 hospitals, measuring 34 quality indicators. CMS will pay a higher reimbursement rate to hospitals in the top quartile on those indicators. A Cerner official said, "This could be a fundamental driver of investment in IT...Very few of our competitors are able to do this (documentation), but we are able to do it today." Another Cerner official said, "If CMS's pilot pay-for-quality program goes forward, it will go to probably 75 conditions, and the number of indicators would balloon...You would have to be automated in that world...I was in an office with a pilot participant who bought a competitor system two years ago, and he was bemoaning the cost of abstracting the data."

Currently, about 75% of employers offer tiered prescription benefits. A pharmaceutical industry expert predicted tiered physician and hospital payments are coming. He noted, "CalPERS has disqualified about 12 hospitals as 'too expensive'...Nowhere was there a discussion of the quality of the care they provide...If you work in an academic hospital, this should concern you...And these co-pays are not \$5-\$10, they are \$30-\$50."

Possible scenarios:

- Hospitals in a pay-for-performance mode by 2005.
- Doctors paid bonuses for taking better care of patients with certain disorders, such as cardiovascular disease or diabetes.
- Rewarding doctors for investing in technology to improve care, such as per-patient bonuses for investing in systems such as EMRs.
- A shift from input-driven models where payment is based on outcomes and results, not office visits and bed days. In this scenario, outcomes assessment tools become critical to obtain differential payment.
- An eventual move to Continuity of Care Records (CCRs) that includes patient, insurance, health status, care, and care planning information. Patients would own these health records, but they would reside with providers and would move from provider to provider when the patient moves. An expert said, "This implies a universal patient identifier, and there is an advocacy initiative to put forward the idea of a voluntary patient identifier... Without that, none of this works." Social security numbers are not sufficient for this because they have problems with identify theft, duplications, uncovered patients (e.g., undocumented aliens, newborns, etc.). Another expert said, "I personally believe the electronic health record (EHR) is going to pass...because this is on the federal government's radar screen...And they are the gorilla...They don't want to mandate this, but if they have to, they will...We are facing a Medicare deficit, and it will be catastrophic if we don't get an HIT platform in place...The federal government is perhaps the only body with sufficient clout to impose standards unilaterally."

MISCELLANEOUS

Medical instrumentation. A consultant said he's working with a New England hospital that is looking to tie medical instrumentation into its advanced clinical system, using either GE or Siemens.

HIPAA. Another consultant predicted there will be widespread HIPAA non-compliance when the final rules go into effect in October 2004.

Medicare-approved Prescription Drug Discount Cards. Former House speaker Newt Gingrich is optimistic that the Medicare discount cards will be successful, and he doesn't think that 60 or more different card offerings will be too confusing for seniors. He said, "Wal-Mart has 258,000 items in a superstore, and no one has suggested seniors should only be allowed to go to aisles one or two...It is a maniacal idea that 60 choices is too many for seniors...AARP, the federal government, all the commercial entities, and the news media will have a substantial publicity effort in May and June (2004)...I suspect AARP will print a fold-out in its magazine outlining all the choices, and there will be a web page at the federal government level."

Gingrich also thinks that seniors will be happy with the savings they get from the cards, giving the administration a boost for the November elections. He said, "I'd be surprised if by September (2004) we don't have patients getting 15%-25% off drugs and a fairly significant number who are getting \$600 paid for by the government."

GREENWAY MEDICAL TECHNOLOGIES

One private company worth watching may be Greenway, a medical software provider with a web-based practice management solution that integrates clinical and financial information. Greenway was the first bank check imaging company, but it sold that part of its business in 1998 to a financial services firm. COO and president Tee Green said, "We kept healthcare. No one knew that division because it was in R&D, but now we have 136 contracts with 89 live sites, predominantly in the Southeast but in 24 states...We learned how to develop mission-critical applications for small business America."

The Greenway PrimeSuite system, which is targeted at mid-size medical practices, competes primarily with Misys and WebMD's Medical Manager. It is premium priced, but it offers both EMR tracking and secure patient recording. COO Green cited some of the key advantages of the Greenway system:

1. No interface is needed to access the patient's medical record. He said, "Our ambulatory solution is not practice management and not EMR system. It is both of those together built from the ground up."

2. Exporting from the system is easy. He said, "All the major hospital systems can accept our data...so information exchange is not a problem."
3. The usability of the EMR portion is good.
4. Every client gets a pre-sale return on investment analysis plus one-year after the sale, there is a post-ROI analysis to see if the expected savings were accomplished – and if not, why not. Both analyses are done by outside consultants.

Green said EMRs have been "horribly unsecure" for two reasons:

1. In physicians offices the EMR was interfaced to practice management software, and that made the system too complicated for doctors to manage.
2. The physician systems were financed by pharmas which wanted the data...so the application design was not based on physician workflow or ROI, but on data capture...This slowed doctors down.

