How Clinical Decision Support Can Be Used to Monitor and Improve Population Health

November 18, 2008

Welcome to a National Web Conference on How Clinical Decision Support Can Be Used to Monitor and Improve Population Health. This is the third teleconference in a four-part series on clinical decision support (CDS). My name is Chris Dymek and I help support the National Resource Center for Health Information Technology. I would like to review a few logistical items with you before we begin. First of all, please respond to a poll that you will see opening in a few minutes. Also, there will be a Q&A session at the end of our panelist's presentations. You may, however, submit a question at any time during the webinar using the Q&A for chat function window on the lower right hand side of your screen. Right now, I would like to introduce you to our moderator, Teresa Zayas-Caban. Dr. Zayas-Caban is a senior manager for Health IT with the Agency for Healthcare Research and Quality.

Thank you, Chris. I'd like to welcome you all to this teleconference. We have a great panel of speakers today. Our first presentation will be led by the Kaiser Permanente Care Management Institute (CMI) Group. Since its inception in 1997, it has supported the health and wellness of KP members by partnering with KP regional and national stakeholders in applying the best evidence and approaches to superior clinical performance. CMI assists in the care of KP members by synthesizing knowledge about successful clinical approaches, including the creation, implementation, and evaluation of effective care management practices. Dr. Wiley Chan is the Director of Guidelines and Evidence-Based Medicine and an internal medicine physician in the NW Permanente Group. Carol Cain supports the incubation of early innovations. And Leslee Budge leads CMI's electronic clinical decision support initiative.

Our second speaker today is Dr. Farzad Mostashari. He is Assistant Commissioner and Chair of the Primary Care Information Project at the New York City Department of Health and Mental Hygiene, with the goal of encouraging and facilitating the adoption of secure public health-oriented health information technology and health information exchange in New York City. He is a member of the eHealth Initiative's Leadership Council and serves as Chair of the International Society for Disease Surveillance.

Last but not least, Theresa Cullen is the Chief Information Officer and Director of The Office of Information Technology for the Indian Health Service, an agency within the Department of Health and Human Services. Dr. Cullen oversees a diverse range of agency functions in health information systems planning, development, and management. She has overseen the successful development, implementation and deployment of multiple health information technology applications, including clinical quality reporting, population health management and bi-directional data sharing. Prior to her current position, she served the IHS as the Senior Medical Informatics Consultant from 1999 through 2006. And like myself, she is a Badger. Carol, take it away.

I am from Kaiser's Care Management Institute where we look at issues of population health, chronic disease management and prevention. As many of you know Kaiser has been on a journey of making health information technology available to its members. We're learning so much about how to use electronic clinical decision support (CDS), not just to support our physicians at the point of care but to support our other staff. At Kaiser, we are committed to total health and helping our members thrive. Understanding their clinical needs and the challenges of chronic conditions, we provide the tools to assist our providers as well as the needs of the individuals they are treating. This also means that we incorporate evidence-based best practices in clinical guidelines into their care.

We see this as a journey. As we have gotten used to the EMR we have been refining the alerts, reminders and other clinical decision support capabilities within the EMR. We have also been refining the other electronic tools which give us another view into the rich electronic data we are collecting, as well as the workflow among our staff so that they can better use that information. Our journey has involved implementation in our different regions as well as a national strategy on how to integrate the best practices known into clinical decision support.

I would like to introduce my two colleagues. Dr. Chan has been at Kaiser for 25 years and worked primarily in our Northwest region. He is currently Director of Guidelines and Evidence Based Management. Dr. Chan will talk about some population care clinical decision support capabilities. Leslee has been involved at Kaiser with several initiatives and evidence-based guidelines around chronic disease. She oversees our national clinical decision support initiative which looks forward at how Kaiser will tie together our clinical decision support and our evidence based guidelines work. I will hand the presentation to Dr. Chan.

Thank-you, Carol. Just quickly again an overview of what I will be talking about in my section. First briefly, I will discuss the demographics of Kaiser Permanente, and then I want to show how we advance the population care tools into our electronic medical record. I'll spend the remainder of the time discussing our panel management tool, what we call the Panel Support Tool, emphasizing the issues around implementation and our evaluation and the tool.

First, at Kaiser Permanente we have over 8 million members across eight regions and nice states. In the northwest region that I will be showing, where the tool is specifically implemented and operational, we have just under 5,000 members. Just under one-third of those members are registered for our on-line services. We have about 1,200 medical providers and 26 outpatient medical clinics. We went on-line with our electronic medical record in the northwest region in 1995, and the panel management tool was internally developed between the NW and HI Kaiser system and went on line in 2006.

The first thing I am going to show you is the health maintenance reminder tool. This is just an example of some of the things we can embed that support population care. You notice, for example, the mammogram screening health maintenance reminder- it shows you when the mammogram was completed, the date satisfied, and when it is due next. If you look at the pap health maintenance reminder, you can see the kinds of things we have to build into these alerts, such as age ranges and time intervals. What it's not showing you are the technical details such as, what is required to complete this health maintenance reminder, but those things are all completely programmable for us. One of the things we do with these health maintenance reminders is trigger another decision support tool called a best practice alert. So these are triggered by two of the health maintenance reminders that I showed you on the last screen. We would know for example, looking at the bottom one, that if a person has not had a blood pressure taken in the last year, or that the last blood pressure was above some specified level, or that this person was overdue for their lipid screening test. We can also show the results of the last screening test for the use of the physician at the point of care. I should point out that these best practice alerts can be programmed to come up many different ways. For example, currently, the tool can come up passively, it is the first thing that opens, but providers are not required to take any action. They can also become modal with the user being forced to take some interaction with the tool and take some kind of action--but we found those to be unpopular. Another example of a best practice alert that is tied to a health maintenance reminder is our aspirin alert. We turn this on for people who are flagged in our diabetes registry or our atherosclerotic registry if they don't have a current aspirin order. One of the reasons I am showing this is because the beauty of these alerts is that we can tie them to another tool called a smart set, which is on the next slide. What this tool does is to have the order for aspirin defaulted, all you have to do is click accept and sign, and you'll get an aspirin order and patient instructions that will print out on the visit summary for the patient. This is the default order that occurs if you just accept it and sign. This is the top 25 percent of the low dose aspirin instructions that will print out for the patient.

