MEDICARE PAYMENT ADVISORY COMMISSION

PUBLIC MEETING

Ronald Reagan Building
International Trade Center
Horizon Ballroom
1300 13th Street, N.W.
Washington, D.C.

Thursday, October 28, 2004
9:32 a.m.

COMMISSIONERS PRESENT:

GLENN M. HACKBARTH, Chair
ROBERT D. REISCHAUER, Ph.D., Vice Chair
JOHN M. BERTKO
SHEILA P. BURKE
FRANCIS J. CROSSON, M.D.
AUTRY O.V. "PETE" DeBUSK
NANCY-ANN DePARLE
DAVID F. DURENBERGER
ARNOLD MILSTEIN, M.D.
RALPH W. MULLER
CAROL RAPHAEL
WILLIAM J. SCANLON, Ph.D.
DAVID A. SMITH
RAY E. STOWERS, D.O.
MARY K. WAKEFIELD, Ph.D.
NICHOLAS J. WOLTER, M.D.

AGENDA ITEM:

Health IT panel
-- Gregg K. Omura, Primary Care Partners, P.C.
-- James M. Walker, Geisinger Health System
-- Clement J. McDonald, Regenstrief Institute

DR. OMURA: Thank you very much. I guess I'm the example of the little office that could. Back over 10 years ago we started our involvement in electronic records. We're a five-doctor office now with a PA, a nurse practitioner. We do family practice. We're located in rural western Colorado. We feel a little bit isolated out there. About four years ago we did merge with two other primary care offices to make up Primary Care Partners, so we now have an urgent care facility, a diagnostic facility and we have about 30 or so physicians in our group, so we're a little bigger than how we started out.

Back in 1993, which was quite a while ago as far as EMRs are concerned, our problem was that we had no further space in our current office for charts. Our chart racks were full. We needed more administrative staff and we had no places for those people to sit. In addition to that we had the paper record dilemma of charts all over the place, and the fact that information wasn't immediately available when it was needed.

So we had a front office staff that had grown to 7.5 FTEs and personnel costs were starting to become an issue as well.

Our options were to build a $200,000 addition to our office, have two chart rooms, add more staff. None of that sounded terribly appealing to us. Or to consider implementing an electronic medical record system. Initially upon looking at that it looked like it would cost about half the cost of the physical expansion. So it was less costly. The future of medicine in our view was not more investment in bricks and mortar, and that information technology and information management was likely to be at the very core of a successful physician in the 21st century.

So with these two options we decided to look at programs that were available at that time, and remember in 1993 there were many fewer programs out there than there are now. We evaluated a dozen systems and selected and EMR based primarily upon potential efficiency and cost savings, which I would suggest not all doctors do. So if you're not looking for improved efficiency you probably won't get it.

We obtained a loan for the purchase of the system for about $125,000 back in 1993, and that's in the ballpark of what we're talking about these days. We implemented the system in 1993 and went completely to a paperless office. We didn't have the resources to be doing duplicate paper and electronic entry.

We installed computers and printers in every exam room and at every workstation. Every staff member and every doctor had a

computer in front of them at all times. The computer actually ended up being not just the EMR but was also the center for all information flow within the practice. We were electronically connected with both hospitals, so we could look up laboratory results, we're connected to the Internet. So it became a very important part of our day-to-day care.

Immediate outcomes. All staff members with the exception of one were able to adapt well to the new system, and the doctor and staff saw tremendous value in the EMR. Our front office staff decreased from 7.5 FTEs to about four. And remember, 7.5 was actually not quite enough at the time. Our transcriptionist dropped from 1.5 FTEs down to one-half FTE, so we actually saved four or five FTEs, mostly in the front office as a result of the implementation.

A later office remodel converted previous administrative space, chart rooms and filing areas, to clinical space and I think that was quite helpful for our practice as well.

In terms of immediate outcomes, patient records were always available whenever and wherever they were needed including the physician's homes. We're all connected with high-speed lines to the office. Our urgent care facility was connected directly, the emergency room, the hospital and both hospital floors were connected. So we had access whenever we needed to when we interacted with patients.

The clinical data was better organized and easier to retrieve. That was a benefit to us. In terms of dollars and cents, our overhead went down 6 percent the first year of use of the EMR. We saved about $60,000 that year, which means we recovered our investment in approximately two years, which was our plan. At that level we probably have saved $500,000 since 1993.

Now these numbers are just based on FTEs of personnel and the reduction that we saw. There are other benefits that are not terribly quantifiable, like the efficiency of the doctor or the staff in terms of having the data immediately and not waiting on charts or not looking for charts. Reminders for services and visits; that increased revenue. What I'm speaking about is good revenue. What I mean is we're doing things that we should be doing for the patients and we're reminded of it by the system. We have embedded clinical pathways within the templates. That also means better patient care, but also means higher reimbursement for our practice.

The templates in our system reduces transcription costs. It gets information into the system in a more timely fashion. Also the templates allow for delegating information gathering to specially trained nurses, which in my case is quite beneficial to me.

There are some non-financial benefits. We have patient satisfaction levels higher than on a paper record system. We can do electronic searches for clinically relevant data, checking on blood pressures, checking on who's on Vioxx and things of that nature and able to handle those types of issues in a very

inexpensive and efficient manner.

Quality improvement. The program has drug interaction and allergy checking. The program prints prescriptions to eliminate handwriting errors at the pharmacy. Problem and medication lists are 100 percent accurate to reduce mistakes due to oversight of important information. The program prompts doctors and nurses whenever health maintenance services are past due. It prompts them also for chronic disease management services and identifies the parameters that are not met. What I mean by that is, someone comes in for an ear infection, the program will tell me, this person is a diabetic and didn't get their blood test two months ago like they were supposed to. Or they did get their blood test and the test is not optimal. So it reminds us, even in the face of an acute-care visit that chronic disease needs to be addressed as well.

Laboratory results flow automatically to letters that are then sent to the patients. They tend to like that. And as is obvious, the information is available outside the office, when you're on the phone on call, either at home or at the hospital.

So the electronic record is a very basic tool for comprehensive, outcomes-based management of patient care. That's a lot more than just the day-to-day what you do with the patient when they're in the office. You can efficiently monitor and manage care for all patients and focus on specific disease processes.

The future. Our program is set up so that it is Web enabled and it will allow patients to view whatever results we'd like to present to them; laboratory results, major problem lists, current medications, appointment requests, patient education. Those are some of the things that we're thinking of doing though we haven't done that yet.

Also into the future, consultants will be able to gain access to the entire patient chart, which I think will be tremendously valuable. It's very difficult to keep on sending copies of this and that to each other and remembering how many consultants may potentially be involved. This way you give them access to the data and they look things up as they need to. As you can imagine it's more timely as well. So a test that was done this morning, the result that came in at 11:00 a.m. should be there, not only in the primary care doctor's office but also the consultant's office if they need it.

Outcomes-based reimbursement. We think we're doing a better job in terms of quality outcomes than most other offices in our area and we're working to take advantage of that. In our area we have an IPA that seems to be very cooperative and a local HMO that seems to be very cooperative, optimizing quality.

We're actually receiving payments for optimal patient outcomes for various and sundry diseases like diabetes and depression, things of that nature. We are receiving payment for working on patient care management that results in fewer admissions to the hospital, shorter length of stay. These are all good things for the managed-care organization but it's also

good things for the patient. Avoiding unnecessary hospitalizations helps everybody. actually, including the doctors. It's a lot more work to take care of patients in the hospital, I think, than in a doctor's office.

