I wonder if in a couple of years we're going to have that put together and we're going to start building all that cool AI stuff. This is hard work as all of you know, working with data, working with data, multiple participants, and so on but we've actually made some pretty good progress.

And then in the introduction, we've alluded to IHIE or I-hi as I'll probably say it during the presentation—the Indiana Health Information Exchange—which is a collaborative effort, not-for-profit corporation that was developed in order to provide the infrastructure, the platform if you will, for sustainability of this work. So, with any health information exchange, a whole lot of data, go up to 42 FTEs we focus on customer support, business development, things like that, whereas the Regenstrief Institute is focused on research and development, applications support, and technical support.

And of course, we do all of that to help the patients at the end of the day and that may sound a little hokey but really, at the end of the day, that's what gets us through a lot of the governance issues, a lot of funding issues, is going back to the patient.

And the problem that we're trying to solve is this one, and that is that patients, as they travel through our healthcare system, touch a lot of places where there are electronic systems and electronic data and they leave footprints there, data in the hospital, laboratory, and the pharmacy and the physician's office, practice, and so on. The problem is that the data is separated in these silos.

This very busy bar chart is intended to help illustrate that problem. If you look, for example, at the second bar, laboratory results, each band in that bar represents a different source of laboratory information in the central Indiana market.

And over on the right-hand side, you can see all of the different places where data comes from and this is just a set of samples.

And a couple of points I want to make out is first of all, these silos or these footprints are probably distributed, left in a lot of places, and once you get past the first couple of large potential sources, whether it's hospital systems or laboratory results or medications, it starts to get real thin and in fact, the kind of peach color tops of the bars for medications and physician practices represents the chunks where it gets so distributed that it's hard to aggregate so physician practices here go down to about 10 physicians.

So, 40% of the practices is very consolidated actually in the central Indiana markets are in practices of 9 or fewer and so it's very hard to find all of those footprints, to find all of that information and bring it together in order to take care of the patient.

The way we approach that, starting in the top right-hand side of this figure, is we capture data in real time from those data sources, from laboratory systems, radiology systems, pharmacy systems, and so on and as we bring it together, we normalize that data. And then we store it in separate vaults, separate repositories for each participant so this takes care of the problem of the small physician practice whose systems aren't going to be available 24 hours a day, 7 days a week or 10 years after they go out of practice.

We have 3 important pieces in the middle to tie this together, in the very center is the concept dictionary. We have to map the terminology. Every laboratory, for example, calls the serum sodium something different and we have to, as that data is brought in, normalize it or standardize it to a common set of terminologies, that's the concept dictionary.

The second piece in the middle is the global patient index. As you know, every provider in the community describes the patient differently. They have a different medical record number, if they have one at all. Using a probabilistic matching algorithm and patient demographics, we are able to link together patients with very high specificity and moderate sensitivity. In other words, we almost never incorrectly link information and we occasionally fail to link correct patient information but that's okay, because we'd far rather do that than make the mistake of putting together data for 2 different patients.

And lastly, I think people often don't think about the global provider index. Providers in markets have many, many identifiers, they have 49 now in central Indiana, as a physician. And if you want to do quality improvement, if you want to do results or whatever, you have to know who is who. And that's the closest thing we'll have to a technical slide today, you'll be glad to know.

So, where have we gotten to today? This is a diagram of the state of Indiana and the "Hs" represent hospitals. The red dots represent physician practices, obviously at this level, there's many physician practices underneath some of those red dots. There are some "Ls" and "Rs" hidden in there which are laboratory and radiologic imaging centers. The ones that are blue are the ones that we haven't touched yet. The ones that are colored are in some form linked into the health information exchange and today we reach approximately 10,000 physicians across the state of Indiana through the exchange.

So what do we do with all of that? Well, the first thing is, when we bring that information together, it's like a telephone exchange. We now have standardized or normalized data that we can begin to build different kinds of users, different kind of services around. I'm going to go through some examples in the next few minutes of some of these services that we've created.

Critically, in the middle of that is a process we refer to as negotiated access. Each and every use of the data is carefully discussed, considered, and weighed by a management committee that represents, if you will, the community conscience. That's a very important part of the management structure.

Representatives of the data sources, the hospitals, and so on, that make data available, help make the decisions about how that information will be used very specifically under what conditions. So, for example, for an emergency department visit, the provider may get information about the patient if the provider is designated by the institution where the patient's receiving care, if the patient has a registration record, a registration message from that institution, if the device that the physician is using to access the patient's information is located at the institution and then for only 24 hours.

So we've set those kind of rules, those kind of scenarios to ensure that the patient's privacy is protected and the information is being used for the intended purposes.

I'm going to march through a series of these services that we have deployed to date, if I've previously described them, and then come back at the end and talk a little bit about sustainability.

The first services are for doc clinical messaging services, which is just a simple thing. It focuses on giving the right information to the right provider at the right time for the right patient. Many of you may know that about 14 to 15 percent of the ambulatory sending of results never reach the physician or reach the physician too late. In addition, there's a huge cost to delivering that information. Prior to implementing our clinical messaging service, it cost about $.81 for a laboratory or radiology center to get the report from their system into the physician's hands.

And the – there are 3 ways that we can deliver it to physicians. One is, if they have electronic medical record directly into their record, for the physicians who are on the fringes who may get very few lab results or something, we may deliver those by facsimile and the majority of providers receive it through the docs-for-docs application, which is a secure Web-based portal. It looks a lot like an email application. If you click on one of those, what you get is a report that looks a lot like what you would have received through the mail or facsimile in the past. They can use it online, they can print it and put it in their chart, however their workflow works.

This slide is a little out of date, there are now 10,000 physicians and 3,400 practices and we deliver about 45,000 results every day through this system. And that translated, in central Indiana, to a $7 million savings, a $7 million cost reduction for data sources last year.

