

A National Web Conference on E-Prescribing and Medication Management
(March 31, 2009)

Good afternoon everyone, my name is Brian Dixon and I am with the Agency for Healthcare Research and Quality's (AHRQ) National Resource Center for Health Information Technology. I would like to welcome you to today's webinar on E-Prescribing and Medication Management. In just a moment I will pass things off to the moderator, Bob Mayes of AHRQ. First I want to go over a couple of logistical points this afternoon. If you have any technical difficulties you can call WebEx technical support at 1-866-229-3239. Second, all of our questions during the Q & A period during the second half of the webinar will be directed through the chat feature of WebEx. You probably see the chat box on the right-hand side. Please make sure when you type in questions that you direct them to all of the panelists. That way, our panelists can see them while they are responding and read them ahead of time. Finally, in a few moments I will begin a pre-conference survey. We use this data for quality assurance purposes and to monitor how well the technology and presentations are working online. Please do provide your feedback.

At this time I would like to turn it over Bob Mayes, who will introduce our panel and get us started.

Thank you, I'm Bob Mayes. I am a Senior Advisor on Health IT here at AHRQ. Welcome to what is the first of three national web conferences on E-Prescribing and Medication Management. We will be looking at process throughout the three conferences on medication management, from prescribing to dispensing and then all the way to adherence by the patient. We have three great speakers today. I will keep their introductions brief so we have time for questions and discussion at the end. Douglas Bell is an Associate Professor in the Department of Medicine at the University of California Los Angeles as well as a Research Scientist at the Rand Corporation. Dr. Bell is a leading health services researcher and has done a lot of work in the area of E-Prescribing and electronic support for medication management as well as looking more broadly at issues around Health IT and healthcare redesign.

Dr. Bell will be presenting a conceptual model for the medication management process with an emphasis on the prescribing part of it, as well as talking about areas that really need to be looked at for improvement. He will be followed by Dr. David Mehr who is Professor and Director of Research for the Curtis W. and Ann H. Long Department of Family and Community Medicine at the University of Missouri. Dr. Mehr is also a well established health services researcher, has worked in a variety of areas, including management of complex patients, particularly in long term settings as well as end of life settings. He's currently a principal investigator for an AHRQ funded grant to evaluate new information technology tools for improving ambulatory chronic disease care. Today he's really going to be talking about the challenge of one of the first things that has to get right in terms of the entire medication management process, which is understanding what medications an individual is currently on, and is taking. Sounds simple, but in real life it's actually quite a challenging thing. He will be followed by Ken Majkowski. He's vice president of clinical affairs and product strategy for Surescripts LLC. Dr. Majkowski will look at the issues around medication histories. He will focus on the value of using pharmacy-based data and information for looking at the problems around medication histories that are used at the start of the prescribing process. He's going to finish up with an overview of some of the political and regulatory issues that we're now seeing in the realm of e-prescribing, particularly with the new stimulus package. With that I will turn it over to Dr. Bell, the first speaker, and after the three speakers have made their presentations we will open it up for questions. Thank you.

Thanks, very much, Bob. It's really an honor to kickoff this series. I would also like to start by acknowledging AHRQ and CMS for co-sponsoring most of the research I am going to show you as part of the 2006 E-Prescribing pilot studies. First, I wanted to step back and start with some context for looking at E-Prescribing as a model system. I got interested in E-Prescribing when stand alone systems first started to emerge, because they're simple and yet they're a functioning Health IT organism. The hope is they could be a model system that could help us to understand more general principles about how Health IT works; somewhat like the aplysia sea slug has worked as a model system in neurobiology. I should explain that this sea slug is important in neurobiology because it only has about 20,000 neurons, but it's

been used to elucidate some of the basic mechanisms of learning and memory. Analogously, the E-Prescribing systems have fewer moving parts than bigger Health IT systems and the hope is that we could use them to really understand some principals. The difference is that E-Prescribing systems are at least partially designed by people and also they directly affect our pocketbooks. Or at least they have the potential to and also they have the potential to influence health outcomes. They are also a policy instrument that has a lot of currency right now. The Medicare Modernization Act is where this first came to the floor. The act itself said that E-Prescribing should be used to deliver information to the point of care that enables more informed decisions about appropriate and cost effective medications. And they mandated that part D plans accept E-prescriptions via standards. More recently with the MIPPA legislation, there's a bonus that could be substantial for "meaningful use" for E-Prescribing and that swings by 2014 to a penalty for not E-prescribing. So E-Prescribing is really emerging as an important policy instrument. The question, of course, is how E-Prescribing specifically can influence policy. These questions are important for certification, especially from CCHIT and for the policy setting for transaction standards, which is how the different systems in the commercial realm can communicate key pieces of information to each other like the medication history information or formulary and benefit information. That's the arena that we're working in. If we want to understand how some of these low-level information, or let's call it micro-level information elements, really work at a mechanistic level, we have to understand the causal mechanism whereby these pieces of information cause some change in what the practitioner sees in the display -- that is really what can change work processes, which is the linchpin of E-Prescribing systems having their effect. That is what would change drug use, which is the main way this influences health outcomes. And other effects that we care a lot about, especially labor, which will drive whether these things are adopted or not. And other important things like tradeoffs and health service use between drugs and other kinds of health services.