We also spent a lot of our time developing this panel management tool. Our tools are very focused on individual clinical priorities. We try to support the clinicians to carry out those clinical priorities as much as we can, but they're highly targeted. The panel management tool, on the other hand, is designed to look at a broad range of health care needs, both at the individual patient level and across an entire panel of primary care providers and patients. So what I'm showing you first is that our panel support tool is used for in-reach, meaning a patient who is coming in for a visit. The tool is set up so that the medical assistant, the back office staff, can print out these summary reviews for every patient who is coming in that day. So what you will see on the screen on the left is the kind of detail that is presented at the point of care in the panel support tool. Therefore we know what medication the person is on, the last emergency room visit, the last blood pressure test, and you can see lipid values there. In the upper left-hand corner, you will notice that there are seven different boxes with colors and various letters in them. The first one is labeled DM. That is the diabetes registry. The ‘Y’ means this person is in the Diabetes Registry and the red means they have a high level gap related to diabetes. For CKD, there is green marker here that means that this person is not in the CKD registry. The center section in red includes all the specific recommendations for this particular patient. It displays some of the same sorts of alerts that we present in our electronic medical records. This tool is not fully integrated with the electronic medical record. We do have a mechanism in the electronic medical record where you can toggle with one click to the chart from the past. These red alerts here include things like for this patient with diabetes is overdue for the foot screening, their HbA1C is overdue. We also put immunization reports in our panel support tool.

To show you how this is used in outreach, this is the full panel view. An individual primary care provider would open up this panel view and see their entire list of patients ranked by any particular method that the provider chooses. By default, it comes up ranked by what we call the total gap score, which is a somewhat artificially created summary of weighted care gap for every single member in a panel. You can also sort by any particular registry. For example, if I clicked the DM header, I would get everyone with diabetes whether they had a red care gap or not, same for hypertension, or age or gender or other areas by metric. Using this method, a primary care physician could decide, today I want to work on mammogram screening and sort them by prevention gap and see people that are only due for a mammogram. The physician could simultaneously address the rest of the gaps and prioritize by any particular gap of interest. This gives our primary healthcare teams the ability to outreach to their population based on their particular operational priorities and work force.

This slide shows the gaps that are currently programmed into our panel support tool. I am only showing you the adult care gaps. We also have a pediatric panel support tool which has different kinds of gaps. You'll notice in the therapy gaps we have the usual big hitters: cardiovascular disease, diabetes, aspirin, asthma, things like that. We also have features that enable the user to monitor gaps. For example, with respect to diabetes, LDL, screening for cardiovascular disease and diabetes. We also have our prevention gaps, such as pap smear, vaccination and mammogram. All of those things are programmed into the panel support tool. Individual clinicians and healthcare teams have the ability to prioritize and rank their entire panel by any particular gap.

One of the most important things that we discovered about these kinds of tools, the panel support tool in particular, is that the tool alone is not enough to accomplish what we are really after. To really make it work it had to be fully integrated into our operational workflows. The next couple of slides have some examples of what we did to support the tool. What we see here is a tip sheet for the medical assistance which shows them exactly how to interpret the gaps that they see on the panel support tool. The second panel has detailed instructions about what they're supposed to do if they see a particular gap. These instructions include detailed information about exactly how they are to use the panel support tool and how to address the gaps.

This next slide is an example of one of our electronic medical record tools, the SmartSet, which provides support to the panel support tool. In this particular SmartSet, we can see all of the orders that address the gaps that are brought up by the panel support tool for the use of the medical assistant. The standard work flow is that the MA would ‘pend’ the orders for the clinician to sign. The clinician could of course rescind the order at that point, but the general agreement is that the back-office staff will pend all of the orders that are brought up by the panel support tool and stage them for the clinician.

The next slide is an example of what are called talking points for the medical assistant so that they can have the initial a conversation with the patient about the pros and cons and the utility of having any particular thing done. Our medical assistants really enjoy expanding their role beyond just moving patients around, and at least initiating these conversations with patients about high priority clinical areas.

We wanted to see what sort of impact our panel support tools had on users. We looked at providers who utilize the tool a lot, versus medium utilizers and low utilizers, and examined their care gap scores over a period of time. This tool was rolled out in 2006. We had some best practices training a year after go-live What we showed was that the health care teams which had utilized the tool to a great degree had larger drops in their care gap scores, when compared to medium and low utilizers. Furthermore we could show that there was definitely a correlation between our HEDIS scores improving and this same time period. We have a lot of confidence in the panel support tool was integral to the improvement in our clinical quality scores. Some of the things that we found out in terms of getting our population-based care recommendations to the point of care, was that some of our electronic health tools are utilized more than others. To ensure that the tools are being used, we could make it modal, meaning that the user has to take some action in order to get rid of it, but those tools are only used for extremely high priority issues because of the high annoyance factor. Another way is to make the tool quickly and well. Our Aspirin best practice alert and tool is an example of this. We have many things that are not particularly population based care that are more efficient in our decision support tool than by any other mechanism. For instance our amiodarone monitoring tool is very popular since it is difficult to remember all the things one is supposed to be monitoring.