The INPC or Indiana Network for Patient Care is a longitudinal patient record that we've been developing for over 10 years and is in use today by well over 4,000 physicians and there's a couple of things. First of all, when a patient presents for care at the emergency department, inpatient setting, or physician's office, the provider may choose to receive a clinical abstract, a 1- or 2-page summary of the patient's information, highly condensed form that's pushed to them as a result of the patient registering for care at their site. And this is a very powerful tool for informing, for cluing clinicians that there's information available that they may want to pursue. But sometimes they need more detailed results and there's a Web portal that can be used to drag down into much more detailed information.

Because the data is normalized and standardized, it allows us to present, for example, the bilirubins in the middle of the slide, even though they're coming from different laboratories across a couple of different health systems, we can present the clinician a comprehensive, cohesive view of the patient's data because the data are normalized and we understand that a bilirubin direct or a bilirubin indirect from each of the institutions is really the same thing. And of course, you can drill down on this information and view radiographs or review documents, for example.

This is an example of an MRI study.

There are approximately 12 million unique registration events. You need patient IDs in the system, a little over 1.6 billion clinical results stored on data going back as far as 35 years for some patients.

In a randomized controlled trial, looking at the benefit of this in the emergency department, in other words, making this comprehensive longitudinal patient data available to care providers in

the emergency department, we showed a $5 million per year reduction in charges in the central Indiana market and I would think there's much more to be saved than that and we're currently in the midst of doing a study in the ambulatory setting.

In terms of public health, in partnership with the Indiana State Department of Health, we used this same environment, these same flows of data for public health emergency surveillance. As a quick example, in 2000, we had a very large outbreak of a disease called Shigella where it causes diarrhea and nausea and it's particularly difficult for young children and the elderly, and in this example in 2000, it's before we were delivering information routinely to the health department, the bars on this charge represent the number of cases of Shigella that we were able to identify through our surveillance systems running against these data streams that we described and the dots represent what the health department knew about on those dates.

And essentially what happened is that in January we noticed that there were several cases of Shigella. I thought that was a little unusual. I talked to the health department. They said, it will pass, we see them occasionally. In mid-March, they finally sent out a letter to the physicians in the market suggesting that indeed we do have a problem and then in April, this newspaper article came out. This outbreak cost the community well over $10 million in lost wages, direct medical expenses, and so on. So you wonder what an earlier intervention might have done.

Since we have started working together with the health department on a routine basis to implement surveillance, we do much better. In this example, I think this is from 2005, December of 2005, this is a Friday afternoon at the far right, that red dot showed up and there were in excess of about 10 cases of gastrointestinal complaints in emergency departments on that day. The health department noting that spike, investigated with the patients, followed up with a grocery story that had some poor food handling practices, corrected those and we think interrupted a potentially very large food-caused outbreak of disease.

Similar sorts of opportunities with respiratory symptoms and so on as well. I'm going to skip through a couple of these because it's a little less relevant.

The next service I'm going to describe, there's only 2 more briefly, is Quality Health First of Indiana, which is really a quality improvement initiative, multipayer, multiprovider collaborative, focused on improving care for patients in Indiana.

So what – for physicians, what we do is we combine medical, drug claims, and other clinical data to provide them with reports of their overall performance and this is multipayer, across Medicare/Medicaid, commercial plans, like United and Wellpoint, not just a single payer, as well as specific reminders about patient interventions that would be important to help improve care.

Health insurers get this same information for their beneficiaries and build incentive programs around that, around this common set of measures rather than each of them having their own models. And Medicaid is an important participant in that in our market. And the payers support the cost of the program as well as provide incentives for the physicians and those measures are chosen from national measure sets by the physicians representing the health plans and the physicians representing the provider groups. They are focused largely on outcomes but not just

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did the patient get a glycosulated hemoglobin done but how well controlled is the diabetes? Is the level of cholesterol control appropriate for the patient's risk factors and things of that nature.

And then that information is delivered to the clinician in a form that they can review and act on so if you drill down on these, you can go back and find out that Sally Jones is the patient whose diabetes is poorly controlled and she last was in your office, you know, 13 months ago for example, which might allow the clinician to intervene with that individual patient.

The last thing which I've been busy with for the last several days is a good example. We've had, as some of you have seen on the news, terrible flooding in the southern part of the state of Indiana leading to the closure of some large hospitals and the inability to access a large number of physician offices, medical records destroyed and offices not being staffed. And so patients' records are unavailable, and I'm glad to say that our Family and Social Services Administration that runs our Medicaid program rallied the troops, if you will, to begin to provide, based on the IMPC, a personal continuity of care record, making that available to providers who were caring for patients who were affected by the flood, much like the Katrina health effort several years ago.

A few words about sustainability. I've described some of these different services that we've built on and some of them had different kinds of values. The first one, the clinical messaging, for example, is a transactional value. We reduced the cost of the transaction and bring value that way. We think that we are creating with Quality Health First clinical value. We're improving the care that patients get leading to reduced costs and better outcomes.

And as you put these different pieces of value together, sort of a patchwork quilt, my poor graphic here, sort of a patchwork quilt of value, you can begin to assemble revenue streams that are sufficiently large to pay for the poor infrastructure that bring together and normalizing the data that we talked about at the beginning.

The last thing, we've been at this for about 12 years in Indianapolis, starting with funding from federal grants and so on to do the research and the development. We've launched the Indiana Health Information Exchange 4 years ago. It's now self-sustaining, cash-flow positive, and able to continue to provide those services over the long run. And we've been asked by so many people to help them move ahead, we've created a group now called Mergetics, catchy name, that's designed to provide the services for other communities outside of Indiana including hosting and training and support and so on.

So it's kind of a quick overview of the work that we've been doing in Indiana and I will try to answer questions when we get to the end. Thanks very much for your attention.

Thanks so much, Mark, a very great presentation. As I said, if you want to type some questions in, please go ahead and do that in the chat box, we'll be monitoring that and get to those questions after the next presentation from Tony Rodgers. Tony, take it away.

