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Electronic Health Records for Non-Owned Doctors

In my previous post The top 10 things that will keep me up at night in 2008, the number one project is providing electronic health records (EHR) to non-owned physicians.

This will be the first of a series of posts about this very complex project. My posts will detail the cost challenges, the partnership we’ve built to execute the project, and the technical approach we’ve taken. Since this is truly a work in process, I’ll publish these posts each week over the next few months.

Since 2002, my IT teams have provided electronic health records to every owned/closely affiliated clinician of Beth Israel Deaconess, using our home built webOMR software. We even have a Medical Executive Committee policy mandating the use of electronic health records for owned clinicians by July 30, 2008. 'Use' is carefully defined, since we want all our clinicians to update the problem list, create an electronic note for each encounter, and perform all medication management (e-Prescribing, medication reconciliation, allergy documentation) electronically. Of interest, recent data collected by David Blumenthal of Massachusetts General Hospital concludes that only 4% of clinicians in the US have this level of use of fully functional electronic health records.

Since Stark safe harbors now enable hospitals to fund up to 85% of the non-hardware implementation costs of private practice electronic health records, my teams are now expected to provide EHR solutions for all the non-owned affiliated BIDMC affiliated physicians in Eastern Massachusetts. This is a very different project than providing applications and infrastructure to owned clinicians, which we manage, on a network, which we manage.

The planning for the project includes the following major issues:

1. Designing Governance – My typical steering committees are drawn from hospital
senior management, employed clinicians and hospital staff. The governance of a community-wide electronic health record system must include members of the physicians’ organization, private physicians, community hospital executives, and legal experts.

2. Modeling costs – The 'hydraulics' of the project budget are quite complex. The hospital wants to support implementation for as many physicians as possible but has limited capital. The physicians want as much implementation subsidy as possible since by Stark regulation they have to fund all hardware and ongoing support themselves. The number of doctors implemented, the level of subsidy and total costs for all stakeholders are interrelated but each party has different goals.

3. Planning for distributed users – These non-owned clinicians are widely dispersed throughout Massachusetts and New England in urban and rural settings. Bandwidth varies from 20 Megabit Verizon FiOS connections to 56K dialup. Technology sophistication varies from fully 'wired' clinicians to offices run on 3x5 index cards.

4. Managing the project – CIOs traditionally serve hospital-based customers. They may not have the bandwidth or expertise to serve non-owned geographically dispersed customers.

5. Building a scalable infrastructure - The architecture must be designed to minimize costs, maximize reliability and support a project scope that is continually evolving.

6. Deploying staff - The existing hospital IT staff is not optimized for supporting networks, telecom, desktop and application at hundreds of remote locations. The physicians' organization and clinician offices do not have the staff or expertise to execute this project.

7. Creating the Model Office – A clinically integrated network of providers in a community will want to adopt a standard EHR configuration with common dictionaries to support healthcare information exchange and continuity of care. Standardizing software configuration means standardizing workflow, which requires business process re-engineering. Practice consulting is needed to balance standardization with specialty specific processes, ensuring that providers buy into the new workflow and staff are appropriately trained.

8. Obtaining all the funding - Once the scope, architecture, staffing and cost modeling is completed, the funding must be obtained from all of the stakeholders. State and Federal governments are not likely to contributing anything. Payers may fund the outcomes of EHR use via pay for performance, but are unlikely to pay for implementation.

9. Specifying the order of implementation - How do we choose the most appropriate offices for pilots and once those pilots are completed, how do we place hundreds of clinicians in a well ordered queue for rollout?

10. Supporting the practices – Hospital support models depend upon standardized
networks and desktops with end to end control over the quality of service. Supporting heterogeneous practices requires on site, high touch, higher cost service.

My goal is to create a blog entry for each of these issues. Next week, I'll publish the governance model. The following week, I'll post the detailed considerations we're using to develop the cost model (the finished models will be published under 'obtaining all the funding', since they are still evolving). By the time all 10 posts are done, we'll be live in pilots with 4 practices and I hope to be able to sleep again.
MONDAY, FEBRUARY 4, 2008

Electronic Health Records for Non-Owned Doctors - Governance

As promised last week, I will blog each week about the 10 critical aspects of our project to provide a hosted electronic health record solution for non-owned clinicians, one of the most challenging projects facing hospitals nationwide. This week's entry describes our project governance.

The needs of many stakeholders must be balanced to ensure the success of this project. The hospital wants to support as many clinicians as possible using its capital budgets most efficiently. Community clinicians want to minimize the financial and operational impact of the project on their practice. IT staff must manage their hospital-based projects and infrastructure while expanding their scope to new offsite locations.

Governance is critical to establish priorities, align stakeholders, and set expectations. To support this project we created two governance committees - a steering committee and an advisory committee.

The steering committee is comprised of senior executives from the hospital and physicians' organization, since it is truly a joint effort of Beth Israel Deaconess Medical Center (BIDMC) and the Beth Israel Deaconess Physicians' Organization (BIDPO). BIDMC representatives include the CFO, the CIO, the SVP of Network Development and the IT project manager. Physicians' organization members include the President, the Executive Director, and the Chief Medical Officer of BIDPO. This committee provides oversight of legal agreements, financial expenditures, project scope, timelines, and resources. It is co-chired by the CIO and Executive Director of BIDPO, who jointly sign off on all expenditures. The BIDMC and BIDPO boards provide additional oversight of the committee chairs.

The advisory committee is comprised of prospective community physician users of the electronic health record system. Since our community network is comprised of 300 non-
owned Boston-based physicians, clinicians in the western suburbs and clinicians in the southern part of the state, we have representatives of each group sitting on the committee. The committee focuses on making the project really work for the practices, but also to meet the needs of the physician organization's clinically integrated network model. The role of the committee is to review our "model" office templates, help us prioritize the implementation order of practices, and make recommendations on policies. As with every project, we use our standard project management tools including a charter for each committee.

Since this project is so challenging and requires a precise blend of economics, information technology and politics, the governance committees are the place to ask permission, beg forgiveness, and communicate progress on every milestone. This is especially true to the complex cost model which shares expenditures equally between the hospital and physician's organization for implementation, subsidizing private clinician costs to the extent we are able based on Stark safe harbors. As you'll see in next week's EHR blog entry, the costs are diverse and deciding who pays/how much they pay cannot be done alone by IT, the hospital, or the physicians. It's truly a role for transparent, multi-disciplinary governance committees.

POSTED BY JOHN HALAMKA AT 2:30 PM

ABOUT ME

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VIEW MY COMPLETE PROFILE
Electronic Health Records for Non-owned doctors - Cost modeling

The third entry in my series on the 10 critical aspects of providing electronic health records to non-owned doctors is about modeling the costs of the project.

Based on the informatics literature, the initial implementation cost of an EHR for private practices averages between $40,000-$60,000 per provider and the cost of maintenance averages $5,000-10,000 per provider per year. Using these numbers, the total EHR implementation costs for our 300 non-owned doctors could be $12-$18 million and $1.5-$3 million per year. Of course, this includes total costs paid by the hospital and by the practices. To understand the economics of the project, we need to inventory all the costs included and who pays those costs. Stark safe harbors provide some guidance here, since Stark separates costs into those which can be shared with hospitals and those which must be paid by the providers themselves. Up to 85% of implementation costs excluding office hardware can be funded by the hospital. Hardware and most ongoing costs must be paid by the providers. We must also consider what costs the hospital should absorb for planning, legal and infrastructure to offer EHR services to non-owned doctors. These startup costs are nearly the same for 30 or 300 doctors, so they are not easily computed on a per provider basis.

