Audio begins on slide 6, bullet 3:. Thirdly, as an individual, as a patient, that whole concept is for you to be able to have the information to better manage your own care and health.

And then lastly, there's support of health information exchange. We can bring information on to public health, emergency response, research opportunities, quality and other third party users of the data in an appropriate, confidential, and secure fashion. So that's what we're all about and in order to get there, we need four major components.

We clearly need the HRs and that's what we're going to be talking about today. And just to be clear, this is the record that the provider, the clinician, the hospital, creates in order to store and import information in a comprehensive way. There can be patient portals on it where a patient can get to their information and communicate with their doc but it, the EHR literally belongs to the delivery system and is controlled by the clinicians.

The PHR, on the other hand, is a record where individuals can store and create information for themselves and they can control that. Clearly what we need is to have the communications between the two and that will require the term that we call interoperability so information can be exchanged in an easy way.

Health information exchange, though, is more than just about interoperability and standards because that's what you need to get there. It's also about moving that information in multiple ways to assure that the appropriate authentication and authorization processes are in place and that the right patient's information is in fact being moved.

So, health information exchange, third big component. And then lastly we talk a lot about the national health information network and that's another set of standards and specifications which will allow various organizations that are engaged in health information exchange, whether it's a state or whether it's a org—an organization of pediatric hospitals or the VA—to be able to exchange information with each other.

So those are the four big things and now I'm going to get right down in the next slide to EHRs and EHR adoptions, where we are, what's going on with all of this, with the hope that ultimately this information will help you think through how you in your own Medicaid situations or how different Medicaid populations can benefit from this.

First off, we don't have very good rates at the moment. You will hear that there are some studies that say that it's up to 28% but in those situations, at best we really have no idea what they mean by an EHR. If you standardize the definition to something really basic, and I do mean basic, that all it is is electronic note keeping, the ability to order both labs and meds, and the ability to get lab results back, then you find out that's only about 14%. And only 7% of fellow docs have that capacity.

Clearly, if you're in a larger practice, 11 or more, the prevalence goes way up to 28% and certainly is much higher in the metropolitan areas because there are a higher degree of larger practices in those metropolitan areas. And unfortunately, I know I'm going spend more time here on physicians but the state of adoption among hospitals really isn't any different, size matters, same as in the other situations and the one thing that's interesting here is even if a hospital does have a full implementation, that doesn't necessarily represent full physician use. Very frequently,

you will have a full implementation but only a fraction of the docs are actually using the EHR there.

One thing I would like to underline before we go too much further is the fact that again, when we're talking about EHRs, federal government has, is very clear that it's talking about what are now have become certified electronic health records so I want to take a few minutes to talk about the certification commission for HIT.

It was founded in 2005 as a multistakeholder public-private partnership and has developed very extensive criteria for the functionality, security, and interoperability (i.e., the ability to transfer information from one product to another). These criteria are presented to the secretary, accepted by him, and then are used in the certification process. The very first certified EHRs hit the market in 2006. Those were ambulatory for use in physician offices.

Currently, several years later now, it covers about 70 to 80% of the installed market base. And over 25% of the ambulatory EHRs now in use have been certified and obviously it seems a little bit strange in terms of numbers but there are a few vendors who are certified who have a very large proportion of the installed base.

On ongoing processes that the commission is engaged includes consistently adding newer and more important functionalities to their criteria. New interoperability standards. New specialty EHRs for behavioral health, cardiovascular physicians. New setting such as ED, emergency room, and long-term care. They're moving into the personal health records phase and they'll also be certifying interoperable networks.

The next part that I'd like to share with you and we'll bring this together in a few more slides here is that we recognize that we're not starting in a very good place here with not very much widespread adoption. So in 2006, the secretary convened the American Health Information Community, which is the AHIC. That community is informed by a series of seven workgroups and there are two that have been very busy over the last two years making recommendations in order to achieve widespread adoption of certified EHRs. And that's why I went through the little story about certification first, minimizing gaps in adoption among various types of providers and also another workgroup called Consumer Empowerment were making, have been making, recommendations on widespread adoption of personal health records as well.

The areas of focus for both of these and actually some of the other workgroups really are these five: what's the business case, what are the technical considerations, what are the privacy and security concerns, medical-legal issues that need to be addressed, and when you come right down to it, as we fondly say here, culture eats technology for lunch: you really need to understand the organizational cultural issues that are required to do this kind of a change.

Let me just start off by very briefly saying that everybody I think is in agreement that the biggest barrier for widespread adoption is the cost and the cost specifically to the smaller physicians' offices. We go with a figure of about 20K per user for software installation, loss of productivity, with the hardware being additional. It's a very, very squishy number but it's one that seems to be quoted quite a bit and recent findings suggest that there's really no financial ROI, return on

investment, to the physician providers in today's environment who make this type of an investment and that most of it does accrue to the payer so this has become a huge barrier.

We have in the federal government, tried to address a number of enables, though. One is the certification program which I've just told you about, you know what you're buying when you buy a certified EHR so it decreases the risk of a failed investment. Secondly, the Starke amendment and antikickback relief now allow hospitals to donate certified EHRs to physicians so I'm going to underline certified again there.

Third, you're probably aware of the fact that HRSA has been granting monies to rural and community-based federally qualified health centers in two directions: one to help them actually purchase an EHR and secondly, to help them understand what it takes to go through that process and make that implementation as—I won't say any less—but as pain free as possible.

And again, this is for certified EHRs. A number of malpractice carriers in the country are offering free credits for physicians who have adopted certified EHRs. And lastly, perhaps most importantly, you will be hearing next week from the Secretary of Health and Human Services, Mike Leavitt, about the demonstration project that CMS is moving forward with. And this is based on a number of programs, similar programs in the private market that provide incentives for the adoption and effective use of EHR functions and then ultimately provide the incentives for the improved performance that will come on specified metrics because of the EHRs themselves.

As I said before, the announcements will come next week. We anticipate that there will ultimately be 12 sites which will be studied with respect to this and the remuneration that will come from this is actually quite significant. So, the business case barriers are slowly beginning to come down. We still have, however, some technology barriers on this next slide.