This is the main process model that we laid out back in 2004 to focus on the big picture of medication management and how E-Prescribing fits in. To really go from those casual steps that I just showed you to really putting it all together. We have five steps that are in the boxes here. Prescribe; transmit; dispense, which of course happens in the pharmacy; administer, which in the outpatient realm that is the patient, and then monitor and ultimately feedback to the next prescribing decision. The formalism we are using here is based on IDEF0, although loosely based on that. Where the inputs to a given process step are on the left. The outputs are on the right. The resources that get used by the step, not actually consumed, are below. Information that governs the step is above. This lets us fit together certain things like formulary information, which was of particular interest in the pilot studies. And patient history, especially the patient medication history, was another standard that was or rather that is now actually mandated through the Medicare Modernization Act, or through CMS rules that have to be implemented by systems to be certified. I won't go through this in a lot more detail and we can talk more about it later. But I want to show you how we applied this to try to understand how some of these specific changes in standards would influence outcomes and labor costs and how we try to move this towards a simulation model.

I will move on to the next slide then. The first thing we did was to try to map the processes in more detail in a way that we could move towards understanding what the probabilities are of each task taking place and how much resource time each task would consume. So the first thing we did was to expand and add subtasks within some of these boxes, like prescribe in the office. If you are going to prescribe electronically, actually in this or really in either case we are assuming there's a step where the clinician reviews medication history, at least sometimes, and selects a medication. This is when there's an input that is a need for a new prescription. That is the main input to this whole process, some assessment that there's a need for a new prescription. And then that would go through transmission of some form using one of these resources—potentially, even just the patient carrying the medication prescription to the pharmacy. Within the pharmacy we did also want to model labor because some of these pieces of information could have a major influence on pharmacy labor, so we did break that down as well. Especially we needed to understand the adjudication step, because if that fails – and I should just say that adjudication for those of you that don't know is when the pharmacy submits the claim electronically and a computer system determines whether it will be paid for or how much the co-pay is etc. That's a key step that often leads to trouble if it fails. We felt we needed to include that in the model. And then we didn't worry so much at this point about patient administration or monitoring. But we'll talk more about that if you would like. Then the important next step that we did was to add the rework pathways that we don't

often think about. As I was saying before, adjudication in particular can fail, or even the pharmacist may look at the incoming prescription and decide that it is underspecified and that is not an infrequent occurrence that a key piece of information gets left out in the handwriting world. All of these things wind up requiring messages back to the prescriber, which wind up taking time and also sort of shunting the process. Those of you that are physicians are probably familiar with the notion of left to right shunt or right to left shunt. A lot of prescriptions do wind up getting shunted back into this -- into messages and not reaching the patient. And this extra work can be a major drain on prescriber time. I won't go into any more detail here in the interest of time, but we can come back to it. That model that I just showed was for any prescribing including handwritten prescribing. When we start E-Prescribing there are certain additional things that can happen. For instance, not only in the prescribing step can you review the medication history and select a medication, but then an alert may go off, that's this round box here. There's a cycle here within the prescribe step, where an alert can go off for a drug-drug interaction or formulary benefit alert where it may say that a medication is not on the formulary, and the prescriber has to spend some time to review the alert and decide to change the medication. That's an upfront time investment that we wanted to model. The color coding and I won't go into detail here, is to help us track how specific kinds of information, like medication history, may influence some of these processes. The other big thing to notice here is that these reworked pathways have not gone away, because none of these processes are perfect, the alerts here are not perfect. But they are expected to become less. So they're just attenuated, essentially. Unfortunately, it doesn't necessarily make the model any simpler when we add E-prescribing; it just makes it more complicated.

Then, to make things even more complicated, we wanted to move towards a process model that we could really simulate. To do that we worked with the experts participating in our study and tried to flush out all of the steps that would consume time for anyone, we actually did not model the patients' time, but for any healthcare provider or staff member, for pharmacists, we wanted to model all of the steps that would consume time and what the probabilities were of those steps actually being undertaken. This is much too small for you to see, but there's a PDF of this for you afterwards if you really want to look at it; hopefully this is scalable. There were about 120 steps in total when we blew this all up. The point here is that there were too many parameters to estimate for a model that we were actually going to simulate. We decided to focus on just the most important steps we thought would change with E-prescribing, going from handwritten prescribing to E-prescribing. Or that were just important steps that would consume time for the majority of prescriptions. That's the thing to illustrate here. Also, this particular screen just shows the expansion of that first box, the prescribe box. These are all of the sub-steps within that and we have similar expansions for each of the subsequent steps as well.

To go ahead and move toward modeling we set up simulations in Excel. They were just deterministic simulations we didn't try to do discrete event modeling at this point. We wanted to model a few situations. The base case for us was a traditional handwritten prescription. The complete case was E-Prescribing with all of the different kinds of information that were being considered to be mandated. Formulary and benefit information, that is what I meant by F and B, medication history and also electronic renewals. We also modeled situations in between this, such as E-Prescribing with just formulary benefit information or E-Prescribing with just medication history information. Those were the situations. Each of those was a separate model. The components of each model were tasks and the resource allocation that each task demanded and then routing rules, which are the conditional probabilities of entering a task, or going between tasks. As I said before, we selected these components out of the micro-level model that I showed you, by focusing on what we thought were the key elements. There were modules, these components that assembled into the modules that I showed you, corresponding to the macro-level steps: prescribe, transmit, dispense, we actually merged deliver and monitor together and we added a new module for exception handling. We then estimated parameter values for these, to the extent we could, from field studies we were conducting and from the literature. An important caveat is we did need to make quite a few assumptions to make the model feasible. I will show you some of those. But we're still calibrating these assumptions, everything I show you should be considered to be preliminary results from here forward.