One of the key things is to the active promotion of our clinical content tools, which requires leadership and sponsorship aligned with our organizational priorities. And the thing that really seems to have the most impact for us, is when we can fully integrate the content into our standard work flows, including vigorous support for the implementation tools and training.

Just to summarize what I am showing, there are many ways by which we could bring guidance to the point of care, and the more fully integrated it is with the work flow, the better it seems to be used. We really are looking for alignment between our clinical guidelines and clinical content, our organizational priorities and operational work flows. At Kaiser Permanente, we have the expectation that the people who serve on our clinical guidelines teams will actively participate in the implementation at the regional level. And with that I will pass it on to Leslee to talk about our future goals in clinical decision support.

As you can see, from what Wiley has presented, we have already done a lot with integrating clinical decision support into our work processes, but we still have a ways to go. I will cover two areas. The first is improving the usability of our knowledge repository, which we call our Clinical Library, and the second is moving from a paper-based world to an electronic world for our guidelines.

I apologize that this slide is a little bit small. Here is where our national guidelines fit. We have a lot of references to national guidelines that we keep up-to-date in our clinical library. We have a reference shelf that has linkages to full text books and journal articles. We have clinician education, and one of our most used sites is the educational set of documents. We have information about drug labs, imaging, health care news and operational resources. We did three lines of user testing, and gathered more requirements from our users. From this we found that this kind of format is not working for our users. So we are in the process of rearranging the clinical website, so that it will take fewer clicks to get to the clinical guidance that our clinicians need when they use this tool.

The next area is moving away from the paper-based world using a Microsoft word document and marking it up in XML. We are just starting this work-Wiley is one of the leads in this effort. This has big implications for many areas of our guideline development. Our guideline development teams need to take a bigger role in developing guidelines. It is no longer going to be enough to say “initiate treatment for hypertension”. We need to know the population included in that recommendation and what populations are excluded from that recommendation. When you say hypertension, is it the coded diagnosis, or is it three blood pressures, two of which have been elevated? We really need to be very specific about our definitions. The elements have to be codeable, so in your exclusion population what codes that exclude people? For instance with essential hypertension we are excluding diabetics since they have their own set of recommendations. We have to be specific about our drugs and our lab test that support those recommendations. The guidance must be actionable. We have tried to move away from the word “consider”, -I'm just wondering what a computer would do with the word “consider” we use. We need to make our guidelines machine readable. Even within our guidelines, we know that every single recommendation is not going to need to be as explicitly defined as others, so we will have to prioritize and use top recommendations. The bigger issue is how do we prioritize guidelines among members with multiple co-morbidities.

This is our future vision-to start with something that is up-takale into a computer and go out from there to our other clinical decision support tools and into our electronic health records. That is my quick overview. I'll turn it back to the moderator.

Thank you, Leslee. Now we'll have our second presenter, Farzad Mostashari. You can go ahead and start.

I am going to talk about the Primary Care Information Project here at the New York City Health Department. Our goal is to use Health IT to advance community health and safety. I should start by acknowledging what medical care looks like from a public health perspective. First of all, medical care is looking more interesting to public health than it did from a few decades ago. It's gotten good enough to matter-no offense to medical care. Unfortunately, the potential public health gains that we could get out of medical care we were not seeing. This is particular true where most outpatient health care is delivered in small practices. From our perspective, the health care reform agenda hasn't sufficiently focused on quality of care for the measures that matter-the greatest potential for saving lives and user productive life.

I was glad to see on the KP slides that they showed 3 out of the 4 that I have here in terms of the ABCs of things that far and away have a greater potential impact then all of all the things that we could be doing in medical care. But how are we doing on these things? 33% of people who are at increased risk of CVD are taking aspirin; 44% of individuals with hypertension have adequately controlled blood pressure; among those with high cholesterol, 25% have adequately controlled hyperlipidemia; and 20% of smokers who try to quit receive medications to help with smoking cessation. And this despite spending $2 trillion. So what is the role of government? Why is the city of New York involved in this? There are two issues. One, if there is going to be more spending on health IT- can it address priority public health issues well? And two, is it going to reach disadvantaged populations, disparity issues? Our project mission is to increase the quality of care in medically underserved areas through health IT. We are very fortunate to have had an initial investment of $30,000,000 and 40 staff working on this project. Our resources include contributions from the practices, $15 million from New York State, $11 million from grants and development and private donations from the Robin Hood Fund and Wellpoint foundation among others. This is our vision for what it is going to take.

I was glad Wiley said that it isn't enough to have and EHRs on their own they don't improve the quality of care, even when they are oriented towards prevention. We know most electronic health records are not oriented towards prevention. We also need care management workflows to support prevention. And ultimately, if we're orienting providers to invest in electronic healthcare, there have to be payments that reward the provider if he controls a patient's blood pressure or not. Our 2010 goals are to: extend EHRs that support prevention to the 2,500 Medicaid PCPs in New York City (over 1.5 million patients); to provide practices with clinical quality score cards and practice redesign technical assistance; to design and implement a pay-for-performance incentive program; and to support EHR that supports and recognizes preventive measures; and to support EHR-enabled PCPs in standardized HIE. These are high goals but we're making pretty good progress. Our approach to the EHR extension piece has been to say, if you are a primary care provider who serves the Medicaid and uninsured population and you are willing to participate in our project and put $4,000 in cash in the quality improvement fund, you will get a license to eClinicalWorks, Take Care NY integrated EHR, including on-site training, interfaces and two years' software maintenance and support. We have signed agreements with -- and this is evenly split -- small practices, community health centers and hospitals. It is unusual that we'd able to serve all three types of practices. We have a new practice going live on the EHR every single day. We have 138 practices live at 130 sites and 843 providers. In total, it is the largest of its kind. These are private practices out there that see Medicaid patients. These practices don't 'belong to us'.