Usability and functionality are two of them. Yes, the certification process guarantees a huge number of functionalities are there but when it comes down to usability, being able to see your information in the way that it's most useful to you, and the ability to incorporate, for instance, registry functions in your EHR, these—and to have really good clinical decision support so that it's not intrusive and works with your workflow—are three very specific areas that the vendors are now working on and hopefully will be in the certification process soon. But they're not there yet.

I think one of the other problems we run into is that very frequently, vendors do an implementation and attempt to automate the paper process. Frankly, that's exactly what you don't want to do. Your paper processes were designed for paper. Now you have electronic information flow. Think how you can provide care more effectively and efficiently using a whole different set of processes.

As I mentioned before, this concept of interoperability where information can go easily from one point to another has been very big. Up until this point in time, some EHRs come with maybe one or two interfaces but then it can cost $5,000 to $10,000 more for each additional interface, to another lab, another hospital, and each one of these are a one-off and that's why they're so expensive. With interoperability, that cost dissipates.

And also, we're also hearing about new updates and enhancements from technology and that's a bit of a barrier, too. So I've already talked a little bit about some of these enablers and am not going to spend as much time on this slide as perhaps I would otherwise, but these issues of clinical support, that organizations are going to be important moving forward. And I would like to make one point here, though, and to call out that I am, that there are some programs right now and there's one in New York City—Medicaid program in New York City—that's been working very closely with a handful of vendors to really ensure that these functionalities have been implemented and the EHRs that they are supporting and helping to reimburse for or helping to pay for in that particular program because these are absolutely critical.

I've already talked about the harmonized standards coming forward, we need these interoperability standards and we also need to develop a lot more in the way of health information exchange that's more than point to point. It's all well and good when I'm seeing a patient to be able to go directly to one lab but if I need to go to two labs and three physicians to get lab data, then it's difficult to do that on a one-time basis.

Health information exchange can occur through organizations that can oversee exchange through a central body so that it's very similar to when you call someone up on the telephone.

And then, lastly, we need to find out how to do quality reporting better, how to look at quality better within the technical capacity of an EHR so that it can be easier for the physician or clinician to practice the way he or she would really like and also for reimbursement purposes.

Moving along to the next really big area, which is privacy and security, I think everyone would probably agree that there are issues here. The question is, who controls the information and flow? Physicians are very concerned about that. What are the consequences of any breach of information to some of their patients, loss of insurance, work, or other forms of discrimination? What happens with what we call secondary uses of data when information is de-identified or not identified and then used for secondary purposes?

I think most people are very comfortable with public health and research, I think people are less comfortable with marketing and a few other areas and then, lastly, there's this big area of genomic and family history which doesn't just affect the person or the patient that may be being seen but his or her family as well.

So, there's a lot of work in progress right here. We have a lot of standards developing right now—for authorization, authentication, how to identify a patient, proof that that's the patient, principles and policies for secondary uses of information—have come forth in the last six months from NCVHS and just, I think, three or four weeks ago, Congress finally passed and the President signed the genetic information nondiscrimination act so there's now protection from discrimination against genetic-based information.

You're all familiar with HIPAA, the Health Information Portability and Accountability Act, but what you may not know is that it is fairly limiting with respect to what it covers. Clearly everything in the delivery system and everything related to the health plan's need for information and their business associates (i.e., the work that they delegate to other parties). But, it does not

cover, for instance, information going through a health information exchange organization, does not cover information in any type of an online personal health record.

So, there is right now a need for a more robust set of principles, policies, procedures, and protections for all forms of electronic health information use and exchange and that's being worked on very intensively as well.

Last, I mentioned a little bit earlier, about the cultural and organizational concerns, what I'd like to underscore is there's a very limited workforce out there, not only to develop these products but to help the delivery system through the implementation process, educate them on how to use health information most effectively and to do research on health information technology, so there's really a big dearth here in terms of limiting our ability to really move forward the way we would like. We're trying to address that in health as well.

Leadership is a very big one. You have to have at least one person who is clear that this is important and is willing to make it a major piece of their work to bring others along. In any type of a HIT environment, whether it's in a physician's office or whether it's in a care environment, someone has to really own the fact that HIT is going to be important.

Staff redeployment is another big issue as you bring in health information technology, you will be using your personnel differently. It can be very trying for a number of people who have to retrain themselves or who may have to find employment elsewhere.

And then there's a very big concern a lot of organizations have right now about what constitutes a legal EHR and the liability associated with that. Imagine for a moment that you're a physician who is seeing a patient for the first time and you have established your record of that patient and the next time you see them, they bring in probably the equivalent of three inches of information that has come in from five or six other sources. How much of that goes into your record, how much of that now becomes part of your legal record, if it can all be brought in and incorporated into the records so these are issues that are being dealt with by quite a few people right now, particularly the American Health Information Management Association, or AHIMA as we like to call it.

And then in addition to staff redeployment, clearly all of this is going to be redefining patient inclination rules as well, as patients become more and more engaged in their own care. So, trying to keep on schedule over here, I'd like to just share with you a little bit of a peek into a close, close distant, close, not too distant crystal ball because we're going to be seeing over the next couple of years a lot more expanded interoperability. Today, we can do eprescribing. By the end of this year, the certified EHRs in 2008 will be able to share some very critical information: (a) laboratory data; (b) they'll be able to do eprescribing; and (c) and this is I think the real take-home that you'd be most interested in is that they will be able to share what we call the clinical care documents. That is a little bit different than the CCR or the clinical care record in that it has a slightly different set of standards that ensure its interoperability, but it is a summary document of all of the critical elements that need to be shared among clinicians who are trying to provide coordinated care for a given patient so the concept is that this CCD, and that is a technical term for it, the clinical care document, will now be incorporated in an interoperable form in all EHRs from 2008 moving forward and PHRs when they come on the market so that any PHR, EHR that

is interoperable or has incorporated these standards and is certified will be able to share information with each other so this will be a huge advancement forward for really getting important information to the people who need it most.