This slide shows some of the assumptions we made for some of the key steps here. I will just orient you quickly. There's a column of probabilities for entering a step. And there's an amount of staff time and an

amount of physician time, and we're just modeling physicians as prescribers although we know that nurse practitioners and others do so sometimes. There's a time in seconds that we're assuming to be the base probability for this particular situation. The situation that we're looking at here is a new prescription via electronic prescription with formulary and benefit information available. We're modeling what happens with a thousand prescriptions. All of this is set up in Excel so that we can change these and do sensitivity analysis. Just to highlight a couple of things, especially for formulary and benefit, we're assuming the prevalence of a formulary and benefit exception—the way we define this is an exception that is significant enough to cause a call back from the pharmacy. So, the prescriber is selecting something that will wind up with a callback. That is 1% at baseline, of all new prescriptions. That could vary a lot in reality depending on the individual's prescribing habits, or depending on the kinds of medications they typically use. For instance if somebody is prescribing a lot of asthma inhalers, that's one where that might trigger a lot more of these than other areas. Then we have an important thing that changes when you have the formulary and benefits standard—what is the probability that this exception will be detected by the system? We know that formulary and benefit information that is available today is imperfect. Sometimes patients' coverage information can't be retrieved by the systems for various reasons, even when they have coverage information that would end up applying when they go to the pharmacy. So we modeled this as only an 80% probability, even with the formulary and benefit information, that it would be detected. We did some sensitivity analysis on these. Also, the prescriber may spend time -- we put 30 seconds down based on a little bit of observational study, we did this for the time it takes the prescriber to look and consider this information. But then they wouldn't always necessarily change the medication even after they see it. Although in this case we assume that they did. That's just one example of some of the key parameters that we estimated and put into the model.

Then here are some sample results comparing what happens to prescriber time and staff time under these different scenarios. The base case is paper prescribing. This graph shows the total number of hours for a thousand prescriptions, which would be for a lot of prescribers on the order of three to six months of new prescriptions. This is a total number of hours spent on the prescribe task over that amount of time. This is on the transmit task. Dispense and deliver and monitor are really just pharmacy time in this model. Then time spent on exceptions is here. And then the total time is over here. You can see when you go from paper to basic E-Prescribing and beyond that to E-Prescribing with each of these two standards that I mentioned, there's a tradeoff between more time spent upfront in the prescribing step, while you are reviewing some of these alerts, to less time spent handling exceptions down the line. And then when you total that time up, E-Prescribing may still wind up taking more time net for the prescriber. And, again, this may depend on a lot of other things like what kinds of medications are being prescribed and on things like whether the prescriber can set up favorites that would speed their selection of medications. But in general we found in our own field studies, and actually there is a paper in JAMIA by Hollingsworth that shows slightly longer times overall for E-Prescribing than for hand-written prescription at least on the new prescription step. The big change is in staff time. The staff was formerly spending some time on submitting the prescription and then a substantial amount of time dealing with exception calls. Overall staff time, we've seen this repeatedly in the field, it decreases much more substantially than prescriber's time. One of the take home lessons that we're looking at now is how we need to try to use this staff time that is freed up in some way that helps benefit prescribers and helps to tip the balance of time back towards saving time for prescribers and for staff. That's the kind of tradeoff that we can look at and explore with this simulation model. That's what I wanted to show you today, how we're starting to use simulation modeling to explore socio-technical design alternatives, including the kinds interoperability standards we just talked about, and also work process configurations, like how telephone calls will be handled, like how renewals could be handled more efficiently, for instance. And we think that policy changes and financial incentives might be fit into models like this as well. The limitations, of course, are that work processes may differ a lot in the "wild" between different practices. A lot of parameter estimates will remain uncertain. This is also a deterministic model which is still relatively simplistic approach to modeling compared to other methods that might be used like a Queuing Theory model. That's where we stand today. I will turn it over to the moderator.

Thanks. That was quite interesting. Again, you can input your questions at anytime but we'll actually take the questions after all three presenters have presented. Let's go ahead and move to the next presentation by Dr. Mehr.

Thank you. I want to make the same acknowledgements that Doug made in the beginning. It's a pleasure to be able to participate today. I appreciate the support of AHRQ for my work.

I want to take you through some of the issues involved in getting accurate medication information, which is a key underlying process that needs to happen to have successful E-prescribing. Those of you that are clinicians I'm sure need no reminder that with the increasing number of patients that are cared for with multiple chronic diseases, there are multiple providers, multiple medications and it's impossible to function with the average person with several chronic diseases without carefully maintained medication lists, which are difficult to create.

Accurate listing of medications is needed to guide therapy changes, to avoid drug interactions, and to provide key information to others. For example if a patient is hospitalized, it's critically important to be able to know what is being done by providers in the ambulatory setting.