Our IPA has control of the withholds and incentive money from our local HMO and they're returning these dollars back to the physicians based solely on outcomes, both financial outcomes and quality outcomes. And $8 million divided among 300 physicians is a pretty hefty incentive. That's $8 million assuming we have a good year, which we don't always have. But I would say on the average we're talking about $5 million a year that gets divided in that manner.

Clinical data repository. We are working on a community basis to try to develop a health information network and a data repository. Our own program has about 50,000 patients in it right now and our community has a population of about 130,000. So as you can see that's potentially doable, especially with the money that our group has invested in connectivity, to simply expand that capability to the whole community. There are all sorts of financial and political issues that have to be addressed though.

The Renaissance program. Just a brief mention of that. We're embarking on an ambulatory care redesign program similar to what the Institute of Healthcare Improvement is working on. You really just can't do that without it any more. The HMOs talk about, if we were successful in improving our benefits, to consider adjustments in copays and premiums and things of that nature from there in to promote this type of effort.

So in conclusion, we're one of the more productive family practice groups in our area. We have one of the lowest staff to provider ratios. We have one of the lowest cost for patient care based upon the managed-care data in our community. Our five providers are near the very top of the outcomes data for diabetes, for example. And we have a one of the highest take-home salaries -- I don't know that for sure -- in our area.

So in conclusion, the EMR has improved the quality of patient care for our patients, has reduced our overhead expenses directly. It has enhanced our revenue and has really helped us to be prepared for health care in the 21st century.

The question that was asked us is, would it be easy for others to duplicate our efforts? I would say that we've done a lot that other practices may have some concerns about doing. First of all, it's the cost of implementing an EMR system. $125,000 doesn't sound too bad but as we expanded to three offices we've spent over $1 million now on information technology in a family practice setting, which is a moderate amount of money. Large organizations may be able to better afford these types of investments.

The complexity of doing this is not too easy for a smaller office. The reason I emphasize a smaller office is I believe in Colorado the average office has about 2.5, 2.7 doctors. So we don't have large quantities of large organizations of physicians,

so you're talking about two, three, four doctor offices that would have to undergo these changes. The hassle factor for physicians undergoing this type of change is difficult. And lastly, I think the EMR benefits patients but it also mostly benefits the payers. But there is no increased reimbursement for physicians, which does not provide a lot of incentives for physicians to spend that kind of money to help everyone else and essentially hurt themselves.

Our group of five has done well with this conversion but our larger group is financially negatively impacted with the expansion. So that $1 million actually ended up hurting our larger group, and other than saying we have an EMR there is actually not much in the way of increased reimbursement for these efforts.

So you get what you provide incentives for, so I suggest that comprehensive care is better than just quick and simple visits. Population-based chronic disease management is better than an acute-care approach even to chronic diseases. That always having patient's medical data available is better than information available only in the office. And electronic drug and allergy checking is better than trying to remember thousands of interactions. I think with IT in a primary care office I think you're going to get a lot more of the first rather than the second.

So that's it.

MR. HACKBARTH: Thanks, Gregg. Why don't we go through all of the presentations and then have discussion?

DR. WALKER: I'm going to go ahead and move on then, talking about what our goals were originally for the EHR and some of the barriers that we have had to overcome to achieve it, some of the results we've documented and take-home lessons about how other groups would use what we've learned and generalize it.

The fundamental reason that we embarked on an EHR, in 1993 was when the planning began, is because we cover 31 counties in rural Pennsylvania; 23 are officially underserved, 30 are rural. Without electronic communications and an electronic health record we didn't think we could function as a system as opposed to just a collection of practices.

So stakeholder communication, and originally that meant clinician communication and more recently that's meant both patient communication and communication with physicians external to our system, was really the primary driver. Quality and safety were critical. The team that made this decision back then felt that going forward we wouldn't be able to provide quality medicine, quality care without an electronic health record.

Process efficiency is something that wasn't mentioned at the beginning, but we're getting clear on as time goes on and focusing more on. And delighting the customers was always part of the intention, although delighting internal customers like nurses and doctors is something we also are getting better at as we go.

Just very quickly, we're in 31 counties. We have 42

clinical sites, two hospitals, 600 physicians. The outpatient EHR is in use by all physicians and nurses and office staffs. All orders are entered in it. About 80 percent of notes produced in visits are produced electronically originally. The others are transcribed into the system and signed in the system. Radiology images are available throughout the system. And by the way, throughout in all of this means at home and other hospitals. We do about 80 percent of our radiology images electronically now. Mammography is the real exception.

We're going to be doing inpatient order entry and documentation in 2005. The patient electronic health record. which I'll talk a little bit more about, has 15,000 users currently and is available in all of our practice sites, all of our specialties; any patient that has a Geisinger physician.

Outreach EHR. we currently provide different kinds of information to external physicians so that a physician that is involved in the care of a patient receives hospitalization information automatically. That's pushed to a HIPAA compliant we site that any physician in the region can have an IDM password to access that information. If the patient signs a HIPAA compliant authorization then any physician in our region can have complete access to that patient's electronic health record.

We just have received and AHRQ grant to support planning for a regional health information network, which again will be open to any health care professional in the region; originally hospitals and practices.

I wanted to talk some about barriers. As you may have gathered for Dr. Omura's presentation, I think the critical barrier is lack of organizational ability and will to transform itself. I think an organization like Dr. Omura's practice that sees the EHR as one of the important tools that can be used to transform the way an organization improves from 55 percent performance on validated health interventions to 100 percent, that does that in a way that makes maximal use and maximally empowers patients, and minimal requirements for human resource use, will succeed. If that is absent, it doesn't really matter what else is present, an organization is not likely to succeed. The problem with that is that's a deep problem if an organization doesn't have those two things. There is no quick fix for that at all.

Elusive benefits. Your white paper talks about that some. Obviously there is suggestive evidence, and I'll present a little bit, that EHR really does have the potential to improve quality and safety and efficiency simultaneously. But that has not been demonstrated in anything like a credible ROI study. It hasn't been demonstrated in real production systems involving lots of physicians whose job is just taking care of patients. So that is a problem that some effective research would help with.

Cognitive load is something that I think is talked about too little. This is really difficult and goes back to the first issue. Physicians, like other professionals, are able to work fast and with remarkably low error rates, despite all of the

errors we do make, because they have semi-conscious intellectual routines that they run through over and over again that work extremely well most of the time. Nurses the same way. When you use an EHR you have to retool your brain. It's like working in a second language for several months. We've worked on some ways to diminish that cognitive load, but it is real, whatever you do, and is one of the fundamental reasons physicians are reluctant about all of this.

Immature software. We use what is, without any serious question, the best commercial software there is. We have one of the deepest and most successful implementations of it, and we still bang up against the limitation of the software constantly. So that while there are lots of things that are more important than the software, it is still true that while the software will support a very effective implementation, it still needs a lot of work and it's one of the things that makes implementation a real trick.

I want to add one other thing in there. Because of the cognitive load, because of the immature software, there is the risk for adverse effects. There is some research on that but not nearly enough. With any intervention in health care what we want to know is what the benefits are and what the adverse effects are that we should be watching for, and know how we're going to do deal with them when we find them. We don't know enough about that.

One of the really important ones for us is mistaking go-live for the finish line. People, we included, are prone to think of EHRs as sort of like plumbing. You put the pipes in and if they don't leak you're finished. It's the opposite of that. What happens when you put in an EHR is everybody changes the way they work. It's inevitable. People who never thought about process before start to see the power of good processes to improve care, to make things more efficient, and start raising questions, start coming up with ideas for changing processes further.

