

# MANAGING PATIENT CARE TRANSITIONS: HOW HEALTH IT CAN REDUCE UNNECESSARY RE-HOSPITALIZATION

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I want to welcome everybody to today's AHRQ National Resource Center for Health and Information Technology event. The title of our event today is Managing How Health IT Can Reduce Unnecessary Rehospitalization.

You will be hearing from three presenters today in healthcare safety: Dr. Brian Jack, who is with the Department of Family Medicine at Boston University School of Medicine at the Boston Medical Center; and finally, Dr. Terry Field with the University of Massachusetts Medical School. Welcome to all of you, and at this point I want to turn the podium over to our first speaker, Dr. Stephen Jencks. Sir, the podium is all yours.

DR. JENCKS: Okay, and welcome. What I am going to try to - is to give you a picture of the problem of rehospitalization and why - up. The starting point in this discussion needs to be an understanding that what we are interested in is not really just rehospitalization. It is rehospitalizations which result from system failures in the transition from hospital to the next source of payer.

And the reality that we are increasingly facing - cause the clinical deterioration that utilization (ph). And let me be clear here that our aim is to prevent clinical deterioration. Our aim is not to have somebody stand at the door of the emergency room and (inaudible) system. It is a question of patient experience. It is urgent, as we well know from the discussion now going on about healthcare costs, and there is a growing momentum for change; I will talk a little bit about that.

Now, the first point, the safety issue, fee for service Medicare at that. They are beneficiary in (inaudible) hospital in 30 days - the - percent who are rehospitalized that should concern us. These are very - service medical discharges are going to be dead or within a year and half of surgical discharges are rehospitalized within a year.

For Medicare - and therefore they are targets for prevention - contrast, but there is a 10 percent which appear to be a much more part of a planned program of treatment. And though there may be questions about them, they are not the result of transition failures and they are not going to respond to the kind of thing we are talking about here.

So we do not know what savings are possible, but clinical trials, and you are going to hear a bit about those in a moment, suggest that 20 to 50 percent of these rehospitalizations are probably preventable.

Now, in addition to this, patients do not like the experience of transitioning from a hospital to further care. When I ask people how they would rate the most recent experience that they or a relative has had, there are a couple of Bs, and mostly they are giving Cs, Ds, and Fs.

So the confirmation of that is from the HCAPS data, which tell us that the patients do not feel that they have been given the information they need in order to take care of themselves when they go home, and that in fact in this startlingly large number of cases, they cannot remember anybody even asking them if they need help.

So that is what we are up against. The other side of this is that rehospitalization is an enormous opportunity. This is probably the place in the healthcare system where there is most readiness and will to do something about the fragmentation of care that is involved, the failures of communication, the failures of planning, and the failures of execution. It is a major opportunity. We have, quite literally, hundreds, I would guess over a thousand hospitals now working on this problem, and that is unprecedented in terms of people trying to fix a piece of the fragmented healthcare system, so it is a great opportunity. On the other hand, if we cannot fix this, our chances for fixing the larger problems in the healthcare system look a bit bleak.

So I mentioned that a bunch of hospitals are working on this here. You notice (ph) I said a thousand before; that includes a very substantial number of individual hospitals. This is hospitals engaged in collaborative group of projects, see that there are 14 communities; those are QIO projects, three states; that is the IHI. Common (ph) to that, there are projects that - just the American College of Cardiology, hospital-to-home project, and the Society for Hospital

Medicines Boost project.

Now, finally in this introduction it is important to recognize that this is not just a Medicare problem - is that the number of non-Medicare 30-day rehospitalizations is about equal to the number of Medicare 30-day rehospitalizations; that is a very crude figure, but I would be astonished if it were not in that general ballpark.

That means that every year we are seeing about five utilizations (ph) of which two and a half million are Medicare and two and a half million are non-Medicare. Some of them, such as med - often have even higher rehospitalization rates.

Now, let me at this point transition to (ph) be the basis for the rest of our conversation. These four goals are borrowed from Harlan Krumholz at Yale and from the hospital issued (ph) for what they laid out. The fourth is one that I added. Think of it (ph) in terms of what IT can - but a - that IT is enough involved in the - in managing of medication and pharmacy activities, so they have got to be a part of the solution to the problem of medication reconciliation, reconciling what the patient is supposed to be taking with what they were taking and what (inaudible).