First of all, there's a variety of different ways that errors can appear in medication lists. I don't want to suggest that these are all due to the patient, but patients certainly can contribute to errors in medication lists. I rarely suggest that anything is always true, but I would say that a patient that has a complex medicine regimen and doesn't maintain a list is asking for trouble. If a patient doesn't maintain a list and comes in for a clinical appointment, they're unlikely to remember their complex regimen, or to be able to tell you if their regimen matches your list. I've been surprised over the years by how many patients make the assumption that providers know what other providers are prescribing. I've heard over and over from patients "don't you know what Dr. Jones is prescribing for me? I assumed that you communicated." Well, we may or may not have been communicating, but it's extremely unlikely that I have an accurate listing of what Dr. Jones thinks he's prescribing or what Dr. Jones thinks that the patient is taking. Even if we are in the same medical system or if we have some kind of shared medical record. And then, finally, a really important issue is even if you have a good list of prescription medicines, patients often fail to include over the counter medications. These may have important implications. For example, in urinary function, a number of over the counter cold and allergy medicines may have important impacts on urinary function. As well as, since I am a geriatrician, over the counter antihistamines such as diphenhydramine or Benadryl for causing problems with confusion.

But in addition to the patient problems there are also system problems that we encounter. Many of you are aware of all of the problems that have been identified in terms of transitions of patients in and out of acute care. We are required to have a medication reconciliation process when patients are admitted and discharged from the hospital, but this process is critically dependent on obtaining a good medication history at admission, which is often difficult. This is particularly difficult with patients that may get medications from more than one provider or more than one pharmacy or may not remember their medications. The pharmacist puts in a great deal of time to trace down all of the sources. They find often significant differences in the medications list they obtained from the medications list the clinicians obtained at admission. Furthermore, even with a medication reconciliation process there is not a guarantee there won't be serious medication problems after discharge. Particularly, again, if the history information at admission is not good, the discharge medication regimen may not be good and the patient may go home and be faced with confusion about which medications should be taken. The old medicines, the new medicines, particularly if these aren't included in medication reconciliation. These problems are even worse when you get into situations out of the acute care setting and out of the ambulatory setting and go into the nursing home setting. Medication reconciliation really does not exist in my personal experience in patients going from long term care to the next setting. There's huge potential for serious problems -- think about high-risk medications like Warfarin and when the patient is discharged from long term care. If it's not set up who will obtain the next pro time and who will be responsible for getting that result and acting on it.

Finally, in terms of systems problems, there is the potential for ambulatory providers to make errors of omission, not getting things recorded, errors of recording and the possibility of system crashes. I had a recent experience in which our electronic record froze and I had to write hand prescriptions, which were not going to be included in our electronic record and would have to be added later.

I want to talk briefly about possible approaches to improving the quality of the medication information that is available within the electronic record. One of the processes that we use is to have a printed list given to patients who come in for each clinic visit and ask them to indicate whether this is in fact what they're taking. That's great, but it depends on patient's memory, having an accurate list of their own. Again, there are problems of potentially not including over the counter medicines. Having the patient bring in all of their medications in a brown bag potentially works better if they include everything. It's time-consuming to go through that. There's the possibility of online reconciliation if they have access to an online version of their medications and has the possibility of indicating whether that's correct or not. Something that I haven't mentioned up here that Ken will go into is the possibility of providers having a claims database so they have access to what prescriptions the patient has actually filled.

I mentioned there are problems with all of these. If you give people a list of their medications it may be overwhelming and may not be carefully examined. It's not uncommon when I am faced with a long list that I will ask about a specific medication that I'm concerned about only to find out that the patient has not looked carefully and confirmed that the dose of that medication was actually being taken. Even if the patient is asked to bring in all of their medications they may not bring any or may only bring some. Medications have to be accurately entered into the system in some way. Of course, that's time-consuming and there are issues around the most effective way to do that.

What I'm showing you here is a generic version of a system that some of our patients have access to. I'm going to put this in full-screen version, which I hope will help viewers see what I want to point out on here. The first thing I want to say is that this is not a very intuitive program. It's not so obvious what you are supposed to do for this. It's not the "status" and "please explain" buttons where the patient is expected to comment on whether they are or are not taking these medications. They need explanation, which is not there. The mediacese here is not common English and may not be clear. This is accurately representing the medical record, but not in a form that is easily understandable. And the other issue about this is that in this particular system this comes into the clinic as a text message, which says that the patient is or is not taking these particular medications, which means that the clinic staff then has to correct the medical record. There are better systems that exist than this for having patients have electronic access to their data so they can correct them. But our system has some real major deficiencies.

Another thing that I didn't show you about this particular system is that it contains the capability of a personal health record and it's not necessarily going to be clear to patients whether medications are only in their personal health record, or whether they're also available for wider use. I mentioned usability issues. There are issues with prompting patients to use this, if it's going to be useful. I mentioned the problem of incorporating the report into workflow.

In conclusion, I think I have given a number of examples of why accurate medication lists are important. And I've talked about some of the patient and system-level challenges to getting accurate medication listings. I'm happy to answer questions when we get to the discussion period.

Thanks a lot, David. You know this really points out that we have seen this fundamental challenge of how we actually begin the whole process with an accurate picture of what current therapies the patient is on. The traditional way of thinking about it is either you know it as the provider, although we've seen that's a problem because there are oftentimes multiple providers, or that the individual themselves has a thorough enough understanding of their medication regimen to be able to effectively communicate that to you. There are potentially some other sources of data that can augment the provider patient dyad. We will let Dr. Majkowski talk about that.