Initial Costs
1. Startup costs to be funded by the hospital
   Planning
   Legal costs
   Hosting Site hardware and operating system software

2. Practice implementation costs to be shared between the hospital and practices
   Software licensing fees
   Technical Deployment services and Workflow design services
   Project Management costs
Training costs
Interface costs
Data conversion costs

3. Practice implementation costs to be funded entirely by the practice
Hardware local to the practice

**Ongoing costs**
1. Maintenance costs to be funded by the hospital
Hosting Site staffing and hardware lifecycle maintenance

2. Support costs to be shared per Stark
Help desk
Practice consulting support

3. Support costs to be funded entirely by the practice
Hardware service and support
Network connectivity

Of course, each of these categories and subcategories has its own detailed analysis. The "hydraulics" of our model must take into account the goals of the stakeholders - the hospital has a fixed capital budget and wants to connect as many doctors as possible. Doctors want as much subsidy as possible. Given the hospital contribution of $x$ million, and a doctor's ability to pay of $y$ thousand, we need to compute the subsidy level and number of doctors included in the rollout. To help with this decision we're dividing our budgets for all the categories above into fixed startup costs and marginal costs to add 100 doctors. We're also categorizing all costs as subsidizable or non-subsidizable.

Over the next 90 days, we'll do our best to achieve economies of scale, negotiate appropriate vendor pricing, and document acceptable service levels. Our Governance committees will review the final pricing to ensure we've achieved a balance of hospital costs, practice costs, and service. We'll also refine our cost models by documenting all the costs we experience in our pilots this Spring.

Our internal staff and external collaborators are doing a remarkable job documenting the costs. We'll know soon if it is possible to use the capital budgets that the hospital has available to create an EHR product at a price that clinicians are willing to pay for.
JOHN HALAMKA

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VIEW MY COMPLETE PROFILE
Electronic Health Records for Non-owned Doctors - Planning for Distributed Users

This is the fourth entry in my series about electronic health records for non-owned doctors. Today's topic is about supporting hundreds of clinicians, spread over a wide geographical area with varying levels of IT infrastructure and technology savvy.

CIOs of academic healthcare facilities are used to highly controlled and predictable environments. We oversee the quality of service from end to end. Desktops have a managed image with updated anti-virus software. The network is physically secured in closets we control, using fiber and cables we install. Our teams and our management is optimized to deliver service that are consistent and standardized.

The Electronic Health Record project for non-owned doctors requires a different approach. The initial 300 doctors in 173 physical locations spread over 450 square miles have diverse needs and heterogenous access to infrastructure. Some already have computers, wired and wireless networks. Most do not. Those in rural areas may have limited access to bandwidth, making business DSL their only choice for connectivity.

The alternatives we considered for serving these geographically distributed users was

- Expand our current IS offsite team which currently focuses on BIDMC owned clinicians and those occupying BIDMC leased space. This matrix illustrates the different kinds of physicians we support and the services we currently provide.

- Negotiate group purchasing agreements with vendors and make these available to clinicians, reducing heterogeneity but not providing installation and management of the infrastructure. Physicians could hire local consultants, family members, or do it themselves.
- Outsource the infrastructure of these practices to a firm specializing in managing the IT needs of independent clinicians

We weighed the benefits and costs of each approach and elected to outsource infrastructure to Concordant.

Here's our thinking

- Geographically distributed practices needing 24x7 support would require a large internal team to provide a high service level, weekend coverage and vacation coverage. Although we are currently planning on 300 clinicians, that number might expand to 500 or 1000, hence scaling up with agility would be challenging, especially in a job market where many hospitals are competing for skilled IT professionals.

- Our current offsite group is extremely good and focused on providing infrastructure and application services to sites we operate. Expanding this group to support a very different kind of practice with very different infrastructure would dilute their current focus.

- Enabling these distributed offices to purchase their own equipment and establish their own local infrastructure could be disastrous. Guaranteeing service levels means that we must have an understanding of the network performance, desktop configuration, and local infrastructure (printers, scanners, fax machines) of each office.

Our plan is to operate a highly reliable hosted electronic health record, housed a commercial co-location facility and make it available to each of these practices via the public internet without having to create network or telecom connections ourselves. At each office location, however, the desktops, wired and wireless network will be completely homogeneous and managed by Concordant. We'll leverage the scale of the project to obtain the best discounts possible from hardware vendors. We'll even retire existing office hardware to achieve homogeneity. Help desk services will be staffed by Concordant, so that we will not need to train our existing help desk staff to support these distributed non-owned clinicians.

We elected not to place servers in any clinician offices since physician offices do not have backup power, environmentally controlled server rooms, or appropriate physical security for machines hosting the data. Our plan is to maintain a central hardware depot, assemble all the equipment needed for an office, deliver it, configure and test it. Everyone wants to minimize on-site support, but some on-site service will still be needed for hardware failures and very "high-touch" support. Remote support and monitoring techniques can help, though minimally, since we're implementing a centralized architecture.

It is our hope that a dedicated outsourced infrastructure service, optimized for the needs of the geographically distributed small physician office will work better and cost less than expanding our existing IS teams or enabling physicians to do it themselves. It also enables us to track costs more closely since there is a strict separation between support
for owned sites and non-owned sites. Our first non-owned sites go live in June and I'll let you know how it goes.

POSTED BY JOHN HALAMKA AT 1:38 PM

5 COMMENTS:

Richard Dale said...

This is a great series - thanks. My question is whether these non-owned practices have relationships with other networks and so have a choice (or worse, a multiplicity) of EMRs? If so, how does it work out? Also, you describe providing some consistency with a single set of hardware and a particular service provider... How does that work if the practice has other systems (for management/billing etc)?

FEBRUARY 19, 2008 10:01 AM

John Halamka said...

There is no choice of EMR - we're implementing eClinicalWorks. This is the only way to achieve clinical integration and quality measures needed for pay for performance. Similarly, we're mandating one practice management system, the one built into eClinicalWorks. Creating numerous interfaces to heterogeneous practice management systems is a recipe for disaster.

FEBRUARY 19, 2008 3:19 PM

Richard Dale said...

I think this answers my question - these non-owned offices do not have relationships with other hospitals (Childrens or Partners) or utilize services (and SaaS s/w) from folks like AthenaHealth?

Will adoption of your PPM/EMR be a requirement in future for practices who wish to maintain their relationship with BIDMC, say if they currently use AthenaHealth for their PPM? Alternatively could you imagine a practice with their own EMR inter-operating through a RHIO infrastructure?
(Excuse these questions - I am not so familiar with the relationships between non-owned practices and the hospital.)

FEBRUARY 19, 2008 3:46 PM

swaters said...

Semper Vivo, www.sempervivo.com, is able to provide choices for EMR and PMM. The service is designed to integrate across different systems and eliminates the need for small medical practices to buy server hardware and software while eliminating the lions share of consulting costs. Local hospitals are not equipped to provide these services and this is clearly an area where RHIO's and HIE's are unable to develop sustainable business models. The fact is it is very difficult to determine exactly which way medical records are likely to go particularly when you throw in Personal Health Records as proposed by Microsoft and Google. Therefore an adaptive solution is a very good choice for any provider looking at implementing medical software and technology into their practice.

FEBRUARY 21, 2008 9:30 AM

stephanie said...