Well, thank you very much and good afternoon or wherever you are, it's still morning. I'm going to talk about 2 aspects of health information exchange.

Let me see if I can move the – do I touch – do I hit the arrow to move it, to move the presentation?

Top right of the slides, Tony.

Okay. Thanks.

There you go.

Very good.

Each of these Web conferences have different arrows at different places, you have to figure it out, but thank you.

I'm going to present on 2 different areas, as relate specific to the Medicaid and SCHIP participation and health information exchange.

One, what is the value from our position to Medicaid and SCHIP and the roles and options that Medicaid agencies have in participating in health information exchange?

Now, it should be very obvious to most Medicaid organizations that we've grown considerably in terms of membership over the last 5 years. Most Medicaid programs either expanded their income levels or their benefits and so the importance of an efficient quality-producing health care delivery system is extremely important today for Medicaid and SCHIP. So the purpose of health information exchanges, as related to Medicaid, is to improve the Medicaid and SCHIP health delivery system efficiency and to improve patient care quality and safety for the rapid and continuous adoption of clinical best practices, and for the public health and disaster response and I think you've heard how Indiana is approaching these issues.

One of our challenges in every state is that the health care environment that Medicaid and SCHIP provide services in is very complicated, whether it's environments that have manpower shortages to the regulatory environment to the number of competitors to the network design, economic trends, etc., and these translate down into their effect on health plans, hospital networks, providers, consumer expectations, and payers, and so the exchange of health information has to account for, if you will, the health care environmental culture of the state as well.

But Medicaid and SCHIP are unique in that they are state programs so they usually touch every single aspect of health care delivery, of the health care delivery system, and so they require a public/private partnership or public and private solutions for moving any states forward in terms of health information exchange and the use and adoption of health – of electronic health records.

When we look at the 21st century Medicaid program, there are new core competencies that Medicaid has to provide, either through contracting with managed care organizations that have these core competencies or providing it as part of the agency's responsibility. And these core competencies are going to be impacted by electronic health information and need to be integrated with the opportunities that exchange of health information provide so that more real-time case management is ____(20:57) management, medical management can occur, more efficient operations, not only at the agency level but whether it's through a health plan operation becoming more efficient or at the provider level in terms of the exchange of the electronic transaction, electronic information.

And then one of the other areas is our customer care area, the ability to, using Web-based connectivity, to really push information out to our Medicaid beneficiaries in new ways and new ways to connect with our Medicaid beneficiaries and this should impact our ability to financially manage going forward to have greater transparency of costs and quality.

If we look at the trans – the system transformers, there are 4, if you will, focus areas. One is in population management, being able to see how the population is being medically managed, including the ability to have disease registries, to have transparency in terms of health system performance, public reporting, and public health surveillance, and then there's the care management, the actual point of care, is the care management consistent in terms of costs and quality? Is it integrated from a hospital to the primary care provider? Does it optimize the health of the beneficiary or the member?

Then there's the decision support capability, there needs to—electronic health information and exchange provides the opportunities for alerts, messaging, providing just-in-time guidelines, clinical—new clinical knowledge transfer so that new discoveries, the cycle time between a new discovery or new evidence-based medicine getting into the systems of care is reduced because that information can be provided at the point of care.

And then, also, patient self-management. We can't reduce the cost of care unless our patients and our members do better self-management, better compliance to doctor's patient care plans, to enhance their ability to use the data in personal—their personal health records to more effectively manage their own care and then to pro—to push information to them that's just in time and more personalized regarding their personalized strategies of wellness and behavior modification.

And so electronic health records and the ability to exchange data provides this opportunity, the state's infrastructure, that can make that—make all of those system areas transform and operate more—in a comprehensive and integrative fashion but operate also with lower costs and better quality.

So, to summarize it, what is the value proposition to Medicaid and SCHIP? Well, the widespread use and availability of electronic health information and their ability to be exchanged through interoperable systems and through regional health information organizations can provide the Medicaid agency with greater access, providers with greater access to relevant and timely health information and electronic records at the point of care and this is extremely important.

In the data that we have, we see a lot of variance in where – in terms of provider practice, not because providers aren't trying to practice at the highest quality but because they don't have a single source or single view of the patient's health information.

It also facilitates the use and supports medical/home coordination of care. So the ability to exchange information with hospitals and other providers makes medical home more effective and certainly provides greater coordination of care and that's a major value to Medicaid and SCHIP.

It improves the medical and administrative efficiency of the system. A number of extra lab tests that are ordered or extra X-rays, just because the results aren't available or even the

administrative efficiency of a doctor's office with a number of prescriptions that they write but then they find out are not on the formulary. All of these things are opportunities where we can streamline the system.

And then finally, greater health system accountability and transparency both at the enterprise level of the agency as well as down at the physician level so that they can actually see the care – the episode of care on their patients as well as align with the –what the agency's able to see in terms of transparency of costs and quality.

So as we look at the value proposition, the, I think there's ample evidence and there's been a number of studies and we have heard today what they're able to do in Indiana, the basic value proposition is that at the point of care, with the ability to exchange health information, electronic health records, we should see improved patient safety, reduce complication rates, reduce the costs of episodes of care, and improve quality performance.

All by creating that infrastructure to exchange information among authenticated and authorized users so that they have a single source of what we would call truth in the patient care's electronic health record and this will enhance better outcomes at lower costs, which is extremely important considering that Medicaid has been growing in membership and that Medicaid typically has the most vulnerable populations, the chronically ill, long-term care populations that have significant comorbidities and so this will have great value to Medicaid and SCHIP.

This is an example of how transparency and cost and quality can be seen, not only at the provider level, but also all the way through to the agency. The ability to aggregate the data from health information, electronic health information from various sources, coming through a regional health information organization, can allow the Medicaid agency to have a new view of the data and actually see the variance in episodes of care.