Another big step will be the ability to prepopulate both EHRs and personal health records. There's a huge amount of electronic information that's already out there. You know because you see it in claims. It exists in laboratories. It exists in the forms of all of the medications that we have so if we could prepopulate electronic health records and PHRs with this information and of course, it would all have to be interoperable and standardized, most of it already is, then it would be a huge step forward so we see that coming, coming in the very near future as well.

The issue of how information exchange, I touched a little bit earlier. One can have point-to-point, and then the multistakeholder health information exchange organizations can then have these big switching stations or whatever where, where data can go into the exchange organization and be directed to wherever it should be. I think in the beginning, we're going to see a lot more of point-to-point information exchange, one electronic health record to another, even if it's just the clinical care document. Or possibly even a personal health record and an electronic health record. It will take a little bit more time before that information actually can flow through these health information exchanges because frankly right now, they're still trying to establish the best business models in these areas. There are about a hundred and some of these out there right now, only a handful are exchanging any type of clinical information at the moment.

So, with that, I will allow all of you to either ask questions now or maybe I should ask that of Erin or whether we should move right on to David and we'll take questions at the end?

Ahm, actually, we've got Marco Gonzalez has a couple of questions and so let's not spend too much time but maybe we can sort of answer his, I think they're fairly quick questions, so, does this lack of interoperability, for I'm sure referring to one of your slides, include connectivity with payers?

Yes. Yes. There, at the moment, there is no connection, there is no interoperability between the clinical information in an electronic health record and a payer.

Okay. And then the other two questions I think are probably a little bit longer so let's go ahead and have Dr. Patterson talk and actually you may end up, Dr. Patterson, answering to some degree some of Marco's questions as well, so, we look forward to your presentation. Thank you.

Yeah. Thank you, and I think, if I can answer them, then I can at least shed a little light and maybe take the discussion a step further.

My presentation is a little different from Dr. Bell's as was introduced earlier. Because we're focused, in South Carolina, we're actually focused on the concrete. We have a health information exchange and a combined EHR that are being delivered currently. They're in pilot mode also exchanging clinical data in six counties and at least a Medicaid claims push to EHR that would be deployed to all Medicaid-enrolled primary care providers in the state beginning July 1 is already underway and we've sort of been working in the space for just a little while. So, as I go through my presentation, I would like to give you sort of three overarching themes to think about

and some of the definitions may be a little at variance with what Dr. Bell said but just kind of keep these concepts in mind.

The first is an electronic health record, EHR, versus an EMR. Increasingly I see them used almost synonymously but from our perspective, having worked in this area, sort of on the ground since 2006, we view a CCHIT-certified system that go (inaudible) clinical system that would interface with the practice management system in a provider's office as an EMR. That's an electronic medical record, reserving the broader EHR for the combination of information that can be provided at the point of care from multiple sources so again, that's a slightly different flavor and my presentation will focus on the interoperable combination of data at the point of care so when I speak of an EHR, that's the precise definition that I'm following.

Second, you know, based on that definition, interoperability in the exchange is very important in creating a true EHR because a person's health record will span multiple providers and so to get that common view and the continuity of care, you actually need to move data. The last thing that you're going to see, hear me speak about and again, Dr. Bell's already raised it, is the utility of claims records in starting this process, either as seeding—a way to seed EHRs as a substitute for clinically deep EHRs to give value to providers right at the outset, a way to assume—essentially jump-start this process. So those are three things, please, bear these in mind as I talk through the South Carolina experience.

So, before I do that, let me tell you very briefly part of what the South Carolina experience involves is a rather unusual organization and that happens to be my organization. We've been in existence for about 30 years and we're a neutral service agency in the state with no program, no programmatic responsibilities. We're statistical and research focused; we also have a software development shop, database administrators, the kind of mixed skill set that Dr. Bell was referring to as an entity that can kind of move things forward. Also, that neutrality in the fact that we've built up relationships over time by acting as stewards of data rather than the owners of data helps to overcome a lot of the cultural or sociological or organizational resistance that was mentioned in the previous presentation. We've got a trust relationship not only with most of the state agencies but also with the private and nonprofit provider communities. So, in a way, we can act as sort of a central coordinating body or convener as we move towards governments.

One of the things that's unique about what we did in South Carolina is we leverage an existing data warehouse that has been built over the 30 years of my organization's life. And this sort of speaks to the question from Marco Gonzalez: we've overcome the connection of legacy silos ourselves by collecting data from legacy systems—from both state agencies and the private sector—creating a unique identifier that can be used initially for statistical purposes but now we have the clinical version through a partnership with a private-sector company that actually maintains that sort of patient linkage that's so critical to moving data around. Again, we pull demographics off unless they're needed and as I've said, the data is always owned by the originating agencies. We have literally multiple laws that set out not only our authority to collect it but also the rules that we have to abide by, the protocols for release, etc., so all of this in the case of South Carolina is fairly well established although as Dr. Bell mentioned, the movement of electronic health information introduces numerous new twists to this that constantly have to be addressed through regulatory process or through MOAs, agreements, etc.

Just to give you a sense of what we started with, our approach was different, we really began with claims data. What you're looking at is a schematic of the holdings of my office which are integrated through our unique ID process. In the state of probably greatest relevance here, you'll see in the lower left, I mean lower right corner, we receive all data from the Department of Health and Human Services in South Carolina so we have all Medicaid enrollment and eligibility information, all Medicaid claims, those date back to approximately the mid-1990s and if you'll also look along the bottom edge, by law our state is also the recipient of all UV9204 billing data from all of the hospitals, emergency departments, and ambulatory surgeries in the state. Again, the permission process surrounding the use of these data is very well defined and we're engaging the hospitals now and have had positive responses thus far for the inclusion of all UB92 in the EHR and HIE—health information exchange—process that we're engaged in. So what's unique about us is we really began with a central repository that was primarily claims-based and that's something that's important to bear in mind because again, I'm a true believer that claims may be a good place to start.

We really began doing HIE and electronic health records probably about 2005 and we did this solely with claims data. So we call this the Medicaid EPHR system version 1.0. You'll see when we get to the current version that it's actually now moved towards a full-blown federated HIE model for moving the data around but again, since many Medicaid agencies are really starting at ground zero, I include this so that you can see just what you can potentially get out of the claims data themselves.