Its so awesome that you have this blog. I'm an IS major hoping to go into Heath IT, this blog kinda helps me see what's going on in the field a little bit; even though half the time im confused, but it's all good, im learning slowly.. keep posting :)

FEBRUARY 26, 2008 6:26 AM

ABOUT ME

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View my complete profile
Electronic Health Records for Non-owned doctors - Managing the project

As I've indicated in my blog about managing IT projects and managing consulting engagements projects do not manage themselves. Although we've put together a remarkable partnership of vendors and service providers for our Electronic Health Record for non-owned doctors project, it's all wrapped in $1 million dollars of project management, coordination and "air traffic control". The geographically dispersed set of independent physician practices makes the project that much harder to manage. Our partners for this project are

eClinicalWorks - a leading provider of practice management and CCHIT certified electronic health records, accessible over the internet using a smart web client, from anywhere in the world. They will provide the software, training, and review of all our infrastructure designs.

Concordant - a leading provider of desktop, network, and server hosting services for clinician offices throughout our region. They will provide the hosting center for our Software as a Service (SaaS) EHR applications, operate our help desk, and deploy all our hardware to clinician offices.

Massachusetts eHealth Collaborative - our regional implementer of electronic health records with expertise in practice transformation. They will provide the practice consulting expertise to move clinicians from paper-based workflows to electronic systems.

Third Brigade - a leading provider of security, ethical hacking and host-based intrusion protection services. They will ensure we protect the privacy of patient records, since confidentiality is foundational to the entire project.

My internal staff, consisting of a Project Director, Project Manager, Project Coordinator,
and design engineer will coordinate all the work done by our partners, design the model office/ideal configurations for the entire rollout, and manage the budget. Our first 4 pilot sites will go live this Summer and by Fall we will have gained enough experience that we'll refine our project plans and management oversight to be the equivalent of a "Starbucks franchising model." We expect that this model will enable us to choose a practice and then 6 weeks later have them fully up and running with hardware, software supplied from our central hosting facility, training, data conversions and interfaces. Being able to rollout practices in this timeframe, leveraging economies of scale, and using our partners most efficiently will result (we hope) in low cost and high customer satisfaction, since we'll do all the work with a minimum amount of wasted effort.

My experience with a project of this complexity is that a few additional months spent planning, project managing, and piloting will improve the quality of the project immensely and ultimately reduce our costs. The expense of doing the project twice to get it right far exceeds an investment in project management to get it right the first time. As we develop our "Starbucks franchise" Gantt charts, I'll post them, so all can see the critical path items that are being managed for each practice site.

POSTED BY JOHN HALAMKA AT 5:40 PM

ABOUT ME

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John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.

VIEW MY COMPLETE PROFILE
Electronic Health Records for non-owned doctors - scalable infrastructure

This is my fifth entry about our Electronic Health Record project for non-owned doctors. As I've described, the scope of the project is to implement a highly reliable, secure, feature rich, well supported, but affordable electronic health record for private practices. Today's entry is about building the scalable centralized Software as a Service hosting infrastructure to meet these goals.

A key design requirement for the project is scalability. Our projected customer base is 300 clinicians and we have a fixed start up budget. However, we must design the infrastructure in a way that can cost effectively support the smallest amount of adopters as well as scale to thousands if our project is wildly successful. We debated two possibilities (metaphorically speaking):

a. Build a hotel, not knowing if anyone will ever check-in
b. Build a housing development, where the limits of expansion are only defined by available land

We decided on choice "b", starting with a robust foundation and adding new equipment and storage as we add clinicians. We standardized our central site equipment on products from HP EMC and Cisco, with guidance from our infrastructure partner, Concordant, and our equipment supplier CDW, ensuring it was easy to plug in additional hardware on demand. We invested a significant amount of time designing the central hosting facility, doing it right the first time. Over the years, I've seen CIOs rush through the design phase, only having to rebuild the infrastructure later when application performance did not scale. We partnered with our vendors to build something special, that if successful, could be a model for other medical centers and communities.
Considerations in designing our hosting infrastructure included:
* Supporting a user base that is remote, unmanaged, and diverse. We need to be able to identify any performance issues via end to end monitoring of all components
* Meet important security and privacy restrictions, as well as address liability issues (who is responsible for what)
* Understand infrastructure costs for a) start up b) additional capacity that occurs in bursts or steps, and c) variable requirements as practices go live.
* Provide connectivity to external parties (labs, claims, etc...) through interfaces which create additional security and performance complexities
* Address the limitations and performance of "last mile" connectivity through publicly available internet access (DSL, cable, etc.)

The infrastructure choices we made are:

Virtualized servers - VMware was the natural choice because of the scalability design goals. VM and V-Motion technologies also play an important part in redundancy, failure recovery and disaster recovery

Physical services - We debated rack mounted verses blade servers and elected to use powerful small footprint HP rack servers connected to fast multi-tiered storage. We computed the economics of blade servers verses rack mounted servers and the use of VMWare made small powerful rack servers the most cost effective solution.

Storage - We purchased a Clariion CX3-20 series SAN. We will go live with 11.1TB of total storage (2.1TB of fast, Tier 1 storage for database transactions and 9TB of secondary, Tier 2 storage for files). A single CX3-20 will allow us to expand in a modular fashion to accommodate up to 1200 practices. We'll also be leveraging a disk to disk backup strategy, using tape only for disaster recovery.

Network Infrastructure – We implemented a high speed network backbone with multiple paths for redundancy using
* Cisco Integrated Services Routers (ISR) 2811s for internet connectivity
* Adaptive Security Appliances (ASA) 5520 for Firewalling, Intrusion Protection and IPSec VPN Client termination
* Catalyst 4948 Switches for Server connectivity and layer 3 routing
* MDS 9000 Series Multilayer SAN Switches for SAN connectivity

Security – We incorporated physical, technical and administrative controls to protect confidentiality, integrity and availability.

SSL Accelerators - We are using Array Networks TMX-2000, the hardware recommended by eClinicalWorks to optimize web server performance.

Redundancy & Disaster Recovery - One of the real challenges to this project is the price sensitivity of our private clinicians. We needed to build a world class system at a price that all clinicians could afford. Redundancy and disaster recovery is like life insurance - it's a great investment only if you need it. We had to balance our infrastructure
investment with total cost of ownership, given the fixed hospital contribution and physician frugalness. In the end we used the equation

\[ \text{Risk} = \text{likelihood of bad events} \times \text{impact of bad events}. \]

We believe that it is much more likely that a component will fail than an entire data center be destroyed, so we elected to build a highly redundant infrastructure in a single data center for now, expanding to a secondary data center once we have sufficient clinicians signed up to fund the new infrastructure. Networking gear, servers, power and cabling are duplicated within a commercial co-location facility. Storage is disk to disk redundant. Tapes are moved offsite nightly. Once the hardware is up, we'll work with Concordant, Cisco, EMC, HP, Array Networks, and the Co-Location facility to test physical hardware and operating system/database software redundancy. Then we'll install eClinicalWorks and run the redundancy tests again. We'll also engage Third Brigade at that time for intrusion/security testing.

We've written a comprehensive disaster recovery plan and if we lost the co-location facility due to disaster, we would recover the tapes from offsite storage and build a replica of the hosting environment (VMWare plays a key role here) and restore the data. The recovery point and recovery time objectives for this plan will be clearly communicated to all who sign up for service. The customer base for our Software as a Service solution is mainly small practices which operate Monday through Friday 8am-6pm. Our disaster recovery plan includes a solid practice/workflow specific contingency/downtime plan. We will also perform a mock downtime as part of each implementation.

By creating a highly redundant single data center with rack mounted servers, two tiered storage, virtualization and offsite tape backup, we believe we've balanced scalability, affordability, and maintainability. We go live this Summer and I'll let you know if we were right!