Now, why is that important? Well, one, we do see significant cost variance in the same type of episode treatment group or episode of care and so we have to see why that cost variance occurs. It could be because the patient is on a more expensive drug and there may be a generic available or maybe you will see extra utilizations such as lab or maybe there's an emergency room visit that could have been avoided and so this transparency allows the Medicaid agency or the medic – if the member's in a managed care organization, for the managed care organization to do more directed case management and disease management.

To the physician, it allows them to see where the patient is in terms of where they are in the care episode, if you will, and it gives them some indication of what evidence-based medicine says the actual care episode should contain. And eventually, this can also help educate members to let them understand what is their care episode so that they can follow along with the physician in terms of working in conjunction with their physician, very – in terms of improving their own patient self-support and compliance.

So, what should we see if we transform the system? We should see improved performance metrics within Medicaid. Lower pharmacy costs per member per month. Lower diagnostic costs, reduction of duplication of diagnostic procedures, lab procedures, higher percentage of long-term care members that can be supported in home and community settings. Lower days per thousand

and lower number of admissions to the hospital. And indeed where we have seen the use of health information exchanges, and even though in many cases, it's just basic information, we have seen these kinds of improvements in the overall system.

There should be, we should be able to see lower costs overall of long-term care. The number of times a patients is admitted into the emergency room from a nursing home can actually be reduced if there is an ability to provide health information exchange to the nursing home and to the primary care provider or physician who is attending that patient while in the nursing home.

Then we should see greater satisfaction. Our members, our providers, lower emergency room visits and I think with the new study, it's showing that this is very possible to see the reduction of emergency room visits and this goes directly into saving the Medicaid program significant dollars as well as greater health care access.

And why do I say there can be greater health care access? Well, the system is more efficient if you reduce the number of emergency room visits. If you enhance the provider's ability to be the medical home, it should increase the access to care for the member.

And then, finally, reduction in administration inefficiencies and processes that increase the cycle time of whether it's prior authorizations or claims or the amount of extra hassle involved in medical audit of a physician office. This information now could be provided electronically.

So, specifically, we know that there's value of health information exchanges at the provider level in terms of coordination of care, medical decision making, administrative efficiency. At the managed care level, in terms of oversight, medical utilization review, quality improvement, disease management, and the ability now to have pay performance systems that use the data so that you can actually pay for quality in your network. It's more difficult when you're only using claims data or the time lag between the time the claims are paid and the time that you can review performance, it's much more significant, it's really too long. This allows you to have much more real-time opportunity for paid performance.

At the enterprise level, though, you have many of the same values at the oversight, the ability to audit remotely using health information exchange through the exchange, the ability to direct your quality improvement efforts and also to do population management and fraud and abuse detection and prevention.

So these are some specific areas where most of the data suggests are high value data exchange records or documents. Certainly, patient medication lists, lab results, immunization records, discharge summaries, problem lists, eligibility data and administrative data, confidential care record, diagnose, imaging and etc., and p___(33:01) reports are extremely valuable to the provider level in our system. And if that information can be exchanged, this has great value in helping the provider to provide that continuity of care and supports the medical home.

At the managed care level, though, we also see value in the exchange of data. It is very helpful for a managed care organization to be able to see the medication lists, if they're doing case management, see where medications are being prescribed, whether there's duplication.

It also provides the opportunity, whether it's through e-prescribing or other applications, to send out alerts to providers. Newborn screening information, lab reports, discharge summaries, all of these help a managed care organization to manage, to do disease management, aggregate the data so that they can look at how well providers are performing. Immunization records and continuity of care records. All of these are high value data sets for the managed care organization.

Then at the agency level, you have a similar set of high value data which allows greater oversight, greater quality assurance, the opportunity to align clinical decisions support with enterprise decision support, the opportunity also to do incentive programs and pay-for-quality programs.

What I provide here is kind of an example, a very high-level example of how Medicaid or SCHIP data exchange relationships can work by interfacing with the health, with the RHIO, the health information exchange, be able to pull and push data from data sources and to push data to data sources through the health information exchange. But the value to the Medicaid agency is these unique data sets that now can be more real-time that allow for clinical data to be stored and to be analyzed allow for knowledge repository and to bring in opportunities to push out evidence-based medicine and other information and messages, alerts, public health alerts, to the community providers, etc. All through the health information exchange. And this really enhances the core competency of the Medicaid organization. And all of this has to be wrapped around a set of standards that allow this exchange of information and standard data steps.

So what's the role that Medicaid can play? Each state is moving in a different direction. Some states already have significant regional health organizations organized, some states are just beginning. There are 3 real roles that Medicaid can play. One is with the Medicaid transformation grants. It's possible that some states are actually implementing their own health information exchange, whether where RHIOs don't exist or the exchange of data among their providers. This usually works the best where you have a dedicated set of providers, whether it's community health centers or hospitals, state____(36:32) hospitals that you work with. For the agency to develop its own exchange, you have to remember that physicians don't want to just see Medicaid health information, they want to see Medicaid, they want to see their commercial patients but if you have a dedicated network, it's possible to create an exchange just among that dedicated network.

The other part of this is that it assumes that the health information exchange can be built within the Medicaid information system environment which allows you to get reimbursement at a higher level and we'll talk about that in a second.

The other role that Medicaid can play is a data partner to the RHIO. And this is a very important role. Continuity of care record or other electronic information can be interfaced so that the regional health organization can provide that information over their health network. This facilitates public health information in terms of both ways being able to communicate health information to the public health organization as well as to exchange public health information through the health information exchange as well as Medicaid information, whether it's administrative information or continuity of care records, etc.

And then the final role is the data user. It's important that we not just look at it – at Medicaid as pushing data out but also receiving data from the health information exchange and this is really a new infrastructure that's going to be very valuable to Medicaid and SCHIP.