When it came time to try to assess the benefit of these health records, we realized that there are commercially available health records on the market, but these don't come with any of the prevention stuff we wanted. So we've worked with eClinical works over the past year and a half on this product. These are the first eight features we worked on; we are working on an additional set now. Within the health record that a single solo practitioner can buy from the market includes measure reports, enhanced registry functions, visual alerts, CDSS, quick orders, comprehensive order sets, medication history, the history and immunization registry, and school health integrations. First, we think it is pretty important that providers be able to see the quality they are delivering on these standardized measures compared to other providers in the community and in their own practice. We think that is a pretty important motivator. Within the health record itself, they will be able to run these measures looking at different reporting intervals. These reports can be run at any time, so not necessarily at the end of the quarter or the end of the year when the providers may not recognize the data or where it has come from. Rather, it is right from their clinical information system itself. This contains enhanced registry functions-getting to that list of patients. It has the flexibility to create queries, build the query, see the patients, and send a letter to the patients to bring them back in-the outreach concept. Some of the passive reminders have conditional formatting here, such as that the person's blood pressure was high, there should be a little bit of emphasis to note that.

And then, this is the decision support that we're pretty proud of, these features are directly linked to the quality measures. In fact, there aren't two separate logic models, one updated for the decision support and the other one for the quality measures. The quality measures we chose were the ones we felt best represented best practice guidelines. We said that if this individual patient is in the denominator of the measure, and they are not in the numerator, that should trigger *this* reminder. So the decision support *is* quality measurement at the point of care. Fundamentally, I think that this is a new approach that we're using to simplify both our communication and the programming here. So, on an individual patient, while I'm seeing the patient and doing the SOAP note on the middle panel, on the right side I see all of the decision support alerts. What is interesting is to see it integrated in the system, not in a separate place, is that they are actionable. So here on the right pane I can click on the HbA1C there and order it. It is dynamic and it instantly recalculates and the alert disappears. In some cases, you can recognize the need for comprehensive ordersets to be able to select medications and immunizations, procedures, labs, diagnostic imaging, referrals, patient education and so forth.

One piece we think is a huge gap in current medical practice, despite the availability of information, is the incorporation of medication history into clinical decision making. All too often we prescribe something that the patient doesn't fill or the patient is on something we don't know about. This information is available on our patients with commercial insurance through RxHub. In NY we have enabled these same feeds from Medicaid. We are working on a user interface so that clinicians can compare side by side: this is what you prescribed at the top, and what the patient filled on the bottom. The next iteration of this includes a little more intelligence in being able to import directly from this external list into your medication list and to be able to highlight on your med list what hasn't been filled and so forth. I think this is a key area for future development. Also integration with our school health program.

Another key activity we're doing is to try to achieve a population impact around quality improvement on site visits, which we've organized around the patient centered medical home. We're teaching the patients how to get the music out of the piano, as it were. These are the tools they have now and these are individual doctors' offices, many one to two person offices, really with no support structures that someone part of an IDN would enjoy. We're trying to be that connective tissue and to provide them with those types of supports. In addition, we are also working to align incentives. We have 4 million dollars from the Robin Hood Foundation to reward outcomes. For every person for whom you control their blood pressure or lipids you would get a bonus-if the patient were Medicaid or uninsured the bonus is doubled. If they have co-morbidities, it would be doubled again. And finally we strive for linkages to public health, to achieve the other part of the public health paradigm of being able to improve public health surveillance, which is a topic for another day.

One thing I want to note is that we did not build a centralized data repository. This was a very hard decision and unconventional. A lot of people would assume that you would of course do that. If we just get the data on the patient's level, think about all the things you could do. We chose not to do that and I'm very happy that we made that decision. We are really getting the minimum information that we think we need to take action. The principle here is that, everyone has the information they need to take the action that they are responsible for. So we said, in order for us to get a city-wide population health monitoring, we need to know on a practice level what their numerators and denominators are around quality or counts of patients with a particular illness. We are using a truly distributed reporting architecture with only summary counts coming central with the ability to audit or investigate as needed.

And now a word on population health management: we have this information, now what? Let's say we have one doctor's office, with no nurse, a medical assistant and a clerical person who is very busy. We're running as fast as we can and my system generates a list for me that says that these are all my patients who need to be seen. What am I going to do with this list? How am I going to call them back in? I don't have the workflows or the staffing to do this. Our concept is that there is a gap here in terms of thinking about all of the things we need to provide to small practices. There is a gap here in terms of this panel management function. This could be a shared function. Each office doesn't need to hire a person to do this; it could be a shared service. But it is a subset of care management activities which would help address a much broader number of at risk patients at a lower cost, so that people with hypertension can have their hypertension controlled before they have a heart attack or congestive heart failure, and then need the care management activities. If anyone knows a funder who would like to gives us a generous donation so that we can test this model…

To put this in the context of the healthcare reform that we are all thinking about here. This is from the Center for American Progress's Blueprint Reform. Tom Lee's Chapter Two is a brilliant chapter. He's talking about how by going up on the payment methodologies and moving away from fee for service toward pay for performance and case rates and sub-capitation up to full capitation, that implies that you need a different functionality, from registries, EMRs, disease management, team-based care and so forth, that are only going to be able to be provided by more organized types of care. These are the stages of evolution of care. I think our perspective is that that's great, and we think that care should be more organized, but we also want to see to it that even the smaller practices can have the benefits of these supporting systems and can therefore compete in a new type of payment superstructure. Finally, I'd like to acknowledge funding from the CDC Center of Excellence in Public Health Informatics and AHRQ. Thank you.