Thank you, Bob. Thank you to AHRQ for sponsoring this webinar, it's a pleasure to be on a webinar with Doug and David. What I would like to do is talk a little bit about medication management during the act of E-prescribing. Give you an idea of what kind of information is available. How it can be used during the prescribing process. Some of the issues that exist with the data. And some of the things that clinicians need to be aware of. And talk a little about at the end, which is something Doug touched on, about the

incentives that exist for E-Prescribing and what has to be there within the application and within the data and the transaction steps that will allow physicians to be able to qualify for the incentives.

The first thing is to make sure we have a clear and concise definition. Many think of E-Prescribing as the electronic transmitting of the prescription from the physician's office to the pharmacy of a patient's choice whether that is retail or mail order or whatever. I think it's important to step back from that particular prescription routing process to also keep in mind that there is decision support information available at the point of care from payers that allow physicians to have access to a patient-specific formulary and claims medication history as well as pharmacy medication history. So they could bring this information into the process and hopefully at that point create the most clinically appropriate and economically appropriate prescription for that patient at the point of care. If that's done, that can cut down on the rework process that Doug alluded to.

I want to go through a much simpler model that Doug did. This is what we hope E-Prescribing looks like the majority of time. We know that there are exceptions but for the majority of the time what we hope E-Prescribing looks like is that for the most part a patient has an event with a physician, a visit with the physician. And that physician's E-Prescribing system had some interface with a practice management system or a scheduling system that allows that application to transact with payers to pull down eligibility formulary and medication history prior to the patient coming into the office. Now, in the case of a patient who is a walk in or a new patient these transactions can happen in real time. They can happen after the patient is triaged into the system. These transactions take place right after the patient registers at the registration desk and has the ability to pull a magazine out of the rack and sit down. Information is needed at the point of the patient's visit that allows for the opportunity to look them up in the master person index. When we find that patient we send that information to the patient's payer, so we can get information such as eligibility formulary and benefit and medication history. We can also query participating retail pharmacy field data for medication history. This information is fed back to the physician's application so while they're prescribing they have as much clinical decision support and economical decision support information as necessary to create a clean and valid prescription. When it's time for the transaction or to prescribe that physician can create that prescription and with the patient in the room they can decide where to send it to be processed. Whether it is down to the local pharmacy, clinic pharmacy, pharmacy in a mall or chain store or wherever that patient prefers to have it sent.

The other process that is part of that whole thing is the bidirectional communication between the pharmacy and the physician such that pharmacies can ask for renewal when the refills run out and the physician can renew the medications electronically as well. When I talk about the master person index, right now we have 220 million members of various payers that allow us to find patients. Today we're finding about 75% to 80% of patients that we get eligibility requests for on a daily basis. When we find that information we pass that information to the payers so that eligibility responses can be passed back to the application. For the most part everything we do at SureScripts is in a distributive model. We hold very little data at SureScripts and make sure that the data stays at the source. When it comes to prescription history we have the ability to get claims data and several of our applications can also get pharmacy fill data. We're in the process since our merger last summer of creating cross-connects so that a single medication history request for any of our technology vendors will then return medication history not only from payers but also from connected pharmacies as well. Once these applications have this data they have the ability to perform drug utilization review, take a look at compliance, therapeutic interventions, duplicate therapy, drug to drug interactions, and a variety of things that can help the physician during the prescribing process.

Then the prescription can be routed through the network to the pharmacy of the patient's choice. This gives you an idea of where we have critical mass. We continue to add payer and pharmacy data. We have accessibility of greater than 50% of the patients in 49 states, including Washington DC and Puerto Rico. We do find a fair number that have multiple coverage. They may have coverage from more than one payer. Sometimes this is due to carve out and sometimes it's due to duplicate coverage from husband and wife both having coverage and both keeping coverage. We continue to grow this critical mass as we're starting to work with a number of Medicaid's who have gotten transformation grants to participate in E-Prescribing programs and it's something we do on a daily basis.

When we talk about prescription history, there are a couple of things that I want to talk about here. The prescription history from payers and from pharmacies gives a date range to the history, in most cases we can provide one year's worth of active data. We provide the drug name, the brand and the generic and the key thing is we provide the drug that was dispensed. Because in adjudicated claims and in pharmacy fill data, it's actually what the pharmacy dispensed to the patient that gets into their prescription profile or into the drug database. We have the number of fills, the dates, quantity, from the pharmacy data we also have the instructions, take one tablet four times a day and this is information we will pass back down to the application. Something that is good about the value of claims data for example is that it's the precise, accurate and longitudinal look as to how a patient utilizes their prescription benefit. So we can see that a patient who is getting a 30-day supply every 40 or 50 or 60 days, we have some idea as to what their compliance may be. The pharmacy fill data has the data of what is adjudicated through a patient prescription drug benefit but can also have the prescriptions from Medicaid that are not participating. It can have the \$4 generics that are popular in many chains. It can have self-pays or have drugs that fall below co-pay levels and are often sold to patients at lower rates. As we continue to work on our data sources to get medication history we continue to broaden the critical mass of data that we have available. I've been with SureScripts for about seven and a half years now coming from the Rx Hub side. Three years ago we had data from three sources. Today we have data from about 30 payers and about 12 pharmacy systems, we continue to grow that. Something that is also important there are issues that relate to medication history. Once it gets to the application not all applications have the functionality to provide a view into the patient's medication history that uses all of the functionality that it could. Not all applications, for example, use the longitudinal aspect of medication history that can help lead towards discovering non-adherence and non-compliance in patients to medication regimens. We have some things to overcome. I call the medication history that we provide an electronic brown bag that David described. Just like a brown bag of medications that a patient brings in with them, you have to sort through the medications, make sure that the right ones are in the right bottles, make sure the wife's medications aren't included when the husband brings his medications in. At the end of the day an electronic medications history list is a start of a saga in the hands of a good clinician. It's important that people understand what is there and what is not there. David alluded to some of that. What are some of the over the counter medications, what are some of the neutraceuticals, what are some of the things that the patient might be taking that might never show up on a claims database and that may not show up a pharmacy fill database that need to be discussed with that patient?