Well, one of the ways to move forward quickly is to find a financing mechanism that works for you. And there are really 4 ways that Medicaid can finance health information exchange. One is direct financing through grants or directly building an exchange as we mentioned and where they're using state and federal dollars to actually create an exchange operation.

Then there's contracting through the – with the RHIO to, on a per member per month basis or transaction fee or subscription fee to actually pay to push or pull that data to the Medicaid organization or to the providers, and this is a pay for data use fee to the RHIO so that the RHIO can use that reimbursement as a way to keep their operations going.

Then there's provider reimbursement. One of the ways to change, now, if you reimburse a RHIO directly from the Medicaid organization, you may pay—only get 50-50 participation by the federal government. In other words, the federal government will allow a 50% match on administrative dollars and depending on how you configure it, it may mean that you'll only get a 50% match. However, if you reimburse the physician, it becomes a medical cost to the physician as part of the reimbursement fee and then they pay the RHIO for the transaction cost or participation and this way, depending on your match, it may actually give you the benefit of a higher federal match because this becomes a medical cost versus being a direct contract service.

And then, finally, a Medicaid organization can be an equity partner and we've seen that in many states where the Medicaid organization is part of the governance and has paid in as an equity partner in actually helping to support the operations of the RHIO.

In terms of policy issues that must be addressed, certainly patient consent and every state is different. The culture of patient consent is different. In some states, it's very loose or at least very easy to move data because there's not a lot of patient consent barriers. In other states, there are significant patient consent requirements and so each Medicaid organization has to understand the patient consent issues and address that as part of the process. Also, the use of Medicaid data, whether it's strictly for treatment or if there's opportunities for the secondary use in terms of research or other use that has value to the Medicaid organization.

Liability indemnification. Many RHIOs, you have to address the liability and indemnification of the health information exchange either by contract or by agreement as to how the RHIO will be indemnified. The governance of health information exchanges is extremely important where their Medicaid sits on the governance or participates in the governance or sets some standards for how the governance must be organized.

And then the oversight of audit and authentication processes for exchange of data among providers, to make sure that that audit and oversight is clear and that Medicaid has the opportunity to see how data is being exchanged and be able to get reports that show when data is exchanged, etc.

And then finally, the health information exchange operations standards, in terms of reliability and other requirements and one of the states that's moved very far down the road on this is

Florida which has established a number of standards for RHIOs in terms of health information exchange.

Finally, I just wanted to give you a kind of view of the future. There are 4 infrastructures that are part of the transformation of Medicaid and SCHIP in the health delivery system.

One is certainly the exchange infrastructure, the ability to exchange within the state and eventually even outside of the state. The electronic health record infrastructure. The ability to have providers using electronic health information, electronic records, at the point of care and the change that will allow in terms of supporting medical homes, connectivity between providers and patients, connectivity between providers and alternative sources – places of care including home and community-based services or nursing homes and then Web-based e-learning or patient support technology. We have to realize that even though maybe today our Medicaid beneficiaries are not as well connected, in the future, we have to assure that there's greater connectivity with our Medicaid members, whether that's in the physician's office where there is an e-learning kiosk where they can sit down and get just-in-time health education that prepares them to have a good interaction with the provider or whether they can view that at home or an alternative site, this is extremely important to improving health literacy and to improving patient compliance.

And then finally, knowledge building and transfer infrastructure. That is, how do we get new evidence-based discoveries into the systems of care more rapidly to reduce that cycle time? We can use the exchange, we can use the infrastructure to build new tools that allow that knowledge building and effective transfer of new discoveries into our health care delivery systems.

So those are some of the 2 areas in Medicaid where we can see value as well as we can see our role and I'm open for any questions at this point or, I guess, we're going to do questions together.

Yes, thanks so much, Tony, another great presentation. And we've got some questions that have been coming through the chat box, thank you for those and I'll just start off by combining a couple that look like they are for Dr. Overhage. And that is, how long did it take you to get all parties to agree on your standards and governance and how did you lower your transaction costs?

Sure. A great question. As you can tell, there's a lot of things to talk about, you can spend hours on any one of these topics. I appreciate you diving into the areas that are important to all of you.

First of all, in organizing, the initial organization of the management committee took us probably 18 months. And that was, a lot of work was related to, and this is in 1996 or so, so a lot of that work was pre-HIPAA, so we had to do a lot of groundwork around the privacy issue and approaches. And that took a lot of the time and effort. The other issue that I think everybody faces is the fear, if you will, of competition. I don't know what, you know, as you all know, most health care organizations and peers don't use their own data very well but there's always that underlying fear that somebody else is going to use their data against them and so that's, that was a, certainly a stumbling block to get over.

Partly through experience, partly by having a neutral third party, the Regenstrief Institute which is not a healthcare provider nor a payer, and had longstanding position in the community, could address that to some extent so, 18 months is probably the best answer for that.

In terms of lowering transaction costs, it's actually very simple in that in most places today, if a patient gets a laboratory test result and the vast majority of those results are printed out and faxed or put in mail or some type of courier to the physician's desktop, there's postage costs, there's software costs, there's courier costs, there's fax service costs, there's line – telephone line usage costs, associated with that. We accept the result electronically from the data source and deliver it electronically to the physician so our costs are primarily in user support and training and the infrastructure which at first, the marginal costs for sending another result is virtually zero. So that's how we lowered the costs so dramatically from $.81 down to less than $.20 per results.

Thanks so much, Mark, that's really helpful. Another question and this is both for Tony and Mark, do you also or have you considered social networking in your models, in other words, using Wikis for knowledge exchange?

Mark, you want to go first?

Sure. Not directly. There's certainly a lot of social interaction, social engineering involved in this work and certainly a whole variety of things. For example, the Central __(47:47) Coalition for Patient Safety which is part of the Health Information Exchange, relies on Wikis for various kinds of collaborative work but not as a central thing and it's kind of an opening to talk about one thing which is keep it simple. You know, I think one of the biggest places people get into trouble is they try to boil the ocean, they try to do everything, meet everybody's needs, use all of the collative switches and a lot of what we've done has been a very simple, very basic kind of tools and approaches and you can do a lot with those.