And what you're seeing here is a screen shot of the earliest version of a Medicaid EPHR that we developed for the Medicaid agency in South Carolina. Many of you are probably recognizing that this looks remarkably like the main screen on the VA-Vista system which in fact did guide our design although we rewrote it in a different language because the architecture of Vista is pretty specific and narrow and it's harder to find developers in that area but you see just in this case, we were deploying 12-month rolling history based on claims data that would include a lot of the things that you would want to see in an EHR: the diagnoses which gets you towards the major problems, medications which we receive from the Medicaid agency, clinical procedures, the eligibility information which is down because the real-time connection wasn't an existing one when this shot was taken, also the ability to capture postings and notes from the physicians.

We piloted this particular approach to doing a claims-based EHR back in late 2005 and into 2006 with five provider offices around the state. And when we concluded our pilot, we gathered everyone together and held focus groups with the providers to determine what we had gotten right, what was missing, what would they like to see. Their immediate response was, well, there are a couple of things that are missing.

First of all, we really would like to see reference labs or lab data and that of course, moves us away from something that can be done strictly with Medicaid claims. The second thing that they asked for was a connection to the immunization registry that was maintained by the health department in South Carolina which again would require some kind of bidirectional interface rather than just a movement of claims data from our warehouse to the point of care.

This made us shift our thinking towards a more federated model and at that point, we actually began looking for ideas and that led us to a phase that began in April of 2006 which was called

the HIE Headstart. The participants in the initial HIE Headstart was a nonprofit consortium based in the Charleston, South Carolina, area known as AccessNet, of course. ORS in the South Carolina budget and control board and then we responded to an RFP from a private-sector company based in Ann Arbor, Michigan, called Care Evolution which is a niche HIE architecture provider and they're basically a boutique company that specializes in this. And we actually had a reverse process where they put out an RFP, we responded because they wanted to work with a large claims repository, they actually funded us to offset staff costs and together we began building the core network services that would become part of the HIE in South Carolina, ultimately would be called SCHIE, South Carolina Health Information Exchange, and through that federated architecture, would populate a user interface that would be a true longitudinal EHR also capable of including clinical data pulled from CCHIT-certified EMRs as well as from other sources such as reference labs and the immunization registry that I mentioned before.

Our approach was to leverage the existing data warehouse and to engage in partnerships in funding and development.

Phase 1 of that project which began in July of 2006 and concluded January 1, 2007, again focused on two things: one is a core network service known as a record locator service. You can think of this as an electronic master patient index. And we use the extensive data holdings of our warehouse to build this RLS, which is one-way hashed, blinded, and encrypted. It covers over 4 million residents. In fact, since we used longitudinal data to build it, it actually covers 6.1 million individuals and then through the Medicaid agency which was again already a partner with ORS in developing an earlier version of this as well as through the process of that approves release of the UV92 data, we included a 10-year longitudinal claims history of all encounters for Medicaid recipients as well as all in-patient, ambulatory surgery, and ED claims. So as a result of that, before we even began rolling out our version of an EHR and a statewide HIE, we had the ability to deliver at least diagnoses, procedures, and for Medicaid recipients, prescription history. This also, by switching to this platform, allowed us through a federated service-oriented architecture, to pull clinical data from provider EMRs, to tap into reference labs through various private sector partners, most notably in our case, LabCorp, and also to develop an interface, bidirectionally, with the health department's immunization registry so that as immunizations were captured in connected EMRs, the registry could be further populated. Likewise, anyone using our viewer would see the complete history of immunizations from the department of health.

And we have some guiding principles as we did this, and I'll go through this very quickly but we followed from the very beginning, the marble foundation model which pointed us to a number of domains that each of which required an extensive amount of work. But this was sort of the framework or approach that allows us to come to grips with questions such as legal state safe harbors, relationships between hospitals and primary care providers, of course, questions concerning privacy and security, of course, questions concerning infrastructure, etc., adequate linking and so on, so many of the questions raised by Dr. Bell, we address by simply working through this framework and thinking about them in our concrete context.

There were four notable key design principles. We wanted to build off existing systems and create early value for patients and doctors, we wanted to leverage both a bottom-up and top-down strategy in development and I guess the state being the top although honestly as a research and support unit, you really don't feel like the top of anything but I guess technically the State of

South Carolina was involved. Everything that we did was designed to safeguard privacy, again, we can go into numerous details via questions, if you would like in terms of the specifics that we get here and also build upon an interoperable, open standards-based network of networks, again, following the guidance of many of the organizations mentioned by Dr. Bell, if not all of them.

Essentially, the new platform would work as follows: patient arrives in Clinic B, Clinic B would then send a message to our core network services hosted here at the Office of Research and Statistics, our record locater would return a list of locations with records for that patient and also return a 10-year claims history for that patient. At that point, Clinic B contacts peer organizations and retrieves the clinical records, so even though we are starting with a central repository in leveraging the claims that we hold, ORS has no desire to hold all of these clinical data, we understand both the business interest, privacy interests, and so on that would potentially be compromised by that so we opted very clearly for a federated model as we moved our electronic health record and the exchange that populates it out.

One of the first things that we then needed was an actual live pilot and this is underway now, in fact, as of last month, some of our entities are actually using this for clinical use, it's already been put through strawman's etc., but it was the first live pilot of our infrastructure and also as they worked through the various issues with us, a lot of work was done templating, policies, etc., that could then be pushed forward to ___

SPEAKER GOES AWAY

We can't hear you anymore, Dr. Patterson.

He was disconnected on his end.

Oh, he got disconnected, okay. Hopefully, he'll be back with us then in just a minute. He probably has to look up the phone number.

This is Karen Bell, maybe I'll just jump in for the moment until he comes back online again.

Great! Thank you!

One of the things that he has just talked about is the difference between an EMR and an EHR and I just want to underline the fact that we have no arguments on this whatsoever! Certification commission includes interoperability in its certification processes so if it's a certified EHR, it has interoperability standards built into it. The difference may be that the interoperability standards certification commission uses are those that are approved by the secretary and are also the same set of interoperability standards that everyone in the federal government has to use so that there can be communication, again, between providers in any area, in the VAs, the GOD, as well as others. It's a national set of interoperability standards but we're absolutely in agreement that an EHR has interoperability baked into it.