EHR is very hard to learn and what you hope users learn by go-live is enough to get through their day and take care of patients effectively. But to become effective users, to really achieve the benefits that are possible in terms of quality and efficiency requires ongoing, intensive training, ongoing adaptation of the system. That's going to go for years, for 10 years at least we'll be hard at that.

One last limitation that I didn't put in your slides, because our project manager met the need so effectively that I forget to think of it as a limitation, there are not enough skilled implementers. If you could give everyone in the United States enough money to implement an EHR, there would not be enough people who can go into a clinic, help them assess their work flows, assess their needs, design the configurable parts of the EHR to fit those work flows so that they can be genuinely effective. So one of the things we're going to have to address really is efficient ways to maximize the benefits of the people that do know how to do that. Workforce approaches are going to

be slow enough that they won't get us where we want to go nearly quickly enough.

I'll just talk briefly about the independent physicians. We provide them hospitalization information, EHR access, as I mentioned. One of the other very powerful things about the EHR that actually our team designed and then the vendor has built into the product is that when I create a note electronically I can pull up a form and automatically have the primary care physician and the referring physician who sent that patient to me, but then I can pattern match it by typing the first three or four letters of a name. I can pattern match any physician in the region and send my note automatically. Hit submit, and tonight at midnight the system goes through and knows which of those physicians want e-mail, which ones want fax, which ones want U.S. mail, and automatically distribute my note to all of those people in whatever format they prefer. We're doing about 20,000 a month now, that external automatic note distribution.

E-curbside consults we're just starting to do. There's good data in the literature that you can do this in a way that is effective for the referring physician and the receiving physician. We're just starting to provide that kind of service to external physicians.

The patient EHR, this is one of the places the software really is critical. The way the software we use is designed, the patient EHR is just another few into the EHR. It's like the nursing view, or the physician view, or the outpatient view, or the inpatient view. So it's designed into the system. It requires very little resource and very little high skill resource to implement. It provides the patient the view of the same problem list that I see, the same allergy and medicine list that I see, the health care histories, lab results, about 95 percent now of lab results are available in the system.

They can renew their drugs. All you do this click beside the medicines that you're running out of, hit the submit button. That's submitted electronically to your office. Then you get a message back when that's been transmitted to the pharmacy. So no more calling the office and being on hold 10 minutes, and then going to the pharmacy and finding out it didn't get there, and then calling the office again the next day and being on hold 10 minutes and finally getting it done.

You can request appointments and referrals, and you can ask your doctor a question. Or from my standpoint I can say to a patient, why don't you check your blood pressure a couple times next week and we'll see if we got the lisinopril right? So the patient can send me that electronically and I can reply to them very easily. Of course, part of the beauty is that is all captured in the record then, so there's no question about what was said and what was asked.

The patient EHR - this is the killer app, if it matters. This is the thing that for patients will make a visible difference in their care. Patients love it. Children of patients love it. Sixty-year-old children of 85-year-old

patients are delirious because for the first time they can help their parents keep track of their medicines, their appointments. They can also communicate -- we had one child of a patient that came for four hours to a feedback group. She said, this is great. When my father started to have some symptoms, I was able to send a message to the doctor and they got him into the emergency room and got a pneumonia early before it made him really sick.

Parents love it because they can print their children's immunization records without schlepping into the office.

Physicians, being good skeptics, are suspicious of it at first. The more physicians use it, the more they like it. The big question is, what about my problem patients that need to talk to me three times the day? What we're finding out is that those patients are actually much easier to take care using this. Maybe they feel like they have easier access, but it actually works better.

Talk just quickly about some of the benefits we've realized. Patient satisfaction. This is a poll of 17,000 patients in our community practice, family practice waiting rooms. 94 percent said that they found having a computer in the exam room either good or very good; helpful or very helpful.

Productivity, this is a complicated slide and we can come back to it if it matters. What it shows is that in almost all of our specialty clinics the productivity of the physicians, the quarter that went live is as good as or often better than it was the quarter previously, and then those trends are prone to go up afterwards.

Referral reports I told you about; the automatic transmission of reports to external physicians. In 2000, 2001 we saved about $1,000 per physician per year on improved formulary compliance. We've seen dramatic reductions in transcription. In dermatology they're reduced transcription about 90 percent within a month. I must say there are other departments who have increased their transcription 40 percent, so this remains a management issue as well as a technology issue.

We have decreased chart pulls from 1 million to 400,000 a year. Fairly conservatively that's $1.8 million savings a year. We are printing about 372,000 less print jobs annually. Paper is cheap, but the cost of filing those is easily $3 per filing.

Performance reporting. We can produce more reports now than we can act on. So we can record by service line, by clinic, by physician what the average hemoglobin A1C is, what the average LDL is, how well we're doing on mammograms and pneumovaxes.

Take-home lessons. We are where we are because of a remarkable combination of will and ability to change. Visionary and determined leadership by the CEO and the chief medical officer, support all the way through the organization, a whole set of issues, but particularly that change of seeing the EHR as a change tool.

Benefits need to be clarified. It clearly would help if it were easier to make the business case. We did it because we

thought it was the right thing to do and we thought we could afford it if we were very smart and worked very hard. That isn't a recipe for widespread industry adoption obviously.

For what it's worth, we think it would make more sense to pay for performance that isn't possible without an EHR than it does to pay people for having an EHR. Having an EHR is neither here nor there. What the issue is, can we improve 55 percent to, our goal is 100 percent. We don't think people are going to accept anything less than 100 percent. We either did it, we documented why there was a reason not to do it, or we documented that the patient didn't want it after good education.

Decrease in the cognitive load. There's a lot of ways to do that and some could actually have policy implications. What we have done to do that is provide users the high benefit, low learning cost modalities first, so that -- lab results. That just makes something that every doctor does all the time a lot easier and a lot more complete than it used to be. Providing radiology images everywhere actually pays for itself within two years fortunately, but is also a huge winner for physicians. A hospital physician on a good day spends an hour looking for the films that they need to do the bronchoscopy or to diagnose the patient or whatever it is.

Electronic communications. In our health network we think one of the first things practices are going to need is secure e-messaging capability, which sounds silly but a lot of physicians don't have easy access to that very simple kind of thing. We think e-curbside consults are already a way physicians work, and particularly in our setting where we have rural physicians who can be very isolated, we think that will be one of the things that will get people starting to use electronic systems.

Speed software maturation. That's a hard one. I'm not going to say too much about that.

Leverage skilled implementers. As I said, there's a severe shortage and it's going to be around for at least five years. One of the things that we're trying to figure out and need help with is how to take -- to understand this, we have about 80 people on the implementation team. The first year we probably did four practices. The last year of the outpatient implementation we did 43 different specialties in one year. That's with full needs assessment, work flow analysis, customization of all of the preference lists and diagnosis lists and order sets and note templates.

So one of the things that happens is you get very good at this over time, if you get a large enough organization that you have that kind of learning opportunity. Just when you get -- it's like doing your own kitchen cabinets, just when you get good at it, you're done. So clearly we need to figure out ways to keep that from happening.

Just a couple of other things that really are things that you can do that would be hard for anybody else to do is standard performance standards. We assume that the RAND 439 interventions are performance standards. We assume that the CMS 138 are

performance standards. We assume that the NCQA 56 are performance standards. But we need those prioritized. Instead of us and Kaiser and Cleveland and everybody else trying to guess which ones are first -- I mean, the first six are pretty obvious. But after that it would be very useful to know that these are the ones we're responsible for in 2005, and these are the ones in 2006, and these are the ones in 2007.