Thank you Farzad for a great presentation. Our last presentation will be Theresa Cullen.

This is Terry. Thank you for the opportunity and thanks for those great presentations prior to mine. I'm going to talk a bit about the Indian Health Service experience. I will talk not only about how we have integrated CDS into our health IT portfolio but also about how we have integrated CDS to get results in population health. To begin with, I want you to be familiar with who we are. We care for about 1.5 million federally-recognized American Indian and Alaskan members. They are in 36 states and are seen in over 400 facilities. We are in the most remote areas of the country. My feeling is, if we can do this, anyone can do this, because we not only have technology issues, but staffing issues, and a population that suffers from the highest disease burden of any minority group in the U.S., the highest rates of diabetes and coronary cardiovascular disease, an epidemic of adolescent suicide, high unemployment and high poverty levels. And despite all of that, we've been able to show tremendous increases. I caution you to compare our rates, however. I will show you some rates compared with what other people have been able to do, especially Kaiser. Kaiser is doing amazing things. Our rates are not where theirs are. We care for a predominately Medicaid/Medicare base population, but the fact that you can show improvement even in a population that has limited access to resources, I think is encouraging to everyone in the healthcare setting.

We believe in the broader picture of health. I will talk a little bit about this today because I think it is important to get beyond the traditional concept of what is CDS and what is population health. Some of this is that we have the luxury of having had a health IT system for over 20 years, initially based on Vista, which is the VA System, obviously modified and leveraged to include the care of the population that includes birth to death, as well as a population that is beset with tremendous behavioral health issues. And, in addition, we are a public health agency. So because of that, concepts people may have, such as assuming that someone else is going to provide for their patients, do not exist in our communities.

Ultimately, the Indian Health Service administers programs, which are the final deliverer of health care. This health care is in a public setting and a public health rubric, just like Farzad noted previously.

RPMS is our decentralized, automated information system. It has over 60 integrated software applications and has been around a long time. I still provide care at one of our sites to a place that has 30 years worth of longitudinal data. You can see our four major categories that are here: infrastructure, practice management, clinical and population/public health. What is important to know about this system is that many of the practice management, clinical and population and public health applications all include and embody components of decision support. I think when we focus on CDS, we tend to focus on traditional medical reminders and outcomes. In the community or health care delivery system that may be beset with fiscal issues, there are obviously practice management issues that need to be paid attention to from a clinical decision support model. This gives you a sense of what we do. We do have a core and do have a national database. But we use what we call a client server application, which means that each facility is running its own database. Some of our facilities do share a database. For instance, all of California is on a shared database, but because of issues with connectivity and web access in some of the most rural areas of the U.S., many of our sites choose to keep their data at the local level. I'll echo what's been said before. We don't do pap smears for our patients out in Rockville. They're done in the field. So who needs this data? People in the field need the information and they need it in a timely manner to enable them to make the best decisions possible.

Here you get a sense of what we have. We have the traditional components that are considered the core of a health IT system, things like patient management, lab and radiology. In addition, we have an expansion of what is considered to be a normal health IT system to include these other areas. The inclusion of those other areas is in fact a prerequisite to being able to move forward into clinical decision support, especially as it affects population health. And you can see here that we have many of these elements. I don't have screen shots of those things that we have been able to do. We do have a clinical system that is predicated on the goal of improving health status and quality and eliminating inequity. Because those are our goals, the only way we know we can get there is through clinical quality. Farzad Mostashari said it well. He noted that he could have a practice working as fast as it can, but because it can't go faster, it has to leverage technology in a way that will help ensure that it can get better outcomes. That is really one of the huge benefits of a health IT system that can provide, at the point of care, on the fly, the information that providers and patients need to make the right decisions.

Coupled with that, we recently released a quality of care web site in an attempt to be transparent. Only 22 percent of our patients actually have access to the Internet. We monitor access to the internet as part of our patient registration demographic data collection. But, what we know is that the quality of care website has proven to be of tremendous interest not only to our patients but to the communities in which we serve. I would remind you that it is never just the patients alone who we need to engage, but also the family and community.

Clinical decision support has really been part of the fabric of RPMS. We believe that the back end, which the providers never see, is critical and that, in certain cases, it has to be consistent. If we are going to compare provider A to provider B, we must be sure that the IT system itself cannot be modified in a way that anyone can come along and say "they are gaming our system" or "my clients are sicker" or anything like that. However, in addition, we wanted to ensure that our providers did have the ability to say "my major interest right now is renal cell carcinoma because I just saw another case of it. And I don't know where these are coming from, and I swear I am seeing more than I should." What we enabled in the system is the ability to use a tool we call QMan or Query Management, in which people can dump in 300 different data fields and do the equivalent of a Boolean logic query at any time. Of course, if they're in a really busy site that has 200,000 active patients, which we have, we recommend that it not be done at 2:30pm on a Friday when everyone wants the system to go. The dependency on that is clearly related to these standard code sets, data dictionary and metadata registry. These are things that we take for granted in a good health IT system on the back end, because that's what they're relying on. They are relying on what we call a parent-child relationship. We all want to make sure that we're pulling the same data forward.

So what is CDS good for? These are some examples of how we have been able to use it: tracking reminders; doing patient based reminders; and rapid cycle creation and implementation. We're in a long-term relationship with the Institute for Healthcare Improvement to do total business process redesign. We design our system with these quick agile development changes, and then we assess right away. The quality of care report with population health data is available at the point of care in a way that can be modified and utilized just like other people have mentioned.