And this is Dave Patterson, I'm back and I apologize if Dr. Bell had a government issue presentation, I have a government issue phone and it's state government so I do apologize.

Great, she was just picked up on a point in your presentation, really, to, you're talking about the difference between EHR and EMR and basically was agreeing with you so we're ready to go right back where you left off.

Okay, thank you very much and again, I do apologize so again, I was speaking about the Lakeland's Pilot that again, we've already been through Lakeland's Rural Health Network to tell you who they are, it's a six-county area and the shaded portion of South Carolina. They have one 400-plus bed, regional hospital, self-regional, as well as three much smaller rural critical access hospitals as well as 20+ other providers, most of them ambulatory or all ambulatory, they include the federally qualified health clinics in that area as well as some private practices, some affiliated with self-regional hospital, some independent, so at a pretty broad provider base, in order to actually first deploy and test our architecture and now we're actually in a live pilot for clinical use which we hope to evaluate in about six months in order to get feedback from both the providers and the patients.

As part of that process, Lakeland's has a clinical leadership council that had performed their own evaluation first of moving to certified EMRs and this would again from their perspective, extend even further as we have the HIE-driven EHR in place. But again, these go back to some pain points that potentially can be remedied from their perspective, operational effectiveness and business impact would be held or have been held by referrals, precertifications, co-pays and collections, assistance with dealing with records management, prescription management, prescription management, risk management, and again, from our perspective and theirs, the most important area is the efficacy and safety or clinical impact of what we're doing, timely results and notification, and in the patient phase, the ability to build in patient reminders, health history for new patients, emergency care, particularly when someone's nonresponsive and you have no history on them, etc., and also hopefully to increase patient satisfaction and ehealth in general.

At the same time, we move the Medicaid EPHR project onto the same platform. So, they are participating in the same policy development process as the Lakeland's Rural Health Network and that participation is actually expanded to include detailed discussions and support from the South Carolina Hospital Association, detailed engagement by Health Science of South Carolina which is a consortium of our three largest, four largest hospitals as well as the Medical University of South Carolina, USC, the University of South Carolina proper, and Clemson University. They're part of our stakeholder group as well as the South Carolina Primary Care Association, the South Carolina Rural Health Association, the Free Medical Health Clinic Association, and so on. So we're already gathering stakeholders together and having a dialogue and it is our hope within the next year to perhaps two years, we'll develop a statewide governance for a statewide appointment once these pilots are successful.

But regardless, the Medicaid agency has chosen to put out the HIE viewer without bidirectional connectivity as I said to all enrolled Medicaid primary care providers and that roll-out begins July 1. Medicaid's participation, South Carolina has been invaluable in forging additional partnerships, particularly with reference labs, we're concluding an agreement with LabCorp which is the largest, independent reference lab provider in South Carolina, to include their labs, quarter 3, quarter 4 calendar year this year. So we'll begin having a lab viewer and we can talk about the different solutions but the ability to submit and tab through LabCorp labs and also a viewer that can combine multiple labs into ranges for multiple sources.

And you'll, you can see that in just a minute when I go through a few screen shots here. Last but not least, again, we're moving forward with the health department's immunization registry. They have just moved the registry towards an HL7 compliant architecture and the next steps then will be for us to put an adapter in place to exchange messages between the registry and the rest of the exchange.

What is our overarching vision? This is our picture essentially of what SCHIE actually looks like and the blue sort of box in the center are core network services, they're hosted by the Office of Research and Statistics, that includes the critical master patient index/record locater service, Medicaid UV92 claims data that we deploy on behalf of all participants, connectivity to the immunization registry, connectivity to LabCorp reference labs.

If you look down the right side, you'll see regional networks and you'll notice that they have plugs. Those plugs represent bidirectional connectivity that is produced by placing an HL7 adapter that can speak to the exchange in contact with a certified EMR or a hospital ADT system, a hospital lab system, hospital image system, etc. We've had some discussions with Georgetown Hospital and are moving towards engagement with them for bidirectional connectivity. Similar discussions are underway with the Medical University of South Carolina in conjunction with Health Sciences South Carolina to provide bidirectional connectivity there, and then, the actual, this slide has a little data, the actual plug at the very bottom for the Lakeland's Rural Health Network is actually connected at this point.

On the other side, you will see applications. At the very top, we've had some initial discussions regarding potential deployment to EMS and first responders and also to disaster management officials, South Carolina being a hurricane-prone state, also with increased concerns in terms of homeland security, etc., we wanted to engage in discussions to develop the appropriate policies for use by those sorts of entities in the events of an, in the event of an emergency.

The second facet is actually the Medicaid primary care providers that I described before which are now moving into roll-out phase this summer, and then we have developed a family or personal health record that is lying in wait for use but we wanted to actually get some of our pilots accomplished, continue engagement of the public, etc., before we made that available, fearing that if you take too many steps simultaneously, you run the risk of creating chaos rather than a measured coherent plan to move these different features out.

So what you're seeing now is from a demo site essentially what would come up on a patient's census, I'll skip through this very quickly because I realize that I may be running short of time here, what you see now is the longitudinal history that is produced through the EHR by combining data from various sources and our technology partners have spent a lot of time working with clinicians in order to develop a user interface that gives them what they need very, very quickly but still allows them to drill into detailed information, should they need it.

So we did everything longitudinally. You'll notice at the very top that there's a timeline where you can zoom in and out in time, put as much or as little data on the summary screen as you need. You'll notice that common problems are listed at the top, problems are organized by body system. We used a series of icons to indicate the different types of encounters so again, they wouldn't have to guess whether we were talking about a hospital, inpatient or ED visit, instead,

you have a green H for an inpatient hospitalization, a red triangle for an emergency department visit, and a black square for an office visit.

You'll notice also that we do make the providers transparent to each other. You can see who else saw the patient and what the problems addressed there were. You can also literally go through the audit trail and look at the specifics that were viewed by any individual that has legitimate access to this system.