POSTED BY JOHN HALAMKA AT 3:42 AM

1 COMMENTS:

j_b_f said...

John - not sure if you've been keeping up with Amazon's recent cloud computing developments (EC2/S3/SQS) ... certainly not (yet) appropriate for EMR use but interesting nonetheless.

Companies like ELASTRA are building value-added products on top of Amazon's stack. It's only a matter of time before someone offers a similar service with a strong SLA and HIPAA compliance.
I'm not sure if you've spoken to this before, but how do you generally evaluate hosted/managed software and services within your organizations?

MARCH 4, 2008 8:06 AM

ABOUT ME

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VIEW MY COMPLETE PROFILE
Electronic Health Records for non-owned doctors - staffing the project

This is my sixth post in the series about Electronic Health Records for non-owned doctors. This week, I'll discuss the complexities of staffing the project, since we've had to weigh insourcing versus outsourcing, costs, and service levels to arrive at a balanced staffing plan. We've divided the staffing into 10 categories and below I describe the strategy for each.

In creating this staffing model, we had several considerations:

* The project scope is not fixed. We’re starting with 300 clinicians and may implement over 1000. Thus, we need a staffing model which is scalable on demand. We may need to flex the size of our teams up or down depending on implementation schedules.
* In Massachusetts, at this time, it is challenging to hire and maintain healthcare informatics staff because of intense competition among hospitals implementing CPOE/EHRs and local software companies expanding their healthcare IT workforce.
* Outsourcing can be a way to rapidly expand capacity but it requires diligent management and tends to be more expensive than hiring internal staff.

1. Project Management and Financial Management
We have a fulltime Project Director and have leveraged our existing IS fiscal staff to manage the budgets. We will partner with the Massachusetts eHealth Collaborative to operate a project management office under the direction of our Project Director but jointly and flexibly staffed with BID and MAeHC personnel. This will allow us to:
   a. Complement our existing knowledge of hospital and employed-practice deployments with outside expertise regarding non-owned ambulatory practices
   b. Ramp up staff strength quickly as implementation intensity grows
   c. Ramp down smoothly as deployment transitions to long-term support. This model will also allow us to rapidly and seamlessly plug in the temporary project management
and staffing gaps that will inevitably arise during the course of the project.

2. Technical Design and Engineering
We elected to insource design and engineering for our servers, storage, and network design. We collaborated with our vendors - HP, EMC, and Cisco, as well as our infrastructure implementation partner, Concordant, on these designs. We assigned .25 FTE of the manager of our Ambulatory Applications group to this task.

3. Central Site Construction
We elected to outsource construction of the central hosting facility to Concordant for a fixed price. They acquired the co-location space, installed all equipment, and took responsibility for establishing power/cooling/network connectivity to the site. They will also manage the central site during the pilot phase. We are paying for a deliverable rather than paying per diem rates for time or purchasing FTEs.

4. Office Hardware Deployment
We elected to outsource office hardware deployment to Concordant by purchasing a team of people which scales in direct relation to the number of offices we are implementing. Purchasing a deployment team rather than working on per diem rates means that we paying for FTEs assigned in direct relation to the deliverables.

5. Practice Consultation
We elected to insource and outsource practice consultation. An MAeHC senior consultant will directly manage the practice consultant team, which will comprise both BID and MAeHC consultants. These practice consultants will be assigned to individual practices and will provide end-to-end project management of practice-level implementations, to ensure that all activities associated with the implementation are synchronized. They will also work with individual practices on optimizing workflow and translating that optimized workflow into appropriate software configuration, hardware layout, and training approach. As with the project management function, this is a flexible insource/outsource model that allows us to scale up and down rapidly, tap into existing expertise and apply it to the project right away, and maintain an adaptive but robust capability to meet program changes as they arise.

6. Training
We elected to insource and outsource training. eClinicalWorks will provide the training for all our initial pilot sites then train our trainers. Going forward a combination of eCW and insourced trainers will serve our sites, with supervision/quality control of all training to be provided by eClinicalWorks.

7. Central Site Operations
We elected to outsource central site operations to Concordant via a "lights out data center" model coupled with systems and application administration. They provide monitoring tools and problem escalation 24x7 rather than hiring a specific number of staff to manage our installation. This enables us to leverage the fact that they are providing support to other customers and projects, keeping our costs low and avoiding the need for us to hire fractional FTEs to provide data center support. The challenge
with hiring internal staff to do this is that we expect data center needs to be higher during our initial implementation because of the build/change activities, then markedly reduce during our steady state operations. Outsourcing this function to Concordant, which spreads FTEs over many customers, enables us to flex our needs easily.

8. Help Desk, Tier 1 and Tier 2 Support
We elected to insource and outsource telephone support. Concordant will be the initial single point of contact for all phone calls, doing Tier 1 support such as password resets and then triaging Tier 2 Support. They will handle infrastructure Tier 2 issues and escalate others (such as EHR best practice questions) to our insourced staff. Our staff will escalate eClinicalWorks specific issues to eCW as needed. By focusing on resolving as many questions as possible remotely and dividing support between Concordant, our staff, and eCW, clearly defining the tasks of each group, we minimize our costs.

9. Field Support
We elected to outsource field support to Concordant, using a shared staff model. This optimizes our costs, coverage and flexibility since here again Concordant spreads FTEs over multiple customers.

10. Security auditing
Security has been built into our project from the very beginning as part of our infrastructure design, application configuration, and staffing model. We elected to outsource security auditing to an expert ethical hacking and security firm, Third Brigade for a fixed price. By hiring an expert group to do this, we provide another layer of vigilance and control, ensuring we have an outside party validating our configurations, providing host based intrusion protection, and monitoring our systems.

Thus, by dividing the staffing of the project among the members of our "dream team" - BIDPO/BIDMC, Concordant, Massachusetts eHealth Collaborative, eClinicalWorks and Third Brigade - we have achieved an affordable, scalable, balanced insource/outsourcing staffing model.

More to come as we test this model in production this Summer!
John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.
Electronic Health Records for Non-owned Doctors - Creating the Model Office

There are many reasons for implementing electronic health records - enhancing quality, clinical integration, reducing redundant testing, and building workflow efficiency with technologies such as e-Prescribing.

Today, we have 300 closely affiliated non-owned doctors in 150 practices. Although these doctors are not employed by our system, they are part of the Beth Israel Deaconess Physician’s Organization (BIDPO) which is a coordinated provider network of nearly 1500 physicians. Among other quality and safety measures, BIDPO focuses its Pay for Performance efforts on advanced diabetes care, appropriate radiology test ordering, and use of e-Prescribing.

Gathering metrics about physician practices requires consistent clinical and process data about the care delivered. This means that all our practices should maintain ICD9 codified problem lists, accurate medication histories, standard-based result reporting, and structured data about lifestyle choices such as smoking behavior. Unless our clinicians have a consistent way to record this data, quality and pay for performance reporting will be impossible since clinicians would implement their own unique ways of recording problems, medications, allergies and notes.