Fitting with that, it would be very useful if we had a single reporting dataset that we were responsible for, so that all of the registries, and disease registries, and JCAHO, and state bodies, and federal bodies all agreed together that if you provide this dataset, you have met your data reporting requirement and you will qualify for all of the pay-for-performance opportunities there are and all of the other reporting responsibilities you have.

We obviously, first of all, could cooperate with each other and build that at the vendor level, which would be enormously effective. Epic will have 42 million Americans with an Epic electronic record within a year and-a-half. If we could create that single dataset, then providing the information that all of those bodies need to do their work would become a very efficient activity. Also you wouldn't have very much trouble persuading us what needed to be done.

Clem is the data standards master so I'm not going to bother with that.

Here's the book we're publishing next month on how to do some of this a little more efficiently.

DR. McDONALD: Thank you. I'd just like to applaud all the things I've heard so far today, and especially remember that, just like drugs, we should not be so naive that we shouldn't expect bad things to happen. Vioxx shouldn't have been a surprise. It happens every few years and it's going to happen in to have advised said that the that's a prospective or to use of adaptive and health care information systems too. We're going to do bad things. It's going to cause harm as well as good. Nothing is perfect.

But I guess I'm the skeptic. I've been doing this for 34 years, and it's a good thing and it's a lot of fun but we have to stay scientifically honest about what the likely problems are.

There's two approaches in the administration's and Washington's mind. There's one approach in Washington's mind now, is how to you get electronic records into offices. Plan one is to put a little EMR in every office practice. But I think there's a misconception. People think about electronic medical records as being things that have data in them, because when you go to a show they always have data in them. But they're just empty boxes and all the work is putting the data into them. It requires hand entry to backload at least some data to get the things started. It requires hand entry of most ongoing data. In some cases physicians or a clerk. I'd point out that most pharmacy systems hire pharmacy techs to put in the prescription because they can't afford to have pharmacists put them. Just a

side issue.

There's the rare automatic import of outside data. Sometimes lab data, but it's a tough struggle for little offices to get that, and lots of operational overhead for a practice. They don't know how to do backups. They don't know how to buy tapes. I'm talking about the one and two-man practice. There's no automatic entry of outside information, and there's computer warfare between payers and providers. I have some practice people who love their computer system because they've been able to upcode - they really get the right codes they should have got.

[Laughter.]

DR. McDONALD: But then what happens is, inevitably Medicare will come back and get a better offense and squish it down. We're not going to have any net value for all this work and this computer investment if we focus on those issues.

Now some of the outside information physicians need -- there's lot of it -- outside consultant notes. We heard about EKGs, operative notes, discharge summaries, radiology reports. It goes on and on, spirometries, EEGs, EMGs. So the second plan is build a highway and focus on the outside information at least as much as the inside information. Build the infrastructure to standardize and move clinical information from where it is to where it's needed. Then it's possible to efficiently provide all the EMR services. You actually do it as a remote service. I think that eventually will be the cheap way to do it when the industry finds it way. You could deliver standardized messages to larger practices. The little ones could just use the central thing.

So it's more important to build a highway then the hotel or the fast food place. So the local health information infrastructure is the highway. It connects the health care players. It delivers clinical data in a standardized form to the users. It provides the guardrails and protections for the data riding on the highway.

The office is the hotel along the road, the office EMR. It's the one that's receiving it. It accepts the clinical data from the feeds, provides special local services and in fact the central system could provide many EMR services. The highway always comes first in real life. You don't build hotels and fast food chains and hope that highways will line up along them. You have to go the other way around. So I want to put some strong thought in the process. Just supporting EMRs in the office is only half the problem or less than half the problem maybe.

Now we built one of these things and we call it the INPC, the Indianapolis Network for Primary Care. I should say I'm from the Regenstrief Institute and Sam Regenstrief invented the low-priced dishwasher in the little town of Indianapolis, made 40 percent of the world's dishwashers at one time. Just a little promotion for Sam who's since passed away.

But our thing began, one project providing data for all hospitals in the emergency care. We extended it by adding public health, other practice physician access message, and research one

step at a time. I think the gradualism is the only way you can do this. Big bangs are explosions. Everything blows up. Now focused on the clinical public health and research uses has been done so far. the patient use is actually very ripe. There's big challenges in a big community; who gets access and how, and how do you stay out of trouble.

So what is it? INPC, it's a central community clinical repository. Be careful about the word EMR because blends all over like the word love. You never really know quite what they're talking about. A repository people know what it is. It's the physical record of the data.

There's also a secure network for moving the data around. There's tools and processes for standardizing the data and using it for various purposes. These standardizations happen centrally and there's formal agreements among all the participants. This is like a 40-page document and I can't get into it, but it's important that everybody knows the rules of the game and you get them to agree to it.

Why we did it was for clinical care principally. That's what motivated it; fast clinician access to the complete picture. Now you can drive a car a lot better when you can see out of the windshield. We're trying to give a clear windshield to the providers. Preventive care is something for the future, and low-cost EMR in the long run we think we can do too. We're not doing that.

Why we did it more, we have a big interest in research and you get population-based data. Now you can start doing things. Long term benefit and new technology, toxic effects of treatments, biologic discovery, because you can get the specimens. That's a side issue. Facilitate clinical trials in the future. I think that's doable. There's a lot of barriers political and social. Public health, automatic case finding; we do that now.

So all these flows come into the central system, the computer looks for those reports of laboratory tests to say, this guy has got anthrax. We haven't found one yet, but we do find Schigella and some of these important diseases. Biosurveillance for bioterrorism we're doing too. And who contributes? Now it's just the hospitals or principally the hospitals. Five major Indianapolis hospitals, that's what we've, so that's good. Fourteen hospitals, they provide about 95 percent of the hospital and emergency room care. There's three hospital-associated large group practices, four homeless clinics and the public health department both in our county and in the state. We have immunization records coming from them. We take in public health department lab results. We take in their tumor registry for research purposes.

So all hospitals contribute. They commit to contributing discharge summaries, operative notes, radiology reports, pathology reports, cardiology reports like EKGs and cardiac echoes, tumor registry data, and two-fifths of them provide a lot more. They give us everything they have. Public health

contributes data also, and this is much but it's not everything. There's more work to be done.

Just to give you an idea, we have HL7 message streams. We have 84 messages coming in. Realize that hospitals are not monolithic. You go almost invariably to these various systems within the hospitals to get the messages. We have 52 million HL7 messages per year. We have 660 million rows of discrete observations. We have 45 million radiology images. That's only from two hospitals, and we're getting 81 million new observations per year. We think if we get the whole city we're probably at 400 to 600 million observations per year.

Now the limits. We don't have everything. Most of it comes from the hospitals. We only have 20 percent of the city's medication information. Much of content is text, which you can't do as much automatic with. But text searching tools do give you some power. And we have data from only a few large practices so far.

There are broad capabilities from this information infrastructure for clinical care. There's large possibilities for research and there's these public health opportunities. Our storage strategy, we keep each institution's data segregated in this common database. It's a replicated database. This is how it looks from the web. Now we have a system that sends reports out to doctors' offices. That's what a report would look like.

The public health goals are to link the clinical activities and the public health activities to improve the population health, and I already mentioned how we do that. We use the repository for medical record for a lot of research purposes and there's lot of opportunities. We want to maximize the research that can be done on de-identified data through many mechanisms.

We have links to archive tissues. It turns out everybody who has a pathology specimen report, the specimen is kept for 10 years, and those are accessible in principle by finding cases and getting to the pathology report and then you can get to where they are stored.