Now you're seeing the clinical viewer. This is what happens when you move into the detail on one of those encounters; you see it looks very much like a rounding chart that you would see in a facility. Again, we capture vital signs, latest status, labs can be viewed here, reports can be viewed here, and mousing over any one of those sets of boxes will return greater detail like you see there which would have been a mouse-over on vitals.

Again, you'll also see the common methodology of using the sliding time ruler at the top so that you can adjust in and out, focus broadly or narrowly, depending on what your needs are as a provider.

This screen actually shows you what the lab viewer would look like. If you'll notice on the far left, we have the ability to do time compressions so we can take labs from the individual draws that may occur multiple times during a day, particularly during an inpatient encounter, or you can actually move through a weekly, monthly, or even yearly time compression which would give you the range of labs that occurred during that period of time. And that's actually what that monthly view would look like.

We also pull notes that are derived, either from hospitals, EMR systems, these can include things like diagnostic reports, radiological reports, discharge summaries, etc., display those as text. We can also capture notes if warranted from an EMR system.

Last, but not least, this is the Web-based patient view that again has already been developed but we're not quite ready to deploy this yet, primarily for cultural, sociological, and user adoption reasons. But again the idea here is to give a more basic summary to the patient, allow the patient to share their records with whoever they choose because they may have their own informal care support network, and also to provide important information to the patient that's based upon the diagnoses that are identified through the HIE so if you see on the left side bronchitis, kidney failure, headache, etc., that's because some of these have appeared in diagnosis that we have access to through the exchange and so we simply populate that with some basic information to assist the patient in managing their own care. Essentially what does this diagnosis mean, when do you need to seek medical attention, what can you do to prevent it, etc.

So, that's essentially the South Carolina approach. We tried very, very hard to conform to the standards that Dr. Bell discussed, not just the technological standards but also paid very close attention to the HISP privacy process, etc., and we could spend a lot of time talking about the things that we've done in order to safeguard patient privacy and to make this transparent as possible but hopefully this gives you some sense of what is, what you can do with Medicaid data, even with the claims data and maybe more importantly, how the claims data can be an important

stepping stone to the deeper, richer clinical data that could be provided by a certified EMR. So I thank you for your time and I guess we can move on to questions.

Great, thank you very much, Dr. Bell and Dr. Patterson, those were both excellent presentations. And so, let's move into questions. Marco has a lot of questions so he's obviously very engaged here. But one questions, I mean, I think Dr. Patterson, you answered this question from South Carolina's perspective in terms of one role of a state Medicaid agency to facilitate adoption of interoperability, adoption and interoperability of the EHRs and you can weigh in on this some more but I wonder, Dr. Bell, from sort of a more global perspective, some thoughts maybe from you on the role of state Medicaid to facilitate adoption and interoperability.

Thank you so much, but first let me just commend David on not only his presentation but all of the work he's been doing, it really, really is in the forefront of a very creative and progressive program but to get back to, I think, the real gist of your question is there are many different ways that Medicaid agencies can jump into the fray, some as robust as South Carolina and some as basic as joining in on multistakeholder programs in other states. Just as an example, there are some states that have, take a small one, Rhode Island has a quality institute that has been looking at getting EHR adoption and health information exchange going for some time and Medicaid is a very active participant in that so the very first step is participation in any type of multistakeholder group that's really looking to the future to improve quality through the use of health information technology.

The second step is to perhaps follow the model that CMS has used with Medicare in terms of moving adoption forward through an incentive program. I think this would be particularly strong in areas where there are other payers who are at the table with various incentive programs. I'm sure many of you are aware of the Bridges to Excellence program that provides incentives to physicians to see who have various systems in place including electronic health records that ultimately will lead to better care and more widespread adoption so that pay for performance programs that are of this particular type and again, it's very similar to EHR demo, that the secretary will be announcing more about next week, could be a way to move forward.

There will be, as I mentioned earlier, 12 sites that this is happening, this will be happening. I can't divulge them at the moment but when they are announced, any of the Medicaid programs that are in those states would be, that would be a natural way to really begin to push this agenda forward in your states.

Third way is to begin to develop as occurred here an opportunity to provide information in an interoperable format to patients and then they can begin to share that information with their clinicians and their clinicians will have a bit of an incentive to want to be able to take that information in. So the, I think that that's the piece that many people are probably, would be, consider the third step in this process: getting out a, what would be called, a PHR with the information in it which would have to exist in the interoperable format, you would have to use the standards for that. And then the EHR should be able to take that information in and perhaps reexchange again so, I think those are probably a series of steps in increasing complexity that various Medicaid agencies can do to begin to push this adoption agenda forward, and of course, the final one that has been described here is probably the crème de la crème, in terms of commitment of both resources and time.

And I would just ask, if I may, presenter's privilege, also go back to Dr. Patterson and ask what the long-term sustainability model is for financing the current project?

And that's, that is one of the, the largest challenges. Right now, just like most exchanges, we've depended in part on some very limited appropriated money from the state as well as grant money, as well as funding from CMS in some cases. That is a real challenge. Some of the things that have been explored as we started out with the Lakeland's RIO were the potential of subscription fees and perhaps transaction fees.

The problem with that, of course, is that it adds to the burden for the providers and makes the business case even worse so as we explored that tentatively, we began to move away from it.

Now, as we're concluding our pilots and trying to develop a statewide governance, I think we're moving the direction of thinking towards acceptable secondary uses of the data that may generate revenues necessary to make the exchange sustainable over the long run. But I can't stress enough, at first, multistakeholder participation and that includes representation for the patient community, must be established in order to do that because you have to very clearly set the rules of the road.

However, assuming those things, there are plenty of opportunities where data such as these can be used in a secondary fashion to generate revenues sufficient to operate the exchange. Again, in our case, so much of this is riding on existing infrastructure like the South Carolina State Data Warehouse which already existed that a lot of the start-up costs have already been absorbed but, Dr. Bell, that is a huge challenge.

Thank you.

Thank you, and David, did you have anything that you wanted to add in terms of Medicaid's role, I mean, obviously you've had ___

Oh, it's been enormous in the case of South Carolina and we have had back-to-back two consecutive Medicaid directors that we are very fortunate in that they're very forward thinking individuals and are willing to push this forward so we've been blessed with a very proactive, highly engaged, Medicaid agency.