Hence, we're designing the "model office" configuration for eClinicalWorks 8.0, the version of the EMR software we’ll be implementing. This means that before our first goal live, we’re developing data dictionaries that will be used in all practices. We’re loading the decision support rules which will provide identical alerts and reminders to every clinician. We’re integrating all the lessons learned from the Massachusetts eHealth Collaborative rollouts to design the idealized configuration of each EMR screen which will ensure the best quality data capture and enhance the likelihood that we can do performance measurement as a clinically integrated community of clinicians.
Part of our model office also includes idealized workflow made possible by interoperability. Each office will have

1. New England Health EDI Network (NEHEN) which provides electronic links to our regional payers for HIPAA transactions including benefits/eligibility, referral/authorization, claim submission, and claim status
2. MA-Share RxGateway for e-Prescribing features such as formulary enforcement, community drug history, and routing to retail/mail order pharmacies.
3. Results interfaces for labs and radiology from local hospitals
4. Ordering of BIDMC-based testing including SafeMed radiology decision support
5. Quality and performance reporting via build in eClinicalWorks 8.0 data query system.

Since our model office includes a standard configuration of all data dictionaries and input screens, we’ll be able to use a federated approach to performance measurement. Here’s how it works.

a. BIDPO has been given the authority to collect performance data by all BIDPO clinicians using eClinicalWorks
b. BIDPO devises a query such as "How many patients in each practice with diabetes have a hemoglobin a1c greater than 7"
c. At night, while the office is closed, the query runs on each clinician’s database
d. The aggregate counts (not individual patient identified data) are returned to the medical director for use in pay for performance measurement and medical management

Creating the model office ensures that patients will receive the same quality care wherever they go, that doctors will be empowered with decision support tools, and that we’ll be able to measure performance at all our practices as if they were a single integrated entity. We believe the up front work to design the model office will make our use of eClinicalWorks more effective, make training easier, and serve as a foundation for all our interoperability efforts. As we complete the model office designs, I’ll post the details.

POSTED BY JOHN HALAMKA AT 7:14 PM

1 COMMENTS:

Topher said...

With the data available for pay for performance metrics, I wondered if there is any plan to look into data envelopment analysis (DEA) to look at comparable efficiency across the network?

If you are unfamiliar with DEA, then take a look at www.deazone.com or the wikipedia entry.
Great blog!

MARCH 26, 2008 9:54 AM

ABOUT ME

JOHN HALAMKA

John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.

VIEW MY COMPLETE PROFILE
Electronic Health Records for Non-Owned Doctors - Funding

By JOHN HALAMKA

Over the past two months, I’ve written about Electronic Health Record project management, architecture, planning, technology, and staffing, but the hardest part of the entire project is "What's it going to cost and who's going to pay". Stark safe harbors allow hospitals to support up to 85% of startup and implementation costs, excluding physician office hardware.

I asked the leaders of every major EHR rollout project in Eastern Massachusetts to comment on their funding model. Here's their feedback by institution:

BIDMC
BIDMC and Beth Israel Deaconess Physicians Organization have selected eClinicalWorks as the EMR, have outsourced desktop/centralized hosting to Concordant, and have a combination of insourcing/outsourcing to the Massachusetts eHealth Collaborative for practice consultation. BIDMC financial modeling of all these costs is consistent with the industry standard experience of $40,000-$60,000 per clinician including office hardware. Subsidies will come from BIDMC and local hospitals. With maximum Stark allowable subsidies, our computation of the minimum legal cost per clinician is $15,000, so clinicians will be asked to pay at least that much.

Caritas
Caritas has selected eClinicalWorks as the EMR. Caritas would like to subsidize 85% of the allowable costs. However, Caritas leaves the amount of the subsidy up to local hospital CEOs, since they will ultimately pay the bill and decide which community practices are the most strategic for rollout.

Children's Hospital Boston
Children's and Pediatric Physician's Organization at Children's have selected eClinicalWorks as the EMR and the hospital is hosting the application in their data center, maintaining it via existing IT staff. Six new FTEs in the primary care network will provide practice consulting and implementation services. Children's has outsourced desktop support to The Ergonomic Group. Children's experience has paralleled the BIDMC financial model and has roughly the same cost structure, subsidizing costs to the maximum that Stark allows.

Mt. Auburn Hospital
Mt. Auburn and Mt. Auburn Cambridge IPA have selected eClinicalWorks as the EMR and the physician's organization is hosting the servers in a co-location facility. The hospital has subsidized allowable costs and physicians are paying for all office hardware. The proportion of subsidy for costs of hosting, licenses, training and implementation is still a work in progress. Mt. Auburn notes that part of the cost equation should be consideration of loss of productivity during initial implementation. This is a good point and no other organization has computed this as part of the cost equation.

New England Baptist Hospital
New England Baptist hospital and its physicians have selected eClinicalWorks as the EMR and the hospital is hosting the application in a co-location facility. The hospital has hired 4 FTEs, managed by the hospital CIO, to assess office needs, install hardware and implement software. An MOU has been developed detailing the relationships between the parties, services to be provided, and funding allocation to ensure compliance with Stark. The hospital currently subsidizes 80% of the Stark allowable costs. The physicians are funding their portion of the costs via a combination of payer withholds, PHO funding, and direct physician payment.

Partners Healthcare System
Partners Healthcare offers their home built Longitudinal Medical Record or GE Centricity as the EMR. LMR is hosted centrally and GE Centricity is hosted in clinician offices. As a system, Partners uses withholds in its pay for performance contracts to fund EMRs. EMR adoption is a criterion for remaining in the PCHI network. No subsidy is provided from the central corporation. However, on the local level, Physician Hospital Organizations are subsidizing EMRs. Thus, Partners docs who are in community receive their subsidy and their incentive through pay for performance contracts, which could be a Partners physicians-hospital organization like Newton Wellesley, North Shore or could be a non-Partners physicians-hospital organization like Emerson, Hallmark.

Winchester Hospital
Winchester Hospital has committed to assist its physicians with the EHR implementation process and has budgeted $5 million, including $1.5M for a 4 FTE implementation support team, portal infrastructure development and associated connectivity. The remainder of the money is available for affiliated physicians to purchase and host the EMR of their choice. Winchester will subsidize up to 85% of the cost of EMR licenses and implementation. The support team primarily offers project management and is staffed out of a joint venture funded by the hospital and the IPA. Winchester hosts the hardware for the 15 practices that are under the corporate
umbrella (Winchester Physician Associates). The remainder of the practices are hosting applications in their offices with support from number of hardware/networking vendors. The IPA has its own incentive program unrelated to the hospital donation.

Thus, the overall consensus in the community is to subsidize the maximum or nearly the maximum of Stark allowable costs and to provide centralized project management with either insourced or outsourced implementation/practice consulting services. Most organizations are providing central hosting in a hospital or co-location facility.

In two weeks, I’ll provide an overview of the funding and staffing model for ongoing support of these practices once they are live.

POSTED BY JOHN HALAMKA AT 4:33 PM

2 COMMENTS:

swaters said...

The challenges facing a hospital led EMR implementation for non-employee physicians are significant. What’s it going to cost and who’s going to pay? The implementation will take time and money and at best be a distraction for the hospital. In the end they will have a system that works great for some practices and not so much for others.

Months and significant money will be spent on simply managing and planning the project. There is also the current instability in the ambulatory EHR market that will lead to a significant consolidation of products on the market as well as a number of failures. This could lead to a whole new implementation with a few years of roll out.

A strong alternative approach, particularly for smaller hospitals, would be partnering with an entity that has the technology and business model to provide these services at a much lower cost than the hospital. The provider could make available a broader range of services and choices to meet the needs of the individual medical practices and integrate them with the hospital IT systems.

The result would be a solution with a shorter delivery time and reduced capital expenditures that will better meet the needs of the medical practices themselves.
John Halamka said...

BIDMC has chosen a similar approach. Partnering with external firms to ensure scalability while doing contracting centrally to ensure consistency and clinical integration.