I think it is important to mention what we don't have, though, because I think that these will be the stumbling blocks and at the same time the building blocks of where we need to go for health care to improve in this country. We don't have robust differential diagnostic decision making. If you think about what we all talk about with respect to population health and CDS, they are quality measures that have already been determined, that are monitored and that provide comparison. I sometimes work in the emergency room and I never quite know whether I have made the right decision or haven't made the right decision. When you talk to providers, especially those working with high-risk populations where access to care might not occur again, that ability to increase the probability, knowing that there will always be risk, that you're making the right decision, is critical. The ability to embed diagnostic probability based on population data is an example we routinely use. We have populations with high incidences of obesity and gallbladder disease. The likelihood that a 12 year old has gallbladder disease in certain tribes is much higher than the likelihood that she has something else. However, if she doesn't seek care in one of our population-based health care facilities and goes outside, the other provider may not have any idea of the epidemiology of her community includes gallbladder disease as its number one diagnostic decision maker. Finally, nontraditional determinants of health status—I talk about these alot because I think that these are the contributors to our inability to address the health inequity. What are the barriers to care? What is literacy? How do we assess literacy? Do average childhood events matter? How do we record them in our system? Is violence a critical factor? Is socioeconomic status? Can we use that to trigger things like eligibility for the earned income-tax credit (EITC)? And in our case, because we work with a rural, poor population, we need to ask about things such as water, housing and transportation. Those are the questions we need to ask before someone leaves the emergency room. The answers to these questions may be the predictor of why someone comes back in more trouble than you would have normally anticipated.

What you'll see here is what we have currently tried to do in addition to measuring patient activation. We record goal-setting, if a goal's met, what were the barriers to goal-setting at the beginning visit, what are the barriers as we come up on that, and then we monitor all of this? What you need to know, however, is that none of this stuff is standardized right now. We have a standard way of doing it because we control, on a national level, our database. But for others to do this, they need to note that there's no way to enter intimate partner violence because there is no ICD or CPT code. One way we do this is through ICARE, which is a clinical application we have. It has comprehensive knowledge management couplers. It goes through the patient's database at two or three or four in the morning, whenever you set it, and then it gently suggests to you that it thinks this patient now has hypertension. We now have two or three visits when his or her blood pressure was elevated. Do you want to give them that diagnosis? Remember one of the problems with registries is ensuring that the right people are in the denominator of the registry. This is a way we've tried to work with our physicians, who are welcoming this. They are not feeling like it is a burden that we may be calling to their attention something that in a busy clinic they might have missed. And I apologize because these slides are not really clear. Obviously, to create these patients' panels, which is the term we use, you need to look at how your panel meets the outcomes. And you can't see this here but this enables you to compare yourself with, like the other two speakers have talked about, not only to other people in your practice but to what the goal is for us, and then, because we are a sister agency to CDC, to either a Healthy People 2010 goal or a 2010 goal we have set for ourselves. We have the belief that what we really want to do is look toward the next decade and where we will be then because we are providing care for a lifetime for our patients. We want to see how well our individual patients meet this goal.

Our clinical reporting system includes tracking on a very high number of clinical performance measures. There are about 150, with about 400 subtypes. This slide just gives you some of these measures, which are very similar to what most people are doing. Our focus lately has been on bundling measures:

bundling measures for prevention, bundling measures for control, and bundling measures for health status in a community population. As I said, we've tracked our data from an e-clinical quality since the year 2000 so we have 8 years of data. This is one facility that has given us permission to share their data. Not only do we look at what the measures are but we really look at this linear rise to see if there was a co-factor that made a difference. This gives you a sense of screening measures, intimate partner violence and alcohol. We're not afraid to take on this measure where in 2004 we had less than 1 percent of our patients screened for intimate partner violence. We recognized that it was really important. In fact, some of our belief that we could do this came from Kaiser NW, which has some of the best data in the country about how you could get providers to screen for intimate partner violence. What you see here is a tremendous improvement in these behavioral health factors.

I want to finish up with some slides of a clinical information system optimization because, as both presenters have said, it's not just health IT—rather, health IT is what we leverage. In our organization, we say that we don't have a health IT budget because it's not about a health IT budget, it's about a budget to improve health care status because we don't have a great budget. This gives us the latitude to explain that we're the pipes and you've got to make the pipes work and they have to work in a facile, agile way that will help ensure that we can deliver the care by using the technology in a way that enables us to do this. You see embedded in here a concept of system redesign that, for us, has been a journey, like Carol started with Kaiser. We use these slides to teach our sites. We always want to say to people that these are kind of the tenets of what you need but we know that there are others that will be more applicable to you.

I want to end with just a few slides about where our health IT vision is. I do a power point presentation that's called the "Hemoglobin A1c" and people who know me know that I hate hemoglobin A1c. We have the highest diabetes rates in the country where I provide care. Over 50 percent of the adults are diabetic. At some point I say if we can't measure hemoglobin A1c, we should not be in the healthcare business. We still don't measure everyone 100 percent of the time. We're much better than we were, but what we know is that you have to start there and then you have to have a vision and know that you can use those basic, critical and essential monitoring tools of clinical decision support and integration of clinical decision support and then go beyond that to these other standards and these other factors that we know affect health equity and are really important.

Thank you for the opportunity to present.

Thank you so much Terry. I would like to thank all our speakers. I'd now like to open it up now for questions. Please use the chat feature and send your questions to all panelists. I think we had one earlier, and Leslee or Wiley, I think either of you could answer this. With respect to the aspirin order or order therapy gaps, is there a method to allow patients to report the extent to which they actually follow through with prescribed therapies, and if so, to use that to promote any kind of behavior modification information on an individual basis or in mass?