Great. Some other questions that I think are probably steered toward you, Dr. Patterson, but Dr. Bell, obviously feel free to jump in, one was for the South Carolina project, does your claims data include managed care data?

Yes, it does.

Okay. And actually, similar, I personally had a similar question in your one table that showed all of the various sources of data coming into your database, you listed Medicare and I know from an NASMA meeting I was at last year, last fall, as well as other meetings with Medicaid folks, the ability to access Medicare data, for Medicaid agencies to access Medicare data is of great interest and so I was just curious as to how you're doing that and what data you're, what Medicare data you're getting?

Okay, well, let me describe it first and then the second part, I will be just unabashed about this. This is a pitch to Dr. Bell to carry back to HHS because we would like to actually have Medicare data that we can use for general purposes.

The Medicare data that we have now dates from, I believe, 2005 and we should be receiving it up through 2011 but the data use agreement that surrounds that, attaches it to a specific research project that's run out of the Medical University of South Carolina. So while we may link to our other data sources with the Medicare data in support of that project which focuses on disparities, we do not have permission for general use of the Medicare data, nor do we have an agreement in place through which ORS may receive and deploy Medicare data in support of the exchange. We'd like to move forward on that front with CMS and we've had some discussions with CMS and in various venues along those lines but thus far, we don't have an agreement in place and I think that would be valuable both to the Medicaid agency and also to the state HIE in general.

And I would just respond, David, that I would actually agree with you, and in fact, that discussion was most recently as a few hours ago about the fact that as much as CMS would like to be able to share this data beyond its particular arena right now, it will take literally an act of Congress so there's a lot of discussion around how can language to allow that to occur be incorporated in some of the HIT bills that are currently on the Hill and there are a lot of different ways this can happen but it does have to go into legislation on the Hill.

All right. We understand fully and again, we're fully in support of that process as well. I think that all states could benefit from that.

Yeah, fully agree.

Great, thank you. Another specific question about the system in South Carolina is can this information be accessed via a discoverable Web service, for example, as part of a service oriented architecture framework?

That is precisely the framework we use: a federated service-oriented architecture. In fact, our interoperability framework was one of the three Microsoft help user group finalists at the most recent HIMSS. We weren't actually the winner but we were one of three finalists, so yes, it is federated SOA.

Okay, great. And did you construct a centralized terminology service?

We have some centralized terminology services in place, those aren't complete. Right now we focus on ICD for procedures, obviously CPT HCPCS, LOINK for labs, we have some SNOMED elements but that's not fully developed yet but primarily, it's IC, particularly with the claims data, it's ICD and CPT HCPCS.

Okay. I think you've maybe answered to some degree this next question which was, have you identified applications or opportunities to use the clinical data for research or predictive modeling? I think you may have ___

I can speak to a couple of those as well.

Okay.

We have a new partner that we're beginning to engage, they're actually, they have a product called Sebastian and the company is Religent out of North Carolina but it's a product that was actually developed by Duke Medical Center that is a rules engine and we're deploying that for clinical care but the rules engine also has the ability to establish characteristics of a deidentified HIPAA limited data set, that's one project. A second project, our architecture has the ability to generate HIPAA limited, deidentified data sets from any of the nodes on the network. Currently, Lakeland's Rural Health Network has a quality improvement grant from HRSA that we're going to leverage the exchange to actually deliver the quality measures, for example, a diabetes education program, that's one of the other research-driven secondary uses that we're engaged in.

Third and finally, we've also had some discussions with the observational medical outcomes partnership in order to use these large observational databases potentially to monitor and identify adverse drug-related events that may escape clinical trials due to the lack of, simply the lack of, in really that occurs in a clinical trial that may miss a rare event that you could pick up on through observational uses.

So, we're doing a lot of these things and we have plans to do a lot of them in the future. I think that's another one of the values is closing the loop between research and quality improvement and developing best practices and then delivering that back to the point of care and then capturing the data from the point of care to validate those outcomes and to improve them further. I think all of this is really an interconnected cycle of things that need to occur.

Before we go to Marco's last question, we had another question that came in because I think Marco's last question is even more involved but I think William McCallis' question is a bit related to some of the ones you're already answered and that is, is patient permission required to distribute claims data through the Medicaid EPHR?

Absolutely. The Medicaid agency actually pushes that out through their enrollment cycle. In addition, as part of the policy process that surrounds this, all of the providers that sign on have to modify their notice of privacy practices to indicate the data sources and the potential use to the exchange. The patient is given the opportunity to opt out globally at each and every provider at any time and they're also given the opportunity to rescind that decision by contacting either the Medicaid agency or ORS should they change their mind.

Excellent. Barry Hugo has his hand up and I don't know, do you, are you able to open his line, Nicole, is his line connected?

Yes, he should be ___ right now.

Okay, so Barry, what's your question?

Yeah, hi. I was just wondering how accepting the providers were of claims-based data populating their EHR?

We found in our discussions with them, when you talk about it in the abstract, they're not very accepting of it. When you present it to them in a UI or actually give them an opportunity to see

the value firsthand of the claims data, they've been very impressed. Even the early pilot, with the simple Web-based, secure Web push of the data, the providers that participated in that pilot were universally impressed with the amount of information that they could get from it but you know, in my experience, there is an initial hurdle to overcome because they just don't see what they could get from claims because they never look at claims in a longitudinal sense.

Yeah, that was an excellent question, Barry, I had the same question, did that sort of address it?

Yes, it does, thank you very much.

Okay, thank you. Now, the sort of question that we often ask ourselves or certainly at the federal government when and probably the state government, too, as you put money into something, into a project, how do you measure the effectiveness of your EHR model?