And so that is item number one; it is a huge source of - The single largest reason for rehospitalization connected to transition, as best we understand the data, is problems with medication.

Second, every patient and fam (ph) - knows the signs of danger and knows who to call if those danger signs occur. It is right now an uncommon occurrence for a patient to be able to tell you who they are supposed to call if - again, I think IT has real things to offer here in terms of these communications.

Third, every patient in the family has a prompt follow-up process that is of getting appointments for people who are leaving the hospital ward [and you consider] (ph) someone in the - kind of like late (ph) middle ages. Whether IT is going to be able to help us with this in the near future instance (ph) we are in an enorm (ph) - Sure you are going to be hearing from Brian Jack in a few moments about a pioneering effort to make that work and happen, an IT-based effort.

I would add to that exciting (ph) part of Brian's work in this area may well be the use of - to assess the patients' understanding so that one know what patients do not have best (ph) they need in order to take care of themselves when they go home.

So you can take this whole thing and shift the framework and talk about uses for IT, the transmission of information, for example, not mentioned in the list because it is not a goal for what the patient knows, is that the information of the hospital compiles at discharge be immediately available, whether it is to a nursing home, a home health agency, or a physician. And we know what currently happens around the area of dictating narrative summaries. That is something that needs to be reengineered itself.

Second, IT can be very useful, and I do not need to lecture you on this, in making it easier to assess risk and to identify the patients that should be targeted for intensive interventions that may be more expensive but will be critical for them.

Third, and this is where Brian's computerized agent has a special role that they just - is instruction and assessment of patients. The fourth is the ability to bring patients and caregivers into the care planning process. We know that this is an exciting frontier, though it is not yet clear how ready it is to go national.

And finally, IT should be able to give providers near real-time feedback: "Your patient, who was discharged seven days ago, has been rehospitalized, and here is what appears to have happened that led to that rehospitalization. By the way, you can find her in Room 417A."

So with that, I am going to turn this over to Brian Jack, who will discuss with you Project Red and this accompanying embodied agent.

BEGIN AHRQ – SECOND SPEAKER

SPEAKER: And hello to all of you who are joining us for this conference today. I am going to be talking about our

project, Reengineered Discharge, and from the focus of rehospitalizations from the clinical sharp end; that is, as a clinician who discharges patients into the community often knowing that the plan that is set up is bound to fail, and why do we keep doing that?

And also from the perspective of a clinician who accepts patients back into their clinic who have been in the hospital not always knowing what has happened to them and able to make the right decisions for that patient, right, (ph) because the information forward is not right.

And when referring to those hospital discharges, the perfect storm of patient safety, in the sense that, as Steve has mentioned, there is a lot of them, in fact, a real lot of them, and they cost a lot of money. In fact, a real lot of money. And that there are many, many patient safety issues that have been documented in the literature over the past five or six years showing that the job that we do at the time of patient discharge is of very poor quality; that there are loose ends, as there are workups that are to be done after discharge are often not done.

Communication between the hospital provider and the source of care in the community is very inadequate. The discharge summaries are often poor. There is poor preparation of the patient in terms of what they know about their medicine, how to take their medicines, and what do they understand their medicines. Fragmentation of care after discharge and great variability of [each other] (ph) stated that depending on the day of the week that you are discharged - if you discharge on the weekend, you are more likely to be rehospitalized, partly perhaps due to the quality of the discharge information.

So it is no surprise that 19 percent of patients have a post-discharge adverse event. And as Dr. Jencks (sp?) and his colleagues have shown us, the 20 percent of Medicare patients are readmitted within 30 days, and only half of those patients have had a source of primary care or ongoing care within the 30 days prior to that readmission.

But it is not just patient safety that gets us all together today to talk about this issue, because there are enormous financial implications that are on the horizon. And indeed, the financial implications of rehospitalization impact enough on healthcare, which impacts enough on the economy. But it is a fair statement to say that the economy of the country can be impacted by our improvement in this area. Estimated 17 billion in the private sector, 17 billion in the public sector perhaps could be saved each year.

And guess what? The Obama Administration has done the math and has said that hospitals with higher rates of readmission would pay less if they are readmitted to the hospital within the same 30-day period of saving, in their estimate, 26 billion over ten years. The Medicare Payment Advisory Commission recommends reducing payments to hospitals with high readmission rates.