We also have a service where we provide medication history through technology partners that have medication reconciliation products. We're servicing about 70 or 75 hospitals today through various partners such as Siemens, the Regenstrief Institute, Healthcare Systems, Standard Registry, Doctor First and others that deliver medication history via their products to hospital settings.

The other thing that we're very involved with as we were when we were Rx Hub and we continue to do with combined energy is ICE Rx. This stems from hurricane Katrina back in 2007. We partnered with the Gold Standard Multi Media, the AMA, the Markle Foundation, SureScripts and Rx Hub to allow medication histories for displaced people from the hurricane area to be accessed by clinicians for free. The AMA authenticated physicians, SureScripts authenticated pharmacies and we all put in our data to be available for clinicians for displaced persons during disasters. We have since put ICE Rx into effect during the California wildfires and then last fall during hurricanes Gustav and Ike. Whenever the President declares a federal disaster, we anticipate that we might put ICE Rx into effect to have medication history available in the case of a displaced individual.

I want to talk about some of the incentives that are available for physicians who are going to be E- Prescribing and who are going to be using EHRs. The American Recovery and Reinvestment Act has put a ton of money towards this. We're talking about billions of dollars now that are going to be made available for technology for physicians and hospitals. The Stimulus Act provides \$17 billion to promote adoption of certified EHRs by hospitals and physicians. Incentive payment and non-adoption penalties are available through both Medicare and Medicaid. The Stimulus Act codifies the Office of the National Coordinator in HHS and provides another \$2 billion to promote HIT adoption. It provides for additional multi-billion dollar funding mainly through grants for states and federally qualified health centers. It

expands privacy and security protections for health information, including extended HIPAA privacy and security requirements to business associates and increasing enforcement, including new authorities for state Attorney Generals. There is a lot in the stimulus package. The incentives through Medicaid are for both hospitals and for physicians; hospitals can get up to a total payment of \$10 million plus per hospital, based on discharge bonuses and other parameters. Physicians can earn up to \$44,000 over a five year period if they use a certified EHR beginning in 2011 and there are payments that would be made each year starting in 2011 and going through 2015. One of the things that is interesting is that the physicians have to use EHRs and they have to have "meaningful use." "Meaningful use" is in the stimulus bill. It's in the process of being defined. There are various groups trying to help with the definition, the Markle Foundation is one and I participate with them. They're looking at how "meaningful use" could be defined. Frankly, this is a personal opinion. E-Prescribing is a poster child for "meaningful use." Because in the bill they are looking for both increased or improved outcomes in patient care, as well as increased efficiencies and cost effectiveness in health care as well. The ability to provide formulary and benefit information does create efficiencies and improvements in costs. There have been a variety of initiatives like the Southeast Michigan initiatives with Ford, Chrysler and GM showing improvements in generic usage or formulary usage, or Michael Fischer's article in the Archives of Internal Medicine, in December, showing improvements in formulary use and cost saving for payers utilizing E-prescribing, and improved outcomes by using medication history and the various drug utilization review aspects that the E-Prescribing applications provide for during the actual patient visit. There are also incentives available through Medicaid. Physicians need to either get incentives through Medicare or Medicaid and not through both. Payments are for 85% of EHR purchases for qualified physicians. You must meet qualifying volume and practice site criteria. Payments are for \$25,000 in year one, \$10,000 in year 2, and up to 5% for no more than five years with a maximum of payment to physicians of \$63,750.

Interesting in both cases, penalties for late or non-adoption occurs in both programs. There are exceptions that can be made by the secretary in this provision. As we get to 2015 and past there will be penalties in part B payments to physicians who are not using EHRs, who are not doing quality reporting, who are not in the process of exchanging data with other areas like health information exchanges or hospitals. And again, the key thing is using EHRs and making sure there's "meaningful use" of those EHRs. One other thing that is important is that physicians may earn the Medicare E-Prescribing incentive concurrently with these incentives from the stimulus package. What I mean by that is the MIPPA incentive. It started this year, MIPPA was passed last July and it allows for 2% incentives in 2009 and 2010 to part B billing for physicians that use E-Prescribing using qualified systems. Qualified systems are those that meet the CMS definition of E-prescribing, which includes the ability to get eligibility, formulary and benefit information, medication history and have the ability to electronically transport prescriptions to the pharmacy of a patient's choice. Those incentives decrease in 2011 and 2012. In 2012 non-adopter penalties start taking place. We're in the process of MIPPA right now. It means physicians can get MIPAA incentives from 2009-2013 and in 2011 they can start getting the stimulus package money for using EHRs that are certified and qualified as well as showing "meaningful use."