In some cases, what we're looking at now are specific disease management projects that are focused on quality improvement. That's one of the ways that we're going about it currently. We have some plans that are not, that are sort of in their early stages of looking at some ROI issues and things like that a little later on. But right now, what we're trying to do is look at quality improvement first through some blunt measures like, for example, in a case like diabetes, whether or not we're reducing or can show some reductions in things like ED utilizations that could have been handled at primary care or could have been handled through consultation, all the way to actually using the lab and clinical data that's collected to make sure that certain disease protocols are followed and then hopefully through that then can demonstrate the mechanism that leads you to lower utilization rates so we're just beginning to go down that road now and again, one of the first-real world examples of that will be the HRSA evaluation that's going on at Lakeland's.

And actually, sort of going back to Barry's question, Dr. Bell, as I see, your thoughts on the claims-based populated EHR and how does that fit in with certification standards, or are those two things not related or, you know, information that you have in terms of the utility of that because I know there's been a lot of conversation around claims-based EHRs versus, you know, solely clinical data or most, or more clinical-generated data?

Well, I think it comes down to whether or not the physician has an EHR to begin with. If he or she already has an EHR, then the claims-based information, if it's interoperable may certainly help. But, I think they need to find value in having an EHR to begin with or at least that's the message that's come forth to us, too, and if you have an EHR and you also, especially now in 2008 as we're moving forward with, with the certification process that has the interoperable CCD in it, you'll be able to have information shared from other providers that comes in through this clinical way. This clinical format and in particular, if there is a health information exchange available, then a CCD can go from one provider to another without any problem at all and that's really useful clinical information and that may actually supersede in the course of the next year or two, the value of populating the claims but I think, again, without having any of that, you start with claims. It's better than nothing and I think it's worked very well. I think it is a first step though and I think we probably will be transitioning as more and more health information exchanges become available and the CCD is available to sharing information through the CCD.

Yeah, I'd like to add on a comment to that and I agree with the essence of what Dr. Bell is saying. I would take a little issue with a couple of points.

First of all, the problem with certified EMR adoption. While we know that this is moving forward and we know the certification standards are moving forward and we know there are plans within the next few years, hopefully, to have everyone on a certified EMR, currently, again, from Dr. Bell's slides, we can see that there's not really a lot there to be shared, I mean, and what claims give you is while they're not clinically very deep, they're very broad and they tend to cover entire populations of one sort or another and so this gives you the ability to (a) to give value to everyone right out of the box rather than waiting to connect enough EMRs and also systems running in facilities like hospitals to provide the kind of clinical value that Dr. Bell's talking about although I could not agree more, ultimately, that it's where we want to go.

And again, I would just add, I think you're absolutely right and I think there are certain settings where it's going to be more valuable than others.

Others, right.

Like an emergency room situation, it's absolutely critical. As you get into perhaps some other situations, it may not be quite as valuable so it's all in the eye of the beholder, I think is really the bottom line.

Right.

But it absolutely has value.

Right. And that's really why we try to do both and the other piece that I would add because certified EMRs are a relatively new phenomenon and the cost of loading those EMRs on the staffs which are probably keying paper records and things like that or going through a conversion process, at least in our experience, indicates that there is not a very long history that goes along with that and again, when you're talking about certain kinds of chronic diseases and so on, claims repositories tend to have much more in the way of history so if you're just looking at sort of the indications of problem and how they're progressed over a long period of time, I would also say claims are very useful on that count.

And Dr. Patterson, you may have said this in your presentation and I may have missed it but do you have a general sense of the adoption rate in South Carolina, the adoption rate for EHRs in South Carolina?

No, actually, we have tried desperately to get an, a reasonable measure of that both through the Medicaid QIO that serves both North Carolina and South Carolina and through the Medical Association. We do not have a clear sense. I can tell you anecdotally, we're probably below the national average primarily because we are a more rural than usual state. But, no, we really don't have good hard numbers on that in South Carolina.

We have another question from Marco and this may be the question that ends up being what we wrap up with today as we come close to 3:30 and that is, how can you leverage this technology to improve claims adjudication, so, for example, could providers submit a CCD as a claims

attachment? What's your experience? So Dr. Bell, from a national perspective, have you seen this and Dr. Patterson, what's been the experience in South Carolina?

Well, I'll just say, it hasn't happened yet from the national point of view so I'll turn this over to you, David.

Hasn't happened from the state point of view either. We really don't do any billing through our system so other than pulling data perhaps, billing data perhaps from a practice management system or a hospital system, that's the closest that we interact with that. I do know that the Medicaid agency is interested in looking at this as they move towards more managed care and also pay for performance but right now, essentially we have not done anything practically that way.

And Marco, you may want to look up the folks in Utah at the Utah Information Network. I know that they're Medicaid agency, has become much more engaged in the exchange of information in terms of claims and they've expanded their capabilities to be able to attach many kinds of documents and they may actually be doing exactly what you're talking about.

Well, I'd like to thank both Dr. Patterson and Dr. Bell, I now you both are extremely busy and I'm so grateful that you made some time to spend with us this afternoon. I think your presentations were very helpful and then as always, the commentary and the great questions that we had, I appreciate your responses to those.

Before we sign off, I just wanted to remind folks that we do have an email address for the project, the Medicaid SCHIP Health Information Technology Assistance Project and Nicole has put that up on the screen for us, if you have any comments or recommendations about this webinar, about future topics you'd like to hear about or whatever, you can send a message to this email address or you can call this toll-free number and also what we have on here is we are beginning to develop a Medicaid SCHIP-specific site, a part of the National Resource Center Website and so to go directly to that page, it's the first link that Nicole has up there on the screen and then the second link is to take you to the homepage of the Resource Center Website in general. And I think you'll find a lot of resources there for the Medicaid SCHIP-specific site. What we're working on right now, is gathering sort of a subset of the knowledge library, the vast knowledge library that's on the main site, a subset of articles and so on that are potentially specifically relevant to Medicaid and SCHIP agencies to sort of, you know, cut down on the number of articles or references that you would have to go through to hopefully get you to some that may be most relevant to you.

And I would like to thank everybody for your participation and time today and please do be in touch with us and give us feedback so that we can make this technical assistance project, you know, work to the benefit, to the best benefit of all of you. So I thank you for your participation today.

Thank you very much.

Thank you. And thank you to my co-presenter, Dr. Bell, it was a very informative presentation from my perspective as well.

And yours as well, thank you so much, everyone. Have a great weekend.

Bye-bye.