This is Wiley. I can answer that from our perspective. We routinely query every patient that comes into primary care to verify what medications they are on. That is updated in our electronic medical record so that if we discontinue, let's say, aspirin, then the aspirin alert starts to trigger on that patient and they show up on the panel support tool. We also run adherence reports on our members for certain drugs, statins, and ACE inhibitors, as examples, and we do outreach from our pharmacy program to people that appear to be non-adherent. We don't have any other metric for adherence other than those kinds of things.

This is Carol Cain. To flip it on its head, the other thing that different parts of Kaiser have been experimenting with is using these population care tools to do automated outreach. If the panel pool shows a care gap, we then make a phone call or we do a text message out to the patient and contact them directly. But that is just very limited experimentation right now.

This is Terry. The one thing we do, interestingly enough, is for the subpopulation HIV population. We do medication reconciliation. But for our HIV patients, we do monitor dispensing of meds and we monitor that because we want to make sure that we're tracking and that we're intervening appropriately when there has been noncompliance. We monitor that through prescriptions and pill counts. And we do a longitudinal printout that is shared with the patient that shows: what happened at certain points, that the patient didn't get his or her meds at this point; or the patient's viral load. It also helps determine if there is a problem of if the patient did get the meds somewhere and the IHS just had no idea that the patient had been getting them there.

Thank you. We have another question. One of the attendees is wondering where you draw on for your clinical guidelines for each of your systems. Do you conduct reviews of clinical studies? Do you analyze patient data or do you use guidelines developed by other organizations?

This is Leslee. So the question was about how we develop our guidelines? We use a combination. We have mostly developed our major guidelines internally, but we're starting to move to a process to incorporate guidelines developed by other outside groups, as people move more toward an evidence-based process for developing guidelines. Wiley, do you have anything to add?

We develop most of our guidelines internally but of course rely heavily on existing systematic reviews and have been moving toward adopting certain other organizations' guidelines, for example, those of USPSTF.

This is Farzad Mostashari, and we don't have the resources to develop our guidelines internally so we also rely on USPSTF.

This is Terry. We rely on USPSTF too, but in addition, we work closely with communities. For instance, we have domestic violence clinical reminders, we have depression screening in an adolescent population, and what we do is we use what we know is the disease burden, which we have pulled from the health IT system. Then, we feed that data back and we say do you think this is important? For example, we are releasing a sexual abuse screening reminder and a quality of care report at the tribe's behest.

Thank you all.

This next question is directed to the speakers from Kaiser. This participant is wondering how you define a clinician's panel in order to view the dashboard that you showed. Is it whoever is listed as a patient's primary care provider? Or is it if you have ever seen the patient? Or do you do it by department or a particular office?

This is Wiley Chen. The panel support tool is definitely tied to a primary care provider's panel. The panel statistics are all related to that PCP and his or her assigned patients. We are currently working on a method to determine whether any given clinician acted upon the PST alerts that were active on the day of the visit. For specialty care, an example might be if a general surgeon didn't remind this person to have a pap smear or set her up for a mammogram, even though the PST alert was on. So we're trying to get the PST alerts used in our specialty care departments too. Right now, however, it's definitely PCP-centric.

This is Carol Cain. On the specialty as well, there's some work being done at Kaiser, including a paper currently in submission, about how specialists might start to define their panels and what does it mean to be a specialist looking at a group of patients versus a primary care physician.

This is Terry. We have predetermined panels which are based on PCP assignment. However, our eye care application enables you to go in and say, I want to see everyone I saw once in the last three months in the diabetes clinic and let that be an on-the-fly panel for me that I can assess. Some of this was to counteract a push back from providers saying, those really aren't my panel of patients, and then we will say, let's see everyone's software times in the last year. If these aren't your panel, maybe this is your panel. And we agree on it so that they can have some data given back to them.

That is helpful. I have another question coming into the Chat.

What are some of the problems with disruption of work flow and the learning curve required to get accustomed to using the new system? The participant is wondering in particular about Farzad's experience.

It is a huge disruption to their work flows and definitely is a steep learning curve. So, you know, it is not easy. And I think it is really important for people to have that expectation as they move forward.

Anybody else?

This is Wiley and I would certainly agree. There is a big learning curve, but there is really no alternative where we are. You don't really have any choice. That is the only medical records system we have.

And our experience has been it is a disruptive technology and we just let people know that up front. But of everybody who has suffered through it, nobody would go back.

This is Farzad. The other thing to point out though is that some work flows should be disrupted.

Right.

I have heard people that have done time flow analyses of what a physician's day is like, and it is insane. It certainly is emotionally and, in some cases, financially difficult on the part of the practice to go through a change, but there's not much that we can say in defense of current workflows.

Thank you, all. One participant is wondering about the role of patients in particular with managing population health and whether or not they have access to some of the systems that you have implemented or engaged in different population health management programs?

This is Wiley Chan. I would say that we present a lot of information that is electronically accessible to our members. As I mentioned, just under one-third of our members are registered online users, so on-line, they can see all of their active problem list diagnoses, and we really work hard to get our primary care doctors in particular to maintain the problem list.

They can also see the patient instructions that are typed in at any office visit, the thing that I showed you that we're printing off for example for aspirin would appear online as well, so any kind of instructions that I would type appear online. We're trying to get the panel support tool configured in such a way so that we can post that online as well so that each patient can look at his or her care gaps and hopefully be empowered to engage in the discussion about which ones are important for them to go after. We're very close to being able to produce letters out of the panel support tool that talk about the particular care gaps for each patient and we intend to send those out as part of our birthday letters, so every person would get one on their birthday detailing what kinds of issues we think are important to them.