There's more information at the CMS website on all of these incentives. I want to complete this presentation by giving everybody just a snapshot of E-Prescribing readiness. The key thing is there's a national infrastructure in place. It's established, it's tested, it's secure and it's been in place for six plus years and been in use for six plus years. Transaction standards are approved. Many of these were used in very early E-Prescribing pilots in the late '90s and early 2000's. All states since 2007 are approved for E-Prescribing and it is legal in all states. Solution providers are certified on transactions and data usage as are payers. Very early Doug mentioned that MMA back in 2003-2004 led to all of this. What is important about today's webinar is that back in 2003 when MMA was passed those of us who are into E-Prescribing were looking out to this date of April 1, 2009 as being so far away, by god it's tomorrow. Tomorrow is the date that those payers who have PDPs and MAPDs need to make sure they have the ability to transact to all of the E-Prescribing standards which were tested in the E-Prescribing pilots in 2006 and 2007. And have now become part of the E-Prescribing definition. There are incentive plans in place, not only from the federal government, but at local levels from payers and employers and there're additional incentives that will continue to be in place at the local and regional level. And there is a return on investment that is proven for all stakeholders.

I want to conclude the presentation by listing our website at SureScripts dot com. We are positioning it as the E-Prescribing resource center. This was launched on March 10. There is a lot of information, best practices, E-Prescribing physicians and pharmacies in your area. I also wanted to direct you to the AHRQ website, the link is there. There are many, many great resources there to help you as well. At this point I would like to thank you for the opportunity to present today. I will turn it back over to Bob.

Thanks, Ken. I thank all of the presenters and all of the folks that are sending in lots of questions here. We have about 15 or 20 minutes here. We will not be able to get to each question. I would point out that each of the presenters is kind enough within their presentation to provide their email addresses. If you have a specific follow-on question, it's possible for you to get in touch with a presenter on a particular question. There was a question about the availability of the slides. Whoever has the ball, can you move forward a couple of slides? I do believe we talk about where the slides will be. There you go. Both the recording of this conference and the slides will be available within a couple of weeks at the website listed there, which is the AHRQ National Resource Center for Health IT.

I would like to perhaps get a couple of the questions answered, again, understanding that several of the participants have asked similar questions. I am going to pick some broad areas and I think you will get some of the information relating to your questions. I would like to start with a comment that I think that what we're really seeing here, I would argue this is probably applicable not just within medication management but healthcare in general. What we're seeing is there's a shift in perception from looking at the issue around medication management as a series of tasks to really a process orientation and understanding that you have to look at it as a process if you want to optimize it. Otherwise you are sub-optimizing specific tasks. This gets to a number of questions that were asked around the issue of workflow changes. I think Doug pointed out that the adoption of E-Prescribing in the current model will add to the work of certain parts of the team, i.e. the prescriber and yet dramatically reduce the effort from other parts of the support team. Doug, if you could start out, a comment or two on how you view this issue of workflow and process reengineering and whether you see E-Prescribing pushing us towards a more formal process reengineering type of approach or fit E-Prescribing into the existing processes?

Thanks, Bob. That's a really good question. I think it's an important thing to consider. It could go either way. Before I even answer that let me say I should have acknowledged a couple of people who really did the modeling work that I showed, Shinyi Woo who is an industrial Engineer at Rand and at USC and Hyang Park who is a faculty member at the University of Seoul in Korea. What you are saying essentially is are we just going to sort of pave the cow paths of the processes that exist today, you know, or are we really going to step back and figure out how to redesign the processes to take advantage of what E- Prescribing can do that is totally different? I think it could go either way. We see as we start to go out into the field with a new study that you are supporting, we see both of these things happening. Hopefully by explicit process modeling we can do better at moving towards really thoughtful and innovative designs whereby protocols could be put in place for staff to handle some routine things like renewals, where a patient is otherwise up to date and in good control and could take other actions based on protocols. And start to help offload some things that are today being pushed onto the provider by E- Prescribing systems. But we don't always see that happening.

Okay. Ken, let me ask you to jump in. There were a number of questions when you discussed the various incentives, which asked about, well most of the stuff in the bill is aimed at the providers, the prescribers and such, and less so around the pharmacy and the pharmacists. Can you maybe talk a bit about that? There were also some concerns about when and how controlled substances might be begin to play into this picture, as well.

Yes, thank you, Bob. You are right, I saw the question about incentives for pharmacies. There are not many for pharmacies at this time. There are some state initiatives for pharmacies to get connected. Blue Cross Blue Shield of North Carolina had incentives for pharmacies that were equal to the incentives they were paying physicians last year. The people in Indiana are considering incentives for pharmacies to connect as well. Those are happening more at the local level. My understanding is for pharmacies E- Prescribing that Medicare is directing PDPs to take that into account when they are negotiating with pharmacies on dispensing rates for pharmacies that can E-prescribe. So there are some things

happening, but I think the questioner is right that the majority of incentives are for physicians. Now, the question on controlled substances is an interesting one as well. DEA came out with sample language about nine months ago and requested feedback by the end of September of last year. My understanding from what I have heard from our participants and other stakeholders is that they received many, many responses with a lot of suggestions. There was hope that there would be some ruling by the DEA and the previous administration that did not occur. There were rumors that the DEA would come out with language in April or May of this year, we're not sure if that will occur. It's important to understand that the DEA is not a healthcare organization it is an enforcement organization. If you have participated in their committee meetings and their processes, you know, they're very much on physical evidence, things you can touch, fingerprint, take pictures of. Electronic prescribing is something that is different for them. We're hoping that the DEA process continues to move forward. We don't know if it will require some legislative action. We know there are a lot of proponents to get E-Prescribing for controlled substances in the Senate. Back when the current president was in the Senate he was a signer to Senator Whitehouse's proposal to get E-Prescribing to controlled substances through. There's a lot of support for it, but there's a lot of things that have happened in this nation since last fall, specifically to the economy. It will be interesting to see at what point that gets addressed again.