MARCH 26, 2008 5:01 PM

ABOUT ME

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John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.

VIEW MY COMPLETE PROFILE
SUNDAY, MARCH 30, 2008

Electronic Health Records for Non-Owned Doctors - Implementation Order

This is the ninth entry in my series about providing electronic health records for non-owned clinicians. We’ll call this one "triaging the practices". Since we have 300 non-owned clinicians who need electronic health records, where do we begin? If new clinicians join the Beth Israel Deaconess Physician's Organization during our rollout, how do their practices fit into the rollout?

We need specific triage rules to decide on the order of implementation.

In a for profit business, some metric like referral volume might be used, but in the non-profit healthcare world, such an approach would be a violation of Stark anti-kickback rules.

In our case, we want to ensure the highest quality care, coordinated through the use of interoperable electronic records. We want to ensure decision support is enabled for those who needed it most. We want to invest our effort into those practices which require the most clinical integration with the hospital to ensure high performance medicine. Based on a quality/safety approach, a rational implementation order would be:

1. Primary Care Physicians are the first priority - PCPs see a high volume of patients and are the "air traffic controllers" for care, ensuring coordination among all the clinicians a patient sees. An EHR enables an accurate problem list, an up to date medication list and alerts/reminders for wellness care. We want every patient's PCP to have the benefits for an EHR. Yes, we know that the first few months of using an EHR will impact a PCPs productivity, but our experience with other EHR implementations is that with appropriate training and a "model office" configuration, productivity rapidly returns to baseline.
2. Specialists who serve as a kind of primary care giver, managing diseases such as congestive heart failure, cancer and diabetes are also a priority to be early EHR users. Tracking diabetes care requires data coordination among endocrinologists, Ophthalmologists, and Vascular surgeons. Ob/Gyns are primary care givers. Chronic diseases such as COPD and CHF require coordination among pulmonologists, cardiologists and PCPs. Specialties that require significant care coordination with primary care givers or deliver primary care themselves include Cardiology, Ophthalmology, OB/GYN, Dermatology, Orthopaedics, Urology, Gastroenterology, Surgery, Pulmonary, Neurology, Endocrinology, Vascular, and Rheumatology.

3. As we are rolling out EHRs to these PCPs and specialists, it's likely that new clinicians will become affiliated with BIDMC. As we plan our rollout calendar, we will need to stay flexible so that new PCPs get priority and the specialists who most benefit from care coordination are placed ahead in the queue.

This approach to triage ensures that patients and providers get the maximal benefit from our efforts as we rollout 6 practices per month starting this Summer. We may need to refine our rules even further as we learn more from our rollouts:

* PCPs with a closer geographical location to BIDMC/a local hospital go first, since they have the most data interoperability needs. * Clinicians near retirement may choose not to be early adopters and may want to stay on paper. * Some practices may more easily adapt to new technology than others and should go sooner

Over the next few months, the hospital and the physician organization will finalize the triage rules based on quality, safety and data sharing benefits, so it is very clear that we are Stark compliant and can easily explain to every non-owned physician when their EHR will be implemented based on objective criteria. I'll let you know how it goes!
Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.
Electronic Health Records for Non-owned doctors - Support

This is my tenth entry about providing electronic health records for non-owned doctors. The previous entries have described the efforts to go from vision to live implementation. The subject of this post is support after go live and ongoing operational funding. As with my post about implementation funding, I’ve asked all the implementers of EHR projects in Massachusetts to comment on their plans.

BIDMC
At BIDMC, we'll provide a central help desk (Concordant), outsourced desktop/network support (Concordant), and ongoing application support (internal staff, Mass eHealth Collaborative staff and eClinicalWorks). Clinicians will pay a fixed monthly rate for this service. We'll centrally contract for all these services, so the cost will be as low as possible. BIDMC may pay for the ongoing operation of the centrally hosted eClinicalWorks system (i.e. rent in the co-location data center, server support staff) and this is still under discussion.

Caritas
Cartias is evaluating their strategy for ongoing support. They are considering the possibly of reassigning members of the implementation team to support as implementation is completed. The have not yet identified a specific funding model for support, but are considering an approach similar to BIDMC.

Childrens
Children's will provide a similar model to BIDMC. The help desk function and first tier application support will be outsourced to a third party vendor (The Ergonomic Group). They will escalate to eClinicalWorks as necessary. Ergonomic will also manage and support network operations at each of the practice sites. Children's will support the central hosting site hardware and infrastructure. Children's will also support all network operations inside the core data center. Clinicians will pay a fixed monthly rate for this
Mt. Auburn Hospital/MACIPA
Mt. Auburn/MACIPA will provide a central help desk and ongoing hardware/application support. They are currently retraining clinicians to help them increase the utilization of the product, given that during the initial training there is only so much a physician can absorb. They also intend to also hold classes at the IPA periodically. Post live financial support is still being discussed.

New England Baptist Hospital
NEBH will provide an outsourced help desk, ongoing hosting, and application support. Clinicians will pay for non-Meditech interfaces, software maintenance, and connectivity/support to billing companies.

Partners
Partners will follow the same model as BIDMC, with clinicians funding ongoing support services.

Winchester
Community physicians will fund ongoing software and hardware support. The team in Highland Management (joint venture between the hospital and IPA) will provide guidance in the development of templates and the use of the system for reporting to meet P4P goals and clinical integration. Winchester IT will also be involved in the development of interfaces and the transfer of patient data for care delivery.

This post marks the conclusion of my first series about electronic health records for non-owned physicians.

Today, the BIDMC Finance Committee approved our pilots, so we’ll be moving forward with all the plans I’ve outlined. This is a major milestone for our project that enables all our contracts, service level agreements and spending to progress.

My next series about this topic will start in July as our pilots go live. I’m sure there will be many more lessons learned to share including comments on budgets, practice workflow transformation and loss of productivity. I hope these first 10 posts about planning the project have been useful to you!
JOHN HALAMKA

John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.

VIEW MY COMPLETE PROFILE
LIFE AS A HEALTHCARE CIO
EVERY DAY I EXPERIENCE LIFE IN THE WORLD OF HEALTHCARE IT,
supporting 3000 doctors, 18000 faculty, and 3 million patients.
IN THIS BLOG I RECORD MY EXPERIENCES WITH INFRASTRUCTURE,
APPLICATIONS, POLICIES, MANAGEMENT, AND GOVERNANCE AS WELL AS
MUSE ON SUCH TOPICS SUCH AS REDUCING OUR CARBON FOOTPRINT,
STANDARDIZING DATA IN HEALTHCARE, AND LIVING LIFE TO ITS
FULLEST.

HTTP://GEEKDOCTOR.BLOGSPOT.COM/2008/06/EHRS-FOR-NON-OWNED-DOCTORS-ROLES-AND.HTML

TUESDAY, JUNE 3, 2008

EHRs for Non-Owned doctors - Roles and Responsibilities

As promised, it's June and BIDMC has begun the implementation of our Software as a Service Electronic Health Record for non-owned clinicians. As we "market" the practices on the idea of using a hospital subsidized electronic health record, we need to have all the details ready - the costs, the service levels, and a crisp definition of the roles and responsibilities of each member of our team. Since the project is comprised of 5 insourced and outsourced groups working seamlessly together (BIDMC, Massachusetts eHealth Collaborative, eClinicalWorks, Concordant, and Third Brigade), we need to have unambiguous agreement among our teams as to who will do what, who will be accountable and who will communicate the handoffs.