This is the Indian Health Service and we have an internet digital divide. We have this quality of care website and about three years ago, an invasive cardiologist had a brilliant idea, which in retrospect I couldn't believe we hadn't done, to do a patient health summary as opposed to a provider health summary. So we have a patient wellness summary that the patient receives at the time they enter the clinic and then an updated one at the time they leave the clinic. We actually use this for medication reconciliation but it's also health status reconciliation. We use it for screening so the patient comes in and receives a summary of what their active problems are, what their meds and allergies are, what screenings they need, what they're doing well on, etc. They get an interpretation for their literacy level. For example, the summary might note that the patient's weight is up and that the patient might want to talk to his or her provider. In addition, by the time the patient is coming in to see that provider, questions have been generated to reflect their health status issues with the belief that prepared questions will enable a more engaging and equal relationship between the provider and patient. And then when they leave, they get an updated health summary based on the data that came in during that visit.

Thank you all. One of our participants is wondering if you think that there is something that CDS could do to improve health care disparities versus just improving overall outcomes.

This is Terry. I will take a stab at that. Yes. And I think that the importance of health IT will be that at some point it will help enable the healthcare system to recognize and identify the barriers to care and health outcomes, because they're not limited just to access to care. Give us the data from a population based health perspective and then enable us to focus on clinical decision support tools, which, ultimately should translate into appropriate interventions in patient activation to address health inequity. I also think one of the problems is that health inequity is ill-defined. I think American Indian and Alaskan Natives get lumped together. They have horrible status as a group but I can also show you specific tribes that don't have horrible health status. So the issue is teasing out what goes into that amalgam of what we say is health inequity. I don't think we're there yet.

Thanks Terry. Ok, anybody else?

Okay, so just a more general question: what kinds of challenges do you face or have you faced in implementing population health based tools for use in clinical decision support?

This is Leslee. I can chime in a little bit. Kaiser is a very big organization and I think a mantra is, if you build it, they will not necessarily come. You need the involvement of leadership to help ensure that there is change in the workflow process and that people are engaged and that they know the purpose of using the decision making tools is to improve patient care, so I think that is one thing that the northwest region did especially well when they implemented the panel support tool. Also, there's a challenge with CDS and the panel support tool. As everyone knows, you can over-alert clinicians to take certain actions and then they start overriding those alerts, and that is a really big issue. We're still in a realm where the data we use to generate these alerts and the algorithms we use to identify the patients who need those alerts are not refined enough. If we can more specifically target the right alerts to the right patients, we'll have clinicians who appropriately respond to those alerts.

This is Carol- I have two minor points from an informatics perspective. The first is that you have seen in all of the presentations the need to build something on top of an electronic medical record to do population care. It is not something that is coming right now off the shelf in electronic medical records. This is a challenge that all three of our organizations have had to spend a lot of energy tackling. In terms of resistance, Terry alluded to it, but one easy way for a resistant user to get out of abusing the system is to talk about how the data in the system is not good enough. And there is no question that the data quality often has issues, but it is just an easy excuse for someone to say, I don't want to participate until you have got it all right.

This is Terry. The other thing I would say is that I believe that the only way we're going to contain healthcare is to reengage our providers in a different conceptual medical delivery model. This model will more clearly focus on the patient as one who lives within a family, community and population. The ability to deliver the data from a population health perspective that relates to that individual patient at the point of care is probably only the first of many steps that we need to take to be able to have people understand how helpful and critical this all is. The one thing we have also been working on, which our doctors really want, is the ability to do population based orders. Right now, the vast majority of health IT systems are patient-centric. If you have a population-centric order set, what happens is that all those women that you know just need a screening mammogram, because you know that all those women who need diagnostic mammography are already out of your denominator, can get their mammograms ordered once a month with the click of a button. That is the kind of technology that will save time and increase efficiency and will, in the long run, be beneficial to the healthcare provider.

This is Farzad. I would say that there are certainly many implementation challenges for decision support. How do you maintain and distribute new content? How do you build a well-designed user interface that doesn't drive people nuts? And for us, how do you incorporate epidemiologic information into clinical systems and public health priorities? I think the biggest disappointment is that technology, however good of a job we do on all of these things, it isn't really going to get us to population health. And as Theresa said, there are larger fish that we need to address.

This is Wiley and I want to add a couple points. Terry was talking about a concept that we call back to ordering. We can allow our clinicians to order all of the monitoring orders (A1c, LDL, mammograms, etc.) for their entire panel of patients. Then, the mechanism is set up so that if the patient shows up in specialty care, all the specialist has to do is say “I see you have some labs due. Go to the lab.” The specialist doesn’t have to order them; they’ve been pre-ordered. Then, the results go to the primary care clinician. That’s something we’re hoping will work well for us. We haven’t pulled it off yet but we’re hoping to shortly. I know that Southern California Kaiser has pulled it off. In terms of challenges in implementing population health with clinical decision support, you definitely need to prioritize the kinds of things you present in the EMR. Leslee, Farzad, Terry and all of you have been talking about there only being a limited number of intrusive alerts that physicians will tolerate. We got so much more of a bang for our buck out of a flexible panel support tool which allowed the health care teams to prioritize the work as they wanted to and gave them the tools to slice and dice their own populations. That seemed to resonate much more with our primary care health care teams than the intrusive alerts did.

Thank you all. I don't think I see any more questions so I think we’ll leave a little bit early today.

I want to thank our panel again today with a great presentation and an engaging discussion. I would like to remind participants that there will be a poll coming up on the bottom right hand side of your screen. Please fill that out and it will give us feedback for future teleconferences. The slides should be available in the next couple of weeks on the National Resource Center for Health IT website. And I want to remind you that we'll have our fourth teleconference in the series coming up in January.

Thank you all.