And as Dr. Jencks mentioned, there is a lot of implementation demonstration projects now going on that includes the CMS QIO projects around the country, the IHI projects besides hospital medicine projects that - American College of Cardiology project and others that are growing now.

And if you do not know how well your hospital is doing, everybody else does, because all you need to do is to go onto hospital-compare websites to see how your hospital compares to the norm, to see if you are above or below or whatever hospitals are doing, and people are now able to access that information.

So a few years ago we were very interested in this topic of can we prepare people better at the time of discharge? And using multiple methods borrowed from engineering and patient safety movement, we delineated what we think is the take-off checklist. It is like the airline pilot; when they take off, the pilot and the co-pilot go through the take-off checklist. There was never really anything similar to that for patients leaving the hospital, and that what the Reengineered Discharge checklist is. And it is medication reconciliation prior to discharge, reconcile the discharge probably with national guidelines.

Now, we know that lots of patients are not on regimens that follow national guidelines, but why not be sure that they are on an aspirin and not a beta blocker, on an ACE inhibitor, if they have indications at the time of discharge?

But everyone has a follow-up appointment to follow up on the reason that they were in the hospital and for their other

chronic medical conditions. But outstanding tests, tests that have been done in the hospital, that there is a plan for who is responsible for following up, and that they are indeed followed up after discharge. The post-discharge services like DNA and cardiac stress tests and other things like that are organized.

But very importantly, there is a written discharge plan; now, that is in contra-distinction to the discharge summary, and the discharge summary is for clinicians. The discharge plan is something that the patient takes home that explains to them what they are supposed to do when they go home to take care of themselves; what to do if a problem arises and how to contact their provider; patient education about the medical condition that they have and why it is important to them and the importance of taking their medications; and as Steve mentioned, assessing the patient's understanding of the plan. And if they do not understand, then we need to do something a little bit different so that the things that are supposed to happen in the plan are actually happening.

The discharge summary needs to be completed and needs to be done right away and it needs to get to the primary care provider or the source of ongoing care prior to the first appointment. And then we believe the telephone reinforcement within two or three days after discharge is also important and that is part of the intervention that we studied.

Now, this list of components was adopted by the National Quality Forum. [Not really adopted] (ph), but the National Quality Forum asked me to write the safe practice on the discharge and that the National Quality Forum safe practice parallels the Reengineered Discharge entirely.

So then we said, you know, if the National Quality Forum was recommending that all the people who are discharged from all the hospitals in the country get those package of services, shouldn't we do a study to see what the results would be to convince hospitals if this is necessary or to show that this is something that is not necessary?

So we enrolled 750 patients and random - an intervention group which received the 11 components of the Reengineered Discharge versus usual care, and then 30 days later measured their outcomes, which was primarily emergency room visits, rehospitalizations, and something called total hospital utilization, which is combined ED visits plus hospitalizations. And the enrollment (inaudible) are listed here, but there is no reason to think that the study would not be effective in other groups as well - now because it does show that it is effective in most other groups.

We operationalize the Reengineered Discharge using this thing that we call the after-hospital care plan, which pays attention to health literacy. It needs to be called the discharge plan, but then people were very confused about, you know, runny noses versus their after-hospital care plan I think by that, so we changed the name.

We had graphic designers look at it and health literacy experts and lots of people in focus groups and all to look at designing something that people understand what it means, the pictures of the doctors, et cetera.

The medication section of the after-hospital care plan is divided with icons for morning, noon, and night and that sort of thing. What is the medicine, how do I take it, and why am I taking this medication? It does not have the physiology and there is no Latin and there is no mechanism of action and that sort of thing here, and people seem to understand that. And then pictures of their doctor and people to call on who are in the clinic if they have questions about what to do.

There is another section of the after-hospital care plan that has appointments in it and that they are color-coded to a calendar that I will show you on the next slide. But the first one is with their primary care physician, where it is, what it is for, and what to do if they need to change the appointment, et cetera.

And we have the discharge advocate, which the nurse that does this work in our hospital, training manual. And the training manual does not just say be sure they have an appointment. It is a process for determining what days they can make it, what days they have a ride, what days they cannot make it. So the appointments that they have are appointments that they can actually keep, and that is very important for decreasing rehospitalizations.