We have links to other data sources. We have the Social Security death tapes so we can tell who died. We have tumor registries. We have hopes of getting Medicare data and Medicaid data, and there are many local institutional long-term research databases.

Problems encountered. We really haven't encountered tons of problem, but we had no deadline. So what one guy's problem, maybe he's not getting it done yet. That's not a problem to us. We just took our time.

Secondly, we have a small number of health systems relatively in our city; five with 14 hospitals and that makes it a little bit easier. Until fairly recently it was a congenial group. But as competition heats up there may be additional friction and difficulties. There's a cadre of medical informatics researchers who live there and we are far from done.

Now there are many advantages that can still accrue. The framework is right. The HL7 message standards are in place.

People complain about them, but so you take a week to fix them, but you get them from. And you can get them from almost all these systems. The need for information is great so I think it will really happen. But I think I'd advise that we shouldn't rush it. You ought to at least have two or three of them running before you insist everybody have them. There's this great tendency, when it's hard to do it on a little scale, let's do it everywhere. I was at an AMA meeting one time and they said, it's just about impossible to automate a hospital's information system, and then the same guy says, so what we'll do is the country.

So physician order entry, just a caution. There's a paper you might have gotten and just be careful about it. There's very little experience with non-full-time MDs, whether it's in an office practice where they're just there all the time. Most prescribing safety benefits can be obtained through other mechanisms. If you're talking about drug interactions, the pharmacy systems can check that. Handwriting has not been a safety problem in any formal study. If there's anecdotes about it. The problem of handwriting, it makes pharmacists call back on 30 percent of the prescriptions. So it's an economic problem.

Other routes exist for delivering decision support. We'll be publishing a study in a couple weeks using nurse standing orders; very powerful, and it's easier on everybody. And computer systems cause their own errors. There was a report last year, the pharmacy industry says that 8 percent of the input goes in wrong in computer pharmacies. We're not measuring that side. We should be looking for that's so we can fix it, because we can make it perfect. But it's probably not going to be perfect going out.

I've heard a couple of bad stories where the error rates are just to the sky because you go down one line and you're picking the wrong -- it's a perfect looking order. It's the wrong patient. You just got off by one on the mouse. So we don't want to do a Vioxx on this stuff, so be careful.

E-prescribing. You've got a lot of great potential but they aren't helping the physician much with this. It's going to help the pharmacies tremendously. Pharmacies collectively know all the medications they get, and the physicians would love to know that. So they have to first type in all the prescriptions they think the patient is on, and they would love to know what else the patient it getting, because those are the things that really cause harm. That's not being designed into this. There's no mechanisms currently to make them connect across.

There's no standard link -- this other problem is these special formularies that everybody has got. You've got to go, here's the drug, you give it to the patient. Oh, it's going to cost $50. They call back. It's a mess, and you cannot figure it out. It's impossible. You get these books and these little -- every week you get another one and it's all paper. There are a couple companies now that have them electronically but there's

not a standard link between the plan and the formulary, so you can't automate this yet. It's just for want of a nail, we could almost do this.

What CMS can do. Two things to think about. Make Medicare data available to EMRs. Use it as the feed to EMRs. It's administrative data. People complain. But it tells you the procedures done. There's a lot of history in there. So think about that. Also for clinical and value research purposes.

Don't balkanize the prescription data and the Part D. I'm hearing rumors that's what's going to happen, that it's going to stay back in these various places. It's not going to come to a central place. We're done with people over 65. We've got all the data we need. We've got half of it if we just had the Medicare data plus the prescription data. And allow combines of Medicare and Medicaid for research. We have a very advanced thinking Medicaid organization in Indiana and they're now terrified that they're not going to get the prescription data they're now using for managing cost because of the dual cover because of the new plans with Medicare.

I think that's all. Thank you.

MR. HACKBARTH: Excellent. Very helpful, thought provoking. Some questions or comments from commissioners? If not, I have a couple.

The way we've been thinking about this issue to this point, the framework if you will, is a few basics or crude categories. One is development of standards so that as systems do develop there is the capability to share information across delivery organizations.

A second category, for lack of a better term, is market development. We've heard a lot about how difficult it is to navigate this marketplace if you are a provider considering making the investment in clinical IT.

Then the third is economic incentives of various types, ranging on the one end from capital assistance, loans, grants, to various types of pay-for-performance, the most basic form being paying for clinical outcomes, good results as Dr. Walker was talking about. But also there have been proposals or ideas presented about, short of that, paying for capabilities, the development of the capability, per se. This is where I want to ask Dr. Walker a question.

You were quite explicit in saying, just having a system is not what we're after. What we're after is the good result, and that requires not just information but acting on the information to produce better results for patients, which makes eminent good sense.

On the other hand, one the problems that we face as we look at the pay-for-performance area is that our ability to develop and operationalize new measures of performance is at least in part dependent on the availability of information, particularly information at a reasonable cost. So there's a bit of circularity here, and I think that's part of the appeal of not just depending on paying for performance as the way to drive the

development of clinical IT. I'd welcome your reaction to that or the other panelists as well.

DR. WALKER: My concern is that developing a system that helps us to deliver flawless performance and then report it efficiently is complex. It seems to me that if we were responsible for getting DVT prophylaxis done on all patients that needed it, and someone like you, someone needs to help with some kind of consumer reports function so that people that don't have expert knowledge, which is practically all of us, would be able to look at systems and see a rating, how well they do with helping you that effective reminders to do pneumovaxes, and how good is their reporting module? Does it come with the standard report? That would be one of the points of having a single standard dataset. Does this system automatically produce that standard dataset for you?

It seems to me we'll be a lot better off if what we have is health care organizations who know what the requirements are and who get help buying a product that can help them do that than if we try to define a product, because then you get into all sorts of gaming basically. You'll be in the situation of now we've got an EHR but we have to prove to you that it's a good enough EHR, and it has these 44 criteria. It seems to me that we will get into a regulatory and definitional quagmire.

Whereas if you say, there's 439 RAND and so forth and you're responsible to get this many of them done and we'll just pay you for every one of these you accomplish, then organizations will have powerful incentives. As long as they have clear help making a choice I think it will work better.

DR. McDONALD: I think the situation and the case is quite different for large organizations and small offices. Large organizations are going as fast as they can, best I can tell. So you're going to have it whether you pay for it or not. I don't want to take any money away from large organizations, but they have enough critical mass that they can actually do it and have enough information that it's worth making this big critter.

I want to come back to the smaller organizations. The problem is they're talking to each other a lot. It's like telephones, unless everybody has one, it's not much good. I think also there's this current effort to define the functional EHR, which I think is goofy. There's never been a technical standard ever done that way. You'll be getting into all kinds of quagmire; I got it, you don't have it or something like that.

But I think what you could do is you could count data that they've gotten electronically and is available electronically, which would be the infrastructure for it. So if they're using an outside lab, you incent both of them. Because the labs do weird things and make it hard to capture that data. If they just had a little incentive, that they don't get that extra increment unless they send it in a way a guy could catch it. So you can't have one hand clapping.

We've got to keep thinking of where this comes from, and keep thinking about the road between them while we do it. I

think if you want to get the clinical data in the small offices you've got to incent the people who send it so that they have to send it in a way the guy can catch it and put it in his system. Then you can incent the guy that catches it too. But he can't catch it if they don't send it to him well, no matter how hard he tries.

MR. MULLER: I'd like to thank you. Those are fascinating and certainly among the fastest presentations we've ever heard. Just trying to take it all in, I was reeling, in terms of what Dr. Omura said in terms of the small group, and then what Dr. Walker talked about, a larger group, and then what Dr. McDonald talked about, about a regional group.