To ensure a perfect understanding among all stakeholders, we created a Roles and Responsibilities Matrix. There are two aspects of this work that are generally useful to other hospital systems implementing electronic health records.

1. We've defined all the component parts of an implementation, from training, to desktop support, to security

2. We've classified the roles as
   Responsible - the person or team who does the work
   Accountable - the person or team who reports on the work and is ultimately held responsible for its completion
   Consulted - the person or team who provides an opinion when consulted as a stakeholder
   Informed - the person or team who is told about the decisions made and progress achieved

Each of the 5 team members will sign off on the matrix so that there will be no misunderstandings or finger pointing.
When implementing large, complex projects, adding extra details like a roles and responsibility matrix prevent future problems. Assumptions can get teams into trouble. Well documented understandings keep everyone friendly. I hope you find it useful.

POSTED BY JOHN HALAMKA AT 3:00 AM

3 COMMENTS:

Rizwan ud Dean said...

Would you consider implementing a BCP/DRP with this project?

My assumption at this stage is that something which seems this critical would also be part of your BCP?

Cheers

JUNE 3, 2008 12:14 PM

John Halamka said...

Business Continuity and Disaster Recovery are already part of the design.

See

http://geekdoctor.blogspot.com/2008/03/electronic-health-records-for-non-owned.html

JUNE 3, 2008 3:43 PM

The Critical patient said...

Is it OK to use the spreadsheet, with attribution of course?

JUNE 4, 2008 7:42 PM
ABOUT ME

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VIEW MY COMPLETE PROFILE
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<th>Concordant</th>
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EHR for Non-Owned clinicians - Coming to Terms

Since our community EHR infrastructure is now built we're in an education and communication phase, explaining to clinicians what it does, what it costs, and what they can expect. All our written and verbal communication must be consistent to ensure we set the right expectations. Part of being accurate is a precise definitions of our terms - what is an EMR, EHR, PHR, HIE, RHIO etc. The consensus definition work of NAHIT and AHIMA was presented to AHIC last week. Although not everyone will agree with these definitions, they are starting point. At AHIC one public comment illustrated the problem of legacy definitions - NextGen markets its product as the NextGen EMR. Does that mean it is inferior to the eClinicalWorks EHR, since an EHR is defined as standards-based and interoperable, while an EMR is defined as a single institution’s standalone record. At BIDMC, we’re providing a community EHR, we have an institutional EHR called webOMR (Online Medical Record), and a PHR called Patientsite. Patientsite is fully interactive with multiple data sources and Google Health, so we can continue to call it a PHR per the definition below. Here's the summary of the NAHIT work:

**Electronic Medical Record**
An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.

**Electronic Health Record**
An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff, across more than one health care organization.

**Personal Health Record**
An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.

*Health Information Exchange*  
The electronic movement of health-related information among organizations according to nationally recognized standards. HIE is a verb describing a process.

*Health Information Organization*  
An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards. HIO is a noun describing an organization.

*Regional Health Information Organization*  
A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.

Next week’s entry about our non-owned clinician project will provide an overview of our Health Information Exchange activities.

**POSTED BY JOHN HALAMKA AT 3:00 AM**

2 COMMENTS:

DanCorwin said...  
As a patient, I’d hope that my evolving EHR will contain a clear, useful summary of my overall *current* clinical condition. By aggregating data on me from multiple (pro) sources, an EHR has enough information to let software assemble this, but your definitions omit this key difference from EMRs.

The EMR data I’ve seen, by contrast, seems more like a list (or pile?) of disjoint notes on the actions of individuals at one provider. My impression: EMRs are really for billing, not care-giving. They track neither my latest known meds nor my general state of health - summary sections good to have readily at hand if any part of either changes.

I could periodically confirm (or help fix) such a summary, but instead I selectively dump bits of it at each visit from my own fallible memory. It and recent local EMRs give caregivers an inconsistent image of me, which I’ve seen can add confusion and waste time.
Concise clinical profiles seem another type of "low hanging fruit" one could capture into EHRs, initially by mining discharge summaries. If not there already, please consider adding that design goal to the agenda for your June 17 retreat.

JUNE 13, 2008 1:46 PM

John Halamka said...

I completely agree. At BIDMC, we've created a medication list and problem list which is editable by any clinician or nurse, resulting in a lifetime medical record, not a huge collection of disjointed records for each episode of care. The clinical summary format HITSP has created for care continuity is the kind of summary profile you suggest. Mine is at here

JUNE 15, 2008 5:54 PM

ABOUT ME

JOHN HALAMKA

John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.
EHRs for Non-Owned Clinicians - Loss of Productivity

As we implement EHRs for BIDPO practices, several clinicians have expressed concern about the loss of productivity during the first few months post go live.

What's been the experience for private clinicians implementing EHRs in Massachusetts thus far? The Massachusetts eHealth Collaborative implemented 600 clinicians over the past 3 years and generally found:

1. There was not a sustained drop in revenue. Indeed, clinicians had the opposite problem with most practices. MAeHC wanted practices to cut back on patient load during training and go-live, but most of them refused because they didn’t want a revenue reduction. On eClinicalWorks, most practices that did cut back were back at full-patient load within 2-4 weeks of go-live. MAeHC did have a few (literally 3 or 4 out of 150) practices who experienced a cash flow reduction because their clearinghouse transition went awry (generally due to the clearinghouse vendor). This usually took a short time to resolve and then they were quickly back to baseline.

2. During the first few months after go-live clinicians worked harder than before because they entered selected historical data into their EMRs for upcoming patients and sometimes staying later to get the same number of visits in as before. After 3-4 months clinicians started seeing some of the same patients cycle through, and that’s when they started to see the productivity benefits of an EHR.

3. The industry averages on productivity loss are for practices who did not have the type of preparation and end-to-end practice consulting that MAeHC and BIDMC invested in. For the BIDPO rollout, we are leveraging the practice transformation lessons learned from MAeHC. Based on the experience the MaeHC has had and the fact that we’ve assembled an implementation dream team of the same folks who implemented the 600 docs of MAeHC, we do not believe we will have a significant reduction in billing or
productivity.

I'll summarize the impact when our data is in this Fall.

POSTED BY JOHN HALAMKA AT 3:00 AM

1 COMMENTS:

Ian Furst http://www.waittimes.blogspot.com said...

for what it's worth John when we switched to EMR (with schedule and patient tracking) our average daily revenue went up for the next 8 quarters. 18%, 18%, 11%, 5%, 8%, 3%, 6%, 6%. Better control of patient flow far outweighed productivity losses due to electronic charting. Also, within a year or two we'd learned most of the tricks. The only real time killer was login/logout in terminal sessions.

JUNE 17, 2008 4:40 PM

ABOUT ME

JOHN HALAMKA

John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.

VIEW MY COMPLETE PROFILE
Electronic Health Records for Non-owned clinicians - Sharing Data Among Providers

At times, the business case for interoperability is not entirely clear. If data sharing reduces the volume of redundant lab tests, then the healthcare system as a whole wins, but someone loses revenue.

Over the past year, I've seen a remarkable change in attitude among clinicians in Massachusetts communities. They are demanding data sharing. Here's the history, the specifics of the clinician requests, and the plan for making it happen.

When we first conceived our hosted software as a service model to provide electronic health records for non-owned clinicians, we designed one way interoperability. BIDMC has an ambulatory record called webOMR which contains the problem lists, medication lists, allergy lists, notes/reports, labs, and imaging studies for 3 million patients. We worked with our community EHR vendor, eClinicalWorks, to create a seamless web service that links eClinicalWorks to webOMR such that community physicians can securely view BIDMC data from inside eClinicalWorks without having to login again or use a separate application. However, we did not design a link between eClinicalWorks and webOMR to enable a BIDMC hospitalist or ED physician to view individual patient identified private practice data.