In terms of the future, I think there are opportunities for using Wikis. I think at the agency level and especially if we collaborate with – whether it's universities or other individuals, we're looking at this, especially with our high-risk populations, as well as with our physicians. One of the studies that I'm aware of is that a number of our private practitioners who are solo practitioners, because they don't have the opportunity to collaborate and improve practice, they often times, we see a lower use of evidence-based medicine so we're working with our university to build some core competency in that area so that we can support that in the future. But I would agree in starting out, you've got to keep it simple. And then this is just a vision for the future but I do see social networking, especially for high-risk members, especially for our youth because they seem to already have interest in that and we have a lot of high-risk youth that can – that we can create social networks and then have professionals interface with them in those social networks.

If I can add one more thing to that discussion, too, I think that's important, that just as all of these things, Medicaid trying to work alone is often a tough road to go. The blues plans trying to work alone is a tough way to go. Collaboration makes life much easier and better and I think it's a really important way that the social aspects, the collaborative aspects of this work coming to play is by amplifying the ability of each of the participants to achieve their common goals.

Thank you both. Sort of a follow-up question in my mind to the social networking aspect is, how do patients know if they're part of the health information exchange?

Tony, you want to take that one first?

Sure. Well, there are a number of approaches that Medicaids are taking that are involved in health information exchange. One is at the point where a person is being registered or sees a physician, that are requiring that the patient be told that this physician's participating in health information exchanges. A lot of us are looking now at the point where people are being made eligible to start the informed information, informed consent process at that point so that people know that the Medicaid organization is supporting or participating in the health information exchange. And then, again, each state is slightly different in terms of the consent requirements and in some cases, no consent would be required if it's for treatment but each state is – that approach that differently but at least at the point of eligibility, we need to start the informed consent process.

Mark, did you want to add to that?

Only that we take a similar approach. Since HIPAA, before HIPAA, we used to get the patient's consent. We now provide as part of the patient's privacy notice in all care settings that participate information about how they participated in the health information exchange and how the patient's information will be used.

Great, thank you. A couple of questions that I'll combine for you. Are there quality assurance measures that help ensure that correct records are used and if there's an inadvertent error in linking a record, what steps do you take to correct that?

That sounds like that might have been directed towards me to some extent. First of all, the records being correct, and obviously there's lots of pieces to that but because we captured the data directly from the source, this is the record. You know, this is the CBD result, this is the radiology report. The only more authentic source of the information is to go to the system in which the result was generated. So the only issue, really, is you know, is there some translational error in the information moving from the radiology system or the lab system or whatever, and there are a whole host of internal validity checks they go in but by far the most powerful thing is the fact that these same data are used for so many things. They're used for research for public health surveillances and all of those things I described which means that they're scrutinized on a routine basis and odd-ball results get identified and things like that. So, for example, if you look at extreme values of any laboratory test like creatinine, if the creatinine's greater than 4, 7% of them are going to be errors, not in the health information exchange but in the laboratory system that generated them. So, by going to the source, you minimize issues around that.

The second thing about linking patients is extremely important, as I emphasize, is the algorithm that we developed that's been tuned to be specific rather than sensitive. In other words, we match and when we match, we know that 99.7% of the time, that's a good and accurate match under the worst case. We miss a few but that's okay. So, out of literally millions of patients, there will be a few 10s and those 10s are usually scenarios like twins born to the same mother on the same day in the same hospital with the same last name and one letter difference in their first name, things like that that can be very tough to sort out. When we find those, we can flag them as being inappropriate to match in the system and we usually do that through some of our routine management of that matching process. So we usually identify them before a provider would but if a provider were to bring something like that to our attention, then that would lead to those

being flagged as inappropriate matches and that would prevent them from ever being matched again.

I'd like to just make one comment. Having run hospitals, run health centers, been on the provider side, been on the health plan side, there's a lot of mix matching of data now in the paper record and lost data, inappropriate information that's put into a person's record. I think this will significantly reduce that because you'll have more checkpoints and more opportunity to validate the data is the correct information, which we don't have now and oftentimes does lead to misdiagnosis, etc., just because the information is somehow put in the wrong chart or not put into the chart at all, etc.

Absolutely and very important, Tony.

Thanks so much. Another question about potential problem solving. What happens if a system is down when a patient's record is needed, what backup is available, how do you handle that?

Well, for us, the first thing is downtime is measured in minutes a year. And we've been doing this for almost 14 years now and total downtime is minutes a year.

Now, the bigger problem is network access. In other words, the network from hospital A to doctor office B is down, that's the real risk. And the short answer is that it works just like it does today which is that providers work without information. They're no worse off than they were before. And that's not a perfect answer but it's the reality and like I said, the larger problem is network connectivity, not the system itself.

I do think that you can pay for the duplication or for the redundancy for systems etc. if that is a real major concern. The system solutions are there. The question is the cost and the value proposition because as Mark mentioned, the fact that the doctor can't see a record right now, are they able to still provide services, especially if they have electronic health information, maybe they're missing a lab, maybe they're missing the X-ray. I do think it will be much less than it is now when a patient shows up and the lab's not in the medical record. Or the X-ray's not in the medical record. Or the latest information about their medications are not in the medical record because we don't have more real-time information than we do.

Thank you. And here's a policy question for both of you. Would private financial participation violate the Stark—these are the antikickback laws, I'm assuming—due to the RHIO supporting and supplying a specific type of solution, specific technology?

You want to start, Tony?

Could you read that one again? I want to get exactly the angle they're acting about on Stark?

Sure. Would private financial participation violate the Stark law due to the RHIO supporting and supplying a specific solution or technology?