Give us a little sense of the public good to Medicare. Obviously, as you said, a lot of the larger groups may be doing this out of their own self-interest. What's the good we get by having regional solutions versus provider-specific investments and solutions such as this? We can all infer from what you said in western Colorado with your small primary care group and then obviously at Geisinger, but what level of add-on or benefit do we get by having solutions that go beyond the specific providers, these regional cooperative efforts?

DR. McDONALD: We have this mythical thing where we exist in our office all by ourselves. His 5/30 practice, that's not so small anymore. The one and two-office practice, half their information is coming from somewhere else. They're getting it from the consultant, they're getting it from the hospital, they're getting it from the nursing home and it's a mess as it comes in; envelopes and you have to unfold it. So the regional thing isn't a competitor for the one in the office, but it's just a way to consciously face up to the fact, this is a connectionist world in small offices. A big organization still has stuff come in, but they have an awful lot they make themselves.

DR. WALKER: One of the real challenges, one of the places that patients suffer the most is the interface between outpatient and inpatient. So the patient comes to the hospital, you have a medicine list but it's not clear to you as you're admitting the patient what all those medicines are for. It may not be exactly the right medicine for heart failure but it may be particularly appropriate because the patient couldn't tolerate the right medicine.

Then when the patient is discharged you've almost always stopped some of the medicines they were on when they came in, started new ones, and then often you just forget to stop things that you should, like the stomach protector that you gave just in case. So the patient comes back to the outpatient doctor on this stomach protector that actually has no reason and as a doctor I say, I can't get anything out of you in terms of a history or there's nothing I can tell that this is four, but I'm really scared to stop it. And I can't tell why you messed up my heart failure regimen that I spent eight months putting together.

So part of the regionalization is that we would make it easy for outpatient doctors to see the hospital record, for hospital

admitting doctors to see the outpatient record, so that we decrease both the inefficiencies but also the real patient suffering that goes on because of those disjunctures.

DR. OMURA: I think we definitely have to go beyond the office-based medical records system and my feeling is it needs to be the community. In our location we're talking about the entire community. In a huge city you'd have to define the community in a different way. But there's a lot of interaction that goes on between patients, consultants, and hospital that you would do well to try to coordinate in a system.

MR. MULLER: Let me follow up on that. I can certainly see the advantage of getting the information about patients from all possible sources, whether it's inpatient, outpatient, pharmaceutical and so forth. Both Dr. Walker and Dr. Omura talked about the necessity of having the right culture and organizational commitment to get these things done. They don't just happen randomly. You have people who are really driving it.

Therefore getting this time, and whether it's a smaller primary care group or a larger system, I can see is reasonably hard to do. So when you start thinking about doing it in a bigger geography where you have five systems, I could see it gets more complex. So what I'm really asking is, is the desire to get the whole system, say in Indianapolis, working together and, obviously, you've been working at this for 34 years and you're legend around the country, but does it become so much harder to do if we start asking people beyond an organizational grouping such as Geisinger and your primary care group?

DR. McDONALD: We're talking about different tasks. The real hard one almost invariably involves data input by people who haven't been data inputters. That is where you're really retreading the whole process of an organization. a get interested in right-of-way you're physician order entry, putting notes in a chart. The regional is not talking that. We're just saying, if you get a note -- dictation is the common way -- you send it. That's not hard. There's political and there's glitchy things in it, but it really isn't hard.

So the repository is way easier than the order entry side of it and the note entry side of it. When we're talking about the regional we're talking principally about repository functions. Delivering the information that's sitting in somebody's computer in a form that can be organized in somebody else's computer or on the screen.

MR. BERTKO: I'd just like to change the topic slightly and connect maybe two dots here in the context of whether MedPAC makes comments on EMRs. Part D data is coming up 1/1/06. CMS has asked in the draft regs what people think about having either a single repository for Part D data -- that is, one entity or some jointly-owned or contracted entity or individuals -- and perhaps the panel would like to comment. I've had my own impressions of what would work best, but there needs in this case to be some real or near realtime exchange of data for people who change health plans and perhaps it would be also helpful for

these purposes.

MR. HACKBARTH: I think we know where Dr. McDonald stands on that.

DR. McDONALD: If you don't have it as central we're screwed. You may just start out having it centralized and using it for outcomes research or for the kinds of things CMS now uses its big database for. But there's opportunity to very inexpensively deliver and be a fulcrum for the repository functions in communities or whatever else. Because the hard part is getting it in. You've got the stuff. It's just sitting there, so take advantage of it. The cost of data, the more ways you use it, the cheaper the entry -- you distribute the costs across that entry. Then also be careful about how you store it so you have some way to hierarchicize the drugs. But that's easier.

DR. WALKER: I certainly agree.

DR. MILSTEIN: It's taken a long time to get part way in Indianapolis to connectivity among all elements of the delivery system. Beyond Medicare through its databases, being a fulcrum for exchange, is there anything else that CMS might do to speed this up? Because if we take -- how many years did you say it's been since you started in Indianapolis?

DR. McDONALD: We didn't start the citywide thing back then. We wasted a lot of time writing our own database system and other things.

DR. MILSTEIN: How long have you been exchanging data in Indianapolis?

DR. McDONALD: For all three hospitals, since 1997.

DR. MILSTEIN: So in Indianapolis we're seven years into it and we have X percent of the data being exchanged. On a national basis, given the enormous value of having the highway built, what might CMS do over and above making its data available, such that the highway system is built out rapidly rather than wait for every single community to go through the same learning curve and delays that the pioneers inevitably ran into?

DR. WALKER: One of the critical ones, one of the things that we anticipate in our regional network that will take the most work and be the hardest is just getting laboratory results rationalized and communicable. If laboratories did have incentives, requirements, whatever, to transmit those signals in standard ways then the work that we will put into doing our system would be probably 60 percent less than it will be. So that's a very important way.

What Clem says is right, what doctors really need is lab, rad, and pharm. If you give doctors laboratory information, drug information and radiology information, they can pretty much make up the rest. You've got 80 percent of the benefit. That's the way we're going to build our network, is put in the things that are the easiest. We're already providing remote radiology all across our region. Put in those things that are easy for doctors because they have obvious value. They're used to using the information. This just makes it available and available easily.

That's certainly the way we're going and the biggest thing that would help us.

DR. McDONALD: This is like manna from heaven, the opportunity to say this. Laboratory integration is probably 10 times harder than radiology or notes or anything else because there's 3,000 to 5,000 different tests, plus codes underneath it. There is not built into the culture the idea they have to do anything else but get a report that someone can read out. Whether the units change on that test tomorrow or not doesn't make a whit of difference.

There's about 10 things you could do which wouldn't be that hard. You put the units in the units field. You use units and you don't change them without changing the codes, if it's a real meaningful thing. You don't just takes globs of text and jam it into the field. You could do five requirements and if you gave them another 2 percent when they shipped out electronically the practice systems could pull this in, or a central repository. You come out a lot of different ways. The hardest thing is they're not in the game. We're talking the guys that receive it, not the guys that send it.

DR. MILSTEIN: My next question is really specific for Dr. Omura. You're just below the cutpoint where current estimates suggest that it's economically feasible for practices to do it. You shouldn't have succeeded. You shouldn't have been able to get payback within two years because you had a practice of five physicians or less. You're just below the hypothetically cutpoint for this making any sense for physicians.