Let me add to this because I'm involved in this from the federal side. The DEA is not in the health sector. The DEA received a lot of public comment and approached HHS to help them respond to everyone and help them reformulate some of the language. That's continuing to go on. I will say that they have been extremely receptive to issues that have been raised in terms of practice issues and workflow and other things around the business of providing healthcare services. That's an effort that continues. I think we will ultimately see rules that meet the needs from both perspectives.

Thanks for that, Bob.

There's one other series of questions that came out that are sort of related. Several people asked about the ability both now and currently going forward into the future of capturing information on alternative medicines or over the counter drugs. I was also noting one question that I thought was also quite relevant, which is when we talked about E-Prescribing in these presentations and in general we tend to focus on relatively straightforward prescription of single medications. Yet there are many treatment regimens that are prescribed that are a lot more complex than that, it's not just a doctor prescribing a pill. There are issues with chemotherapeutic or nutritional regimens, that kind of thing. Any of you, I will start with Ken, but maybe Doug or David want to jump in. Where do you see this whole thing moving towards that? Towards really being able to look at this as more than just logistic management of pills?

Interesting question. Let me address the OTC one first. That's going to be a difficult one. It's going to be hard because when people buy OTCs they're consumers, they purchase those not in relationship to getting a prescription but often times when they are just shopping. They may not be in pain but they may buy Ibuprofen because they know that they are out of it. They may not have an upset stomach but they buy their renididine or Tums because they know they're out of it. Also when I buy my ibuprofen or renididine not only do I use it but my wife uses it as well. How do we capture it at the point of sale in a grocery or pharmacy or convenience store how someone uses OTCs? I think that's problematic. Whether pharmacy point of sale systems can capture that when they are dispensing prescriptions, again, you are only going to get a slice of the pie and not the whole pie. The question about specialty pharmacies, home infusion pharmacies, home care pharmacies and things like that, I think that the focus has not been there because of the sheer numbers that are in retail and mail order pharmacy. What has to happen in homecare pharmacies and homecare agencies and specialty pharmacies is they will have to use pharmacy applications that have the ability to transact. Retail pharmacy, the applications cannot transact to the standards that exist today for E-prescribing. And they're fairly widespread. They are available to 55,000 pharmacies and if you took those 55,000 probably 80% are being serviced by 20 or 30 different apps. The applications in specialty pharmacy may or may not fit into the same pharmacy applications used in retail pharmacy. There might be a technological hurdle there. We're starting to work with long-term care pharmacy. During the CMS pilot we did a long-term pilot. We're finding workflows are different, transaction specifications are different and what has happened since then is that the long-term pharmacy industry has participated with NCPDP to create a new standard that has transactions that are long-term

care specific. We may have to do that same type of thing in specialty pharmacies as well. I don't know. Up until this point we've not had a lot of interest from that area. When that occurs we will have to see how the transactions fit into the workflow and that specific area of pharmacy.

This is David Mehr. Just a brief comment. You know, I think that the problem of over the counters and alternative medicines and neutraceuticals is a huge problem. Clearly those products can have important side effects and drug interactions. Somehow systems will have to create a capacity for that data getting in. How that will happen is not so obvious to me at this point.

I will ask Doug if you have anything else to add.

Sure. I agreed with pretty much everything that has been said. I do think those are important additional challenges. We do also have to keep focusing on making the retail parts work and focus on the things that are going to be the most important to patient care. Some of these things are very important to patient care. Coverage of specialty prescriptions can be a big expense. And can have major implications for patients, that's an important challenge to take on. One other thing I wanted to mention is that often home infusions have much more complicated instructions for patients than would typically be handled in prescribing standards today. One of the things being worked on is how to better represent these complicated SIGs, instructions for patients or administration and that's another area to watch.

That's a great lead-in to a brief explanation of the next couple of calls in this series. This is a three-part series looking at medication management. Not just the prescribing part of it—that has been the focus of today's talk. The next talk is in early June, we will look at the issues around dispensing, if you will. That involves thinking about how best to begin or how do we work the pharmacy's workflow in with the clinician's workflow? How do we look at issues like instructions to patients? I think those of you that are interested in some of these questions will find the next call interesting. For the last call we will look at the issue around adherence or monitoring. I think that that's an interesting area; we can be great at writing the right prescription, getting the prescription filled but if the patient is not taking it then we have kind of dropped the ball. I think that will also begin to bring us back, we'll be getting to see a number of new technologies that might actually take the place of that brown paper bag that was talked about. There are examples of technologies that are linking back into databases that are much more accurately tracking what and when various medications are being taken by an individual. We may be able to create a really circular workflow, which includes the prescribers, the dispensers and the takers. With that we're out of time. I would like to thank all of the panelists. I hope this has been helpful to all of the participants. I urge you to join us for the next couple of calls, as well.

Thank you very much and have a good afternoon.