We did design aggregate data sharing such that the medical director of the Physician’s organization could query private practices to retrieve performance, quality and outcomes data in support of pay for performance contracts.

As we began to communicate the vision of a community EHR, our private practice clinicians starting asking three questions:
1. How does a Primary Care Provider send a clinical summary to a Specialist?
2. How does the Specialist close the loop with the Primary Care Provider by sending an
electronic consult note?
3. How does a hospital-based physician such as an Emergency Department clinician, hospitalist, or anesthesiologist retrieve patient summary records from private practices?

My initial response was that private practice data sharing is such a novel idea, that it would have to wait until after our EHR rollout was complete to formulate a strategy.

Clinicians were not satisfied with that approach. Thus, we’ve decided to accelerate our work on private practice data sharing by creating a clinical summary repository for all our eClinicalWorks users using the eClinicalWorks EHX product.

Here’s how it will work.
1. Whenever a patient visits one of our BIDPO community clinicians, the documentation of their visit will be done in our hosted software as a service eClinicalWorks application.
2. Patients will be consented by the clinician for community data sharing via opt in consent at the practice level. Consenting at one practice implies that data from that practice can be shared with other practices, but not visa versa.
3. When the encounter is complete, a summary record including problems, medications, allergies, notes, and labs will be forward to the eClinicalWorks EHX repository using the Continuity of Care Document format.
4. Other clinicians, who are credentialed members of BIDPO will be able to view summary records from this repository, assuming the patient has consented to sharing that data.
5. An audit trail of all such lookups will be available to enforce security

Such an approach solves the PCP to specialist clinical summary issue, the specialist to PCP communication issue, and the hospital-based viewing of private practice records issue. From a technology perspective, it’s an elegant solution that reduces the number of interfaces. All practices send their summaries to a repository in a standard format, then all exchange is done from that repository.

A similar approach has been used in the Massachusetts eHealth Collaborative pilots in North Adams, Newburyport, and Brockton to enable secure, patient consented data sharing in those communities.

This approach needs one additional architectural element - how do you share data among EHX repositories, with non-eClinicalWorks EHRs or hospital information systems like Meditech.

MA-Share provides the grid infrastructure in Massachusetts to enable community to community data sharing. Today, MA-Share’s Gateway can push Continuity of Care Document Summaries from one organization to another. Over the next two years, we’ll work with eClinicalWorks to expand this capability to push clinical document summaries between instances of EHX. This means that BIDMC will be able to push a discharge summary or other clinically important information to a community repository, where with patient consent, the clinicians of a community caring for the patient will be able to view the data, ensuring continuity of care.
I expect all of this bidirectional data sharing to be a journey. We're purchasing the EHX product as part of our licensing of eClinicalWorks software and will use it initially for performance reporting. But we'll configure it so that sharing of data between clinicians and among communities will be possible. I expect all these features to be implemented by 2011.

I'm hopeful that our BIDPO clinicians will be satisfied by our strategy to embrace bidirectional data sharing in this incremental way - sharing data from BIDMC, sharing aggregate private practice data, sharing data among private practices using eClinicalWorks, then sharing data among communities and hospitals.

POSTED BY JOHN HALAMKA AT 3:00 AM

6 COMMENTS:

rabbinical counselin said...
I've been following this blog for a while now and i really like it alot!! As a college student interested in Health IT this really gives me a real world view of what's going on.. EHR talk is one of my favorites, im still not used to all the terms that professionals like you use on a daily basis, but i figure if i keep reading it'll all make sense.. thank you for starting this blog in the first place.

JUNE 24, 2008 8:54 PM

Bob said...
Hi Dr H,

How did you decide which data elements would be included in the shared clinical summary?

JUNE 25, 2008 7:45 AM

citizencontact said...
(this is a comment I made to http://news.cnet.com/8301-13505_3-9976958-16.html )

This is issue has personal relevance since I have to apportion over 20-40 pills
daily for a sick relative. There should have been a simple online system for helping manage this. The Google Health system API makes this more likely (there is already one application that does this, though seems very buggy. Open standards and open source would make this effort much better.

However, the United States makes this effort problematic by not having a comprehensive and universal health care system. Since health information is used to deny health care and employment (whether legal or not, since there is no guarantee which developed societies have as a given), the incentives run counter to normal networked systems and applications.

This is hard to prove in the abstract, but should become apparent if you understand the nature of networks that grow in power as they reach 100% of the potential audience and the analogous situation that a society is healthier person by person as closer to 100% is given the best care (e.g. vaccines, etc).

Nonetheless, we should support the effort of Dr. John Halamka, because by moving ahead on this open standards/source effort that may help explain the 100% is best rule for networks in the context of health care.

JUNE 25, 2008 8:37 AM

Graham Barden said...

I am the managing partner for a 10 doc, three-site pediatric practice in NC. I just found your blog after it was recommended by a doc in Australia...
I have been reluctant to consider EMR since our paper seems to work well for us. (Preprinted forms, state electronic vaccine registry, good PM system) We don’t have patients on multiple medications since most kids are quite healthy. And in pediatrics, infant/child/adolescent problems can be very different for the different life stages so I am not convinced that I could practice better with an EMR. We did try electronic prescribing, but found it difficult to tailor the scripts for the varying dosages of drugs found in pediatrics.
(if the amount needed was 110 cc’s, and I know the product came in only 100 cc
bottles which would have been adequate, the program would "force" the pharmacist to fill 110 cc's - ie, charge twice as much and throw away 90 cc's...

But my biggest reluctance stems from the lack of portability of the data once we spend the considerable effort to create it. If the vendor is acquired by another or decides to focus exclusively on another specialty, or dies, we would be stuck! I am very worried about entering into a business agreement without an exit. I feel that as per Business 101, if you cannot easily extract yourself from an unsatisfactory business relationship, you are essentially "owned" by the other entity. And there is no real incentive for an EMR vendor to design their product so you can leave easily.

I am not as worried about real-time exchange of data as I am with long term graceful extraction from a failed business decision.

Is headway being made on the problems associated with migration to a different EMR?

-Graham Barden

JUNE 25, 2008 9:02 AM

John Halamka said...

Thanks for all these great comments. For clinical summary exchange we elected to use the Continuity of Care Document which includes problems, medications, allergies, labs, results, and also next steps for followup. Here's an example of one of our production documents.

These summaries are exchanged from provider to provider via the MA-Share gateway and the eClinicalWorks EHX repository for eClinicalWorks users.

This standard format makes the EHR data completely transportable.

JUNE 26, 2008 8:59 AM

David said...
Hello, Doctor.

The doctor in NC seemed to be asking without knowing it for an online EMR system designed as software as a service. I am wondering if this where eClinicalWorks is heading. And do you think it would be the answer to getting the primary care doctors to buy into EMR so that the Personal Health Record could become more meaningful?

JUNE 28, 2008 12:05 AM

ABOUT ME

JOHN HALAMKA

John D. Halamka, MD, MS, is Chief Information Officer of the CareGroup Health System, Chief Information Officer and Dean for Technology at Harvard Medical School, Chairman of the New England Health Electronic Data Interchange Network (NEHEN), CEO of MA-SHARE (the Regional Health Information Organization), Chair of the US Healthcare Information Technology Standards Panel (HITSP), and a practicing Emergency Physician.

VIEW MY COMPLETE PROFILE