Do you think that those estimates are overly conservative? If given proper help -- I don't know what that source of technical assistance would be, but given proper help, based on your successful implementation what do you think is the cutpoint for this to have positive payback even in the current bankrupt payment environment for physicians to put in place an EMR of the level of robustness that you successfully implemented?

DR. OMURA: If there's no increased reimbursement for performance and no other inducements, I would have to agree that you'd in general need to be bigger than the size that we were to start this project. I think we had the mindset to do this. We picked a good program. We had the initiative to make this work, and we had an environment that was supportive. All those things put together make this work out well.

But I've run into lots of offices that have had problems at the four-doctor level, six-doctor or 10-doctor level, so I think we're just a little unusual. I don't know what that number is. I would say probably bigger than the size we are now. I mentioned that are 30-doctor practice now is having problems financially related to the EMR. So I would say that you'd probably need to be bigger than that.

DR. WALKER: Just as a comment, we have implemented practices with one doctor and one PA. So clearly one model is to have an organization that has the capability to do it and the incentives that provides it to small practices on some other

basis than direct cost.

MS. RAPHAEL: I just wanted to ask if you could amplify the issue around immature software, because I'm not sure I entirely understand what you're getting at?

DR. WALKER: The software, most of it was designed and built 10 years ago or so and has structural, architectural characteristics that make it hard -- for instance, you could imagine a system in which when you entered pneumonia on a patient you were admitting it offered you a set of questions, because there's a validated set of questions that you can very reliably predict whether a patient should go home on oral antibiotics or go to the ICU. So the system would ideally provide you those questions. You'd answer them. It would calculate the risk and say, this patient is safe to go home, and then give you the order set, and here's the appropriate set of medicines for this patient, pick one.

That whole process could be done in about one-tenth the time and with 10 times the fidelity that it is currently done. But the architecture of the systems doesn't allow you to put together and end-to-end tool like that that does a couple things. First it means you always capture the right --

A better example perhaps is atrial fibrillation. 25 percent of Americans over 65 have atrial fibrillation. You can calculate a patient's risk of having a stroke percent per year. But in chart reviews that we've done of 100 patients, not a single patient had enough data in the record that you could have calculated that risk. So you have a situation where if you had this tool you could say to a patient, your risk is 10 percent per year, your risk of bleeding in your head if we put you on the blood thinner is 2 percent per year, what do you want to do?

Instead what we have is a set of rules. Talk about cookbook medicine -- that says a-fib equals warfarin, equals blood thinner and you get tested every four weeks for the rest of your life whether you need it or not. So the software doesn't let us build that kind of tool that makes it so that physicians are reminded of that calculation aid and then enabled to make it into a workflow that really runs. There's a whole lot of examples like that.

DR. McDONALD: There's this optimism of the world of new technology is always good or right. There's a great book called Wicked Problems, Righteous Solutions and it's about software design and technology. How it defines a wicked problem is one that's never been solved before, and two, one that might have been solved before but has a human somewhere in the loop. Because you can never predict the behavior of the humans.

We're introducing radical new changes for humans in these system. So we don't know anything yet about how to do this right. We are in an immature era. In medicine, in '65 I was an intern and we knew everything. We knew everything there was and I got skewered for accidentally -- I thought it made sense -- giving a patient who was having chest pain and an early ischemia a nitroglycerin. That was known to be completely wrong because

they knew -- now we do it routinely.

But in each era we still think we're perfect. We don't remember we're just as stupid as we ever were, we just haven't learned it yet. So we had that problems in the software development area too. It's going to be 10, 15 years before we -- it's partly the architecture, it's partly the technology can solve these things, partly understanding what we're really trying to do with this stuff.

DR. WOLTER: I wish I could ask this as quickly as you'll answer it, Dr. McDonald. I just wanted to see if I understood what you did in Indianapolis. What I believe I interpreted is that you created a data warehouse into which a group of agreeable institutions put their data. So in essence it's remotely hosted data at that point.

DR. McDONALD: Yes.

DR. WOLTER: Related to that I'm wondering how issues around privacy and security have been dealt with in terms of who accesses it, and how much of the information they can access. I'm wondering if the vendors -- because I'm assuming this meant interfacing legacy systems that were somewhat disparate -- were the vendors cooperative, and how difficult was that for you? Then lastly, were providers able to agree on the format of looking at lab, and were labs integrated by time, or were they all still in separate places depending on when and where they'd been done?

DR. McDONALD: You described it well. The only extra step is we standardized, so we did mapping for the codes and the lab. The same thing that everyone is trying to do. We are very nervous about how much we open this up, and we've been very slow. So the access that's available to physicians across the thing -- only ER physicians, only after the patient is checked in to that ER, and then we leave it open for only 24 hours. Our next step is for hospitalists and full-time hospital physicians, an analogous rule. We get these messages. We get all the ADT messages so we can tell that.

Then for practices, the way we think we'll go is that we need to get a hold of their scheduling system. HIPAA would allow us to say, you're an authorized physician, we'll give you a password, a strong password. We've got a secure line to your place. Let anyone in town look it up.

But I don't think we're ready for that. It's okay, but I think people will go, what are you doing? So we're going to go very slowly and test the waters and make sure we have acceptance in doing it, where we have a further narrowing of who can look at it and what circumstances.

In terms of the vendors and the legacy system, any system that really works is a legacy system, you have to remember, because they never work out of the box. I'm actually surprised that people do believe software is good because everyone uses something on their desktop and it crashes on an average about 10 times the day. I won't name names.

So the vendors didn't have to do anything. Everybody has

HL7 messages, and they all have interchange engines and they just turn them on. They're sending them from here to here and they just send a stream to us over a secure line. So that's the beauty of the HL7 version two.

We have a little pre-processor because there are things that are goofy. We re-translate them into something that is more standardized. Then there is the big problem of the codes. So we have to sit and look, what you mean by glucose? Is it urine glucose or it is serum glucose, or is it a dipstick? We have a table. That's the hardest thing.

Then the other hard part is they send us stuff that isn't really where it belongs. It's not a problem of sophisticated stuff. It says milligrams percent. That's a unit to almost everybody's eyes. And there's a field called units. But it's over somewhere else. It's usually in the value field when they do it wrong.

I think Medicare could make the right. They just love a couple mls per -- you give them another 10 mls on each of their lab tests for sending it out right, I think you'd end up with very fast compliance.

I don't think I answered -- oh, the standardization. We really have two threads. The data that we do the code standards, that see it as a flow sheet. It's merged together. Each result is flagged and there's a footnote about the source if it's not from their hospital where they are.

There's another mode where we are just sending reports out to be filed in physicians' offices, and that we did get formal agreement, so far, that they'll look like this. The name will be up here, and the only difference between each of the sites is they can have a logo. This is St. X and this is St. Y. Actually they think that's positive because their eyes will get habituated to where to find things on the reports.

DR. CROSSON: This is a bit more of an observation than a question but I would invite the presenters to comment on it. First of all, congratulations on very fine presentations. This has been very helpful, you can probably tell from the conversation.

But getting back to the issue around incentives and how incentives might be used to catalyze this kind of change, I think it's clear to us that there is a change curve here and that we've probably moved off -- you have helped move the whole situation off of the flat part of the curve where a lot of work goes on but not much change happens, to a point where there are starting to be inflections. The sense is that the change is going to happen, and yet continued community-based, particularly catalyzing of change is necessary.

So what I took away from the discussion was that those kinds of initiatives that you each have engineered need to still take place, but they can in fact take place at different levels. The level of individual providers, the level of institutional providers, and the level of the community led by champions like Dr. McDonald and others.