It depends on who governs, I think, the RHIO. If the RHIO is separate, then a hospital or a health system could invest in that RHIO as a separate entity but if the RHIO's run by the hospital itself, you'd have to get a Stark lawyer or somebody who knows the law well enough to know that –if

that's still covered by the – the amendment that allows hospital systems to now invest in health information technology. But I think if the RHIO's separate from the hospital system, I don't think it's a problem.

I agree and in particular, there was even before the revisions of the Stark law, there was a so-called community exception and as long as you're making this resource available in an equitable fashion across the community, I think as Tony described, an independent RHIO entity is a perfect vehicle for channeling funding for those – or if this is.

Okay. Thanks. Back to thinking about start up and design. How did you –when or how did you get providers involved in the early design of your systems and what incentives, whether financial or administrative, are there for different providers to continue to participate in an HIE? What are their start-up costs and their recurring costs?

I can talk a little bit about our model in Indiana and that is the way that we engage providers is very simple, is we talked about the patient. All of us are interested in getting better care for the patients and as we worked through the issues and challenges in the community, that's exactly where we always started and we always ended up, was what's the right thing to do for the patient. And that's what brought providers to the table. Now we had to do that and overcome them. To barriers, you know, other things going on, costs and so on, we have, as we started the work, we were able to provide some small funding offsets for direct costs like hardware for, as we were starting out to make routers compatible, you know, somebody had bay network routers and somebody else had SYSCO and it, back in the '90s, it was hard to make all that stuff work together, especially when you're doing virtual private networks and so on. And so we were able to, through some federal funding, to offset some of those costs. Today, those sorts of things are not an issue and providers pay their own costs for building interfaces and so on.

The only other cost they pay, though, beyond that are for whatever services they get of value. So, for example, a hospital who chooses to use clinical messaging for their results delivery pays a per-message fee for that service and then they save the cost of delivering it themselves.

Other services like the public health surveillance work for laboratory results and disease outbreak based on the symptoms of patients presenting to emergency departments are done at no charge, as a public service, but when public health does have some funding which they sometimes do that they can contribute, they may make that up.

So the participants basically pay for services in our model, not to be part of the health information exchange or that sort of thing.

Tony, do you want to add anything to that? Or maybe address this – another question about provider resistance at the beginning and how you dealt with that?

I think it's important in terms of Medicaid. Now, again, every state's in a little different position but I think there needs to be a recognition that providers who participate in health information exchange, where no health information exchange currently exists, need to have either reimbursement upfront because it is the payer who will gain in savings and you need to gain share with your provider community for participation because the greater participation you have, the greater the benefit to the Medicaid agency.

So, whether it's in an adjustment to the reimbursement, whether it's a pay for participation in the health information exchange, I think every large Medicaid organization has to realize that you're going to have to provide the providers with some financial incentives or financial reimbursement so that they can invest in the time and effort to participate in exchanges. And then by getting widespread adoption and connectivity, you will see the benefits in your savings, in your lab, your pharmacy, your emergency room visits. The support of the medical home. And that's, I think, very important as why Medicaid has to be willing to help providers through this transition.

And I agree with Tony completely on that. One of the interesting challenges we found in these 2 questions relate is in engaging providers as soon as you bring payers into the mix, including Medicaid. I mean, usually Medicaid's pretty safe but as you're starting up and engaging providers, if you bring commercial payers into the mix, it can get very dangerous. They can view it as, you know, what's the angle, how are they going to take us over, how are they going to use this against us. And so there's an interesting vehemence at the early stages to engage providers and patients and employers and then bring in payers and health plans at the right moment in the right way.

Great. And Mark, that leads into another question about could you please elaborate a little bit on how pay-for-performance is constructed and applied?

Sure and again, that's a very long topic but a couple of points for us.

First of all, it's important for us to bill those in multipayer approach. It just doesn't make good sense for people to invest in preventive care that's not going to benefit the plan for 5 years. Things like that, by having a multipayer approach, you get the community benefit. It's kind of like herd immunity or immunizations, you know, you need everybody to get them to – for them to really work well and so multipayer is very important.

The other reason multipayer is important is to have sufficient numbers of patients who are benefiting, able to bring revenue, pay for performance to the physician's practice. If they succeed, if you only have a handful of patients, you know, Medicaid for example, in many states provides quality improvement incentives of various kinds, but if it's only 12% of my patient population, it's hard for me to really focus on making that improvement but if 75% of the patients in my practice are in a program where I see a potential to benefit, now you've got my attention. And so that same challenge is true for WellPoint, you know, for United Healthcare, for Medicare, and acting together is terribly important.

The second thing that was very important for us besides multipayer was the emphasis on improvement and not just high performance. I think a common—I think it's an error—and pay-for-performance program is to set some bar and say you've got to get 92% and then you get incentives.

And the problem with that is, for example, clinicians who practice in disadvantaged areas may have a large proportion of patients who are unable to be compliant for various reasons, for transportation, can't afford the copay, lack of education, lack of access to the telephone and the Internet, things like that, you don't want them to be disadvantaged. In fact, you want to reward them for their improvement efforts and so constructing the incentive model in such a way that

even clinicians who are below the average, if you will, that are improving, should see an opportunity to gain incentives.

Third thing that's critically important is to keep the emphasis on the patient quality. It's all too easy to slip into this is all about saving money and generic prescribing and things like that. Keeping the emphasis on quality has been hugely important in keeping the engagement of clinicians, patients, and employers in moving this forward.

And then the last thing is making sure that the incentives are meaningful and delivered on a reasonable time frame. In other words, we deliver reports to physicians on a monthly basis. There may be 30 days at most lagged and it's very important because otherwise you're driving in the rearview mirror. You know, if in September of this year, I get some incentive for what I did in 2007, that's not the most effective change so making it timely is very important as well.