So what that means to me is that in thinking about incentives or creating incentives we have to do a couple of things. We have to be very clear where we want it to go. I think we've had instructions here that one place it needs to go is something that allows the community to be connected. Another place it needs to go is to make sure that the systems are in face used to drive towards the availability of information that actually improves patient care, for example, improves resource utilization and the like. And the clarification of those endpoints is important.

Secondly, that whatever is done, particularly in the short term, stimulates others at every level to become agents of change, and at least does not inhibit that at any level. So I'd just invite --

DR. WALKER: I just want to comment very briefly. Clem is right at one level, that large organizations like ours are going to do EHRs. But it is a constant battle in an organization like ours, and I assume all other organizations like ours, to continue to make the case to invest resource in really making EHR effective. It really does continue to take very large resource. The model in most organizations is you have an implementation team, and when the implementation is done the team is disbanded.

What we are moving toward but could use some help making the case for, even internally, is seeing that implementation team as largely transferring over to a post-implementation enhancement team. Using those trainers to continue training, and using those analysts to go back and revisit those workflows and make sure we really have made them maximally efficient, maximally error proof. That is an ongoing battle, and one of the reasons I would like to see pay-for-performance is because that helps us make the case to ourselves that what we have got to do is drive this EHR home, not just say, okay, we've got it, now what's the next thing on our corporate agenda.

DR. McDONALD: He's right. Actually one other things in terms of big organizations. We started with the hospitals because, they have the data. They've got a lot of it, so there's a mother lode there. Secondly, they have money. Office practices have no capital typically, because they're sub-S's. They basically don't have any money to make the investment, so there's a real challenge.

But I think the idea of the big -- certainly when there's one big organization, facilitate them, let them be the hub that provides the medical record. It gets tricky because ideally the practice would like to put other stuff in there, so there's technical trickiness to it, and there might be political trickiness to it. But they really have the power and the infrastructure to be able to deliver that. It gets tricky, but do not inhibit that, because there is this inurement thing that does inhibit it.

DR. OMURA: I feel that just having an EMR, I've seen lots of offices that have an EMR and it makes their day-to-day life a little bit easier but they're not utilizing it to the fullest

extent because it requires staff, it requires meetings, it requires a lot of effort to optimize outcomes, and there's not a lot of incentive in that direction. So I would encourage movement toward pay-for-performance.

We are part of a research network with our program and we're one of about 100 offices across the country where they're pulling data on a regular basis, once a month, to look at laboratory results, blood pressure control rates and things like that. So we actually have a system in place that can look at, by doctor, what percentage of patients have blood pressure in control, and what cholesterol levels are, things of that nature.

The physician who is number one across the country, no one knows who that person is and there's no increased reimbursements or incentives for that person to be number one. But I think movement in that direction to help to reward those that are spending the most time and effort to provide better patient care is worth considering.

DR. REISCHAUER: Let the thank you for three really wonderful and interesting presentations. I certainly agree with what the common conclusion here is, which is pay for performance, don't pay for hardware, software, IT.

But what I'd like to probe a little more is the notion that both Dr. Omura and Dr. Walker raised which is, there is little economic incentive for groups or small practices to go into this. Both of you said that and then you provided, it struck me, a rather convincing case that that wasn't true. Here we have the five-person office where the choice was invest $200,000 in a new building and then variable costs for the rest of time of a couple more clerical employees. Both of these expenses you would not get any increase in reimbursement for. Versus $120,000 which you're going to pay back in two years, which I don't know what kind of other investments you make but I'll give you my retirement funds to invest if that's your idea of not a very good ROI.

Geisinger, you're basically capitated in a way.

DR. WALKER: We're not.

DR. REISCHAUER: You're paid per service?

DR. WALKER: About 30 percent of our patient population is capitation, the other 70 percent is fee-for-service.

DR. REISCHAUER: That's too bad, you're ruining my argument. The argument being that you're talking about reduced hospitalization, reduced drug use, reduced this, and if your revenue stream stays the same you're actually getting quite a bit out of this. And Dr. Omura is getting the quality bonuses, presumably, that are associated with these payments.

So it strikes me that what we aren't doing is the right comparison, which is what were your alternatives to this? The alternatives in Dr. Omura's case was a bigger building, and a lot more employees, and a lot of hassle, and maybe no quality payment versus this. It might turn out that this is really quite a sensible investment.

And in your situation it is conceivable that Geisinger might

have gone the way of some other institutions in similar kinds of situations over the last decade, but the quality that you showed your purchasers, which in no small part was attributable to this, kept this group alive and growing and really a model for the rest of the nation. So it's really that versus the counterfactual that you should be examining when you decide, does this make sense? It strikes me that there's lots of other hurdles that small groups have which keep them from doing this, but it isn't necessarily the financial incentive one.

DR. WALKER: Our direct costs are about $50- to $70 million at this point. We provide IT services at 70 percent of national benchmark costs. That's for 500,000 patients and 600 physicians. That's probably as close to as good as you can do. That's direct costs. That isn't all of the indirect costs.

We would do it again. We think it's the right thing to do. We believe that within the next five years we will actually see efficiencies that do start to measure up against that cost. We don't think that you can provide anything like high-quality health care without electronic information systems, including an EHR.

But from a policy standpoint the issue is, how sophisticated does an organization have to be? How smart and passionate about business transformation does the CEO and the CMO and others have to be? How optimized does your governance structure have to be? And a lot of other factors. How optimized does the situation have to be before the organization can make the decision and then execute it? You have got to remember, 30 to 60 percent of these projects still fail. Cedars-Sinai spent $31 million and had to pull it and has no plans for restarting it.

So I think the issue is, at the margins, how do you make it easier for an organization that is not as blessed as others with a number of those factors to make this decision and then execute it? Which is equally important.

But I grant what you're saying. The issue is though is that nobody has done a credible ROI study on this at all. Not even halfway credible. When I show benefits, I call it benefits realization. I do not call it ROI, because if you were a stockholder and I called it ROI, you would laugh at me.

MR. HACKBARTH: Pete, last comment.

MR. DeBUSK: I certainly enjoyed your presentations. Dr. Omura, I realize you're probably not a part of an integrated health care system, but the other two, are you part of an integrated health care system?

DR. WALKER: Yes.

DR. McDONALD: I don't know. I'm a university guy so I don't know.

MR. DeBUSK: Does the hospital own you, the university?

DR. McDONALD: No.

MR. DeBUSK: Does the university have a hospital?

DR. McDONALD: No, not anymore.

MR. DeBUSK: I was looking at it as being a part of an integrated health care system, if we went back and incentivized

all the providers within the system to report the data, through the payment system, then you'd have all players, you'd have the complete system integrated. The data would be reported from all providers. Dr. Walker, I guess that would be the ideal world, right?

DR. WALKER: It would certainly have clear advantages. For one thing, even in a well-governed organization like ours where our 600 physicians are employed, our physician leaders have EHR implementation goals in their compensation plans and so do the physicians, even in that setting it would change the discussion from, do we have to do this to, why are you taking so much time getting this in and getting me order sets and note templates and things so I can start reporting these things and getting paid?

MR. DeBUSK: On a national basis, with the evolvement of the IHNs over the last 10 years, here is a matrix that's probably a starting place where you could make this thing work, where you could actually incentivize the players. You've got to find someplace to start. You can't start in that one-man office. There's no two ways about it. But here you have got mass.

Anyhow, thank you.

MR. HACKBARTH: Thank you again. It was very well done, very informative. Wish we had more time, but we don't, alas. Thank you.

Because we are running a bit behind we're going to need to keep moving here. We have a series of mandated reports that we need to go through, beginning with the report on physician volume.