Great, thanks. Back to some questions related to patients. For data uses other than direct treatment, are there additional patient consents and/or notices that are required? And will family history information be shared with family lineages such as things like genetic deformities, chronic illnesses, and so forth?

Well, I can just suggest a way to approach. Again, every state is different because they have statutes that have specific protections on certain information so making a broad statement may be problematic but I would say this. Using common sense on what needs to be shared and under what circumstances, I think, is very important. This is why you need to have a governance over your standards, you need to have transparency into that so that patients know what is being shared. You know, I can foresee in some states that are very sensitive, information around genetics, in other states, it may not be a problem at all.

As it relates to secondary use of data, I think you should always get consents of your patients. If you aggregate the data up so that you can't determine any individual and it meets the HIPAA requirements, certainly the Medicaid agency has, in times past, shared data so that it helps with policy development with universities, etc. So they can look at data but usually those have a business associate agreement that allows that to occur. So, I would just say that initially we have to look at our own laws in our states that determine if there are barriers but we should also use common sense and always think about the patients' rights to confidentiality and protection and try to create guidelines and standards along those lines.

We take the approach and most of the use of our – that we make of the data are explicitly covered under HIPAA for treatment, for health care operations, or for IRB approved or an automized research. Clearly, if there is research that an IRB would require patient authorization for, we pursue that. And first, there's due public health exemption so we actually constrain the use very carefully to those that are permitted by HIPAA and about which the patient is notified at the time that they're presenting for care.

Great, thank you. Here's a pop quiz. Other than Indiana and Arizona and Florida, are there any other state consortiums working together on HIE efforts?

Rhode Island, New York, Minnesota, Wisconsin, California, New Mexico, you want me to keep going?

You might need to send a follow-up around to folks. I'm sorry, did you say there's a place where somebody could go to look for this?

I'm – consortiums and collaborations, I don't know if there's a specific list of them but they're the ones that I'm aware of.

There probably is, I was looking for the Web site here, there is a state-level HIE group, health information exchange group which is at www.stateRHIO.org which is one group, one collection of those folks.

Oh, okay, that's very helpful. Again, that was www.stateRHIO.org?

Yep.

Great.

I would point out, this – some states have created a public private partnership as a nonprofit to direct the deployment of health information exchanges even if they have multiple RHIOs. Other states have allowed the market to drive it or they've had integrated systems that have developed RHIOs. In some – in a few cases, they've actually created an authority to take responsibility for, that is a kind of one-step-removed quasipublic organization so each state is approaching the collaboration a little differently.

Okay, thanks. Another – another one of our attendees asks if there was a way to provide some additional information. Some, you know, any of the documents and background from your presentations and so I'll think we'll work with RTI to see if we can pull some of that information together. If you have some references, basically, that you used to generate your slides so we'll follow up on that.

I would say to the audience, that the CBO report, although.

Congressional Budget Office report?

Yeah. They came out with an excellent report in this area.

Yeah, and that's at CBO.gov for folks who are looking for that. Let's see, what else. The – here's a question and I think it is really geared toward in-home services but would it be possible to require providers per their state contracts to enter data for Medicaid prior authorizations? Tony, do you want to start that one?

Again, the technology and the functionality certainly can be configured to do that and I think it's a great opportunity to improve efficiency.

One of the areas that I know is similar to that is e-prescribing where you can embed prior authorization requirements into the information given to the physician at the point they're prescribing a medication and it will give them an alert that this requires prior authorization and this really reduces the hassle factor not only to the physician but to the member, the patient who shows up at the pharmacy and then finds out, oh, no, we've got to get authorization.

But the tool and the ability to provide this kind of functionality, I think, is very important in terms of reducing physician hassle factor. Where it's a little complicated, is if you use managed care organizations and Medicaid where you have multiple organizations, you have to then write some kind of – you have to develop some kind of way to provide that information through that managed care organization and then back to the physician. Some health plans have done that already but if you're going to do it in kind of a one-operate or one-functionality, it would require some work in terms of developing an application.

And Mark, did you want to add anything to that.

I agree.

Oh, okay, you agree. Okay, well, we've just – we've got just about 5 minutes left and I'll just check with folks, it looks like we've got one last question here. It's kind of a political question so I don't want to lead you down the path too much but we have a question as to whether or not you have any opinions you'd like to share on the upcoming elections and how the outcome might change funding models related to Medicaid and SCHIP.

Mark, do you want to start?

I actually have little to offer in that space.

Well, I will say this. Both candidates have identified electronic health information and support of the financing of electronic health information as extremely important to reducing costs now and in the future, avoiding future costs, and reducing the medical costs inflation that we see. So I think both candidates have come out very clearly that they would support additional investment. Now, it's not clear as to how that would translate into bills or initiatives but I do think there's been a recognition that electronic health information and this infrastructure is key to the American health system transforming itself.

Okay. Wonderful, thank you. I just want to take a minute here to solicit any comments or recommendations for future sessions. We'd love to hear from you as to what burning issues are – you're encountering in your day-to-day lives and the way to best let us know about your thoughts on that is to send your comments or recommendations to the email address that we've set up for this project, which is Medicaid-schip-hit@ahrq.hhs.gov, for those of you who are on the Web access line, that's on your screen there.

And looks like we don't have any further questions for the panelists today so I would just like to extend my thanks and gratitude to Mark and Tony for wonderful presentations and just ask if either of them have any closing comments that they'd like to share with the group?

Just thanks for your time and want to make sure that everybody recognizes how much we appreciate our state's Medicaid program support and participation across all of those different efforts that I talked about. So, glad to try to follow up as we talked about and hope everyone has a great day.

Yeah, I just want to thank you for the opportunity to talk a little bit about where Medicaid is and where it's going.

Great! Well, thanks everyone, and thanks to the participants who stayed on the line and for your very thoughtful attention and comments and we'll hope to see you next time. Sign up for the listserv so you'll find out about our upcoming webinars.

Thanks, everyone! Have a good day!