For the cardiology appointment, nutritionist, cardiac stress test, et cetera, whatever it is that they have to do, the bottom slide is pending tests, so the patient takes some responsibility, then, for being sure that somebody follows up that H. pylori test, for the biopsy, or whatever it is that has been done in the hospital that can and we know is often

overlooked.

The calendar is the next page, and it is color-coded to the appointment, so the patients go home with a magnet that they can hang it on their refrigerator, and it has what they are supposed to do for the next 30 days and the days that they are supposed to make appointments, et cetera.

In the study, cutting to the chase, our study showed that for readmissions in the usual care group in 30 days there were 76 rehospitalizations, which was the rate of rehospitalizations over the past three years at our hospital, and we are able to decrease that to 55 readmissions and cut it down by 25 percent. For ED visits, it was reduced from 90 to 61, and total hospital utilization, which is the sum of readmissions or ED (ph) visits decreased from 166 to 116, and highly significant difference in reducing hospital utilization.

When we look at cumulative hazard rate of patients experiencing hospital utilizations, the blue line is the usual care rehospitalization rate over the first 30 days after discharge, all-cause rehospitalization rate, and the red line is the Reengineered Discharge which shows a highly significant difference in hospital use.

In terms of costs, the hospital visits decreased from 412 to 268 because there are a lot fewer of them. The same thing for the ED visits; decreased because there were fewer of those. The PCP visits increased, so that cost was greater. The total cost per group, the total cost per subjects... The bottom line is that that the study saves \$412 per patient enrolled, and the number needed to treat was seven. So for every seven people who are enrolled, one of them did not come back to the hospital in the 30 days after discharge, saving \$412 for everybody.

So now the purpose of today's talk is to say how is it that we can assist providing a comprehensive discharge using health information technology? Now, we knew all along that we believe that the Reengineered Discharge done by a nurse will not add significant time to the nurse's day. In fact, it is possible it could even save a little bit of time if the after-hospital care plan is produced automatically, which we are now able to do.

But we also knew that if the easier we made the system for nurses to provide, the less culture of hospitals we had to change, change people's job descriptions and things like that to do new activities, the more likely it would be the people would be willing to do the Reengineered Discharge in hospitals.

So beginning about five or six or seven years ago now, we worked with people from the media lab at the Massachusetts Institute of Technology. Tim Bickmore was a registrant (ph) at that time is now a professor of computer science at Northeastern. And Tim has invented this technology called the embodied conversational agent, and you can see Louise and Elizabeth there.

And it is important to note that these are not videotapes; that these are characters that are really unique in the sense that they can speak from a database. So that we collect information on patients, the information goes to print their hospital care plan, and that information also goes to the embodied conversational agents who then go to the bedside and teach the after-hospital care plan to the patients. But we now have enrolled about 500 patients in a randomized control trial, having Louise and Elizabeth teach the after-hospital care plan rather than a nurse, and we will tell you the results of that study within a few months.

But the embodied conversational agents emulate face-to-face communication and they develop a therapeutic alliance using efficacy-gauged posture and gesture, and this is Tim Bickmore's area of research to be able to design characters that can actually talk with empathy. We have programmed them to teach the Reengineered Discharge, and specifically of the after-hospital care plan components.

Very importantly, as Dr. Jencks mentioned, Louise and Elizabeth do something that we hardly ever do, and that is to test people's competency prior to going home. And then Louise and Elizabeth print out a report if patients are unable to understand how to take their medicine or unable to keep an appointment, et cetera, or unable to understand any other part of their discharge plan. And that goes to the nurse, and the nurse comes in and uses a human brain at the end to solve those specific problems.

So Louise and Elizabeth give a test to the patient after teaching the medications and say, "Okay, can you tell me how

many times a day you take your Lisinopril,” and they have to get it right. And there is lots of scripts that we go through, and if they get that wrong, and to try to teach them how to read the plan as best they can.

The patients can also drill down as much as they want to in terms of as a physiology mechanism of action if they are interested in that. But what we do is mostly is to teach them free information: What is it, why is it important, and what do they need to do for it, which is what people really want to know.

Also part of Louise and Elizabeth do is take the math, which is part of the after-hospital care plan - because we found that some of our root cost analyses and other things - that there are a certain number of patients who had, for example, a stress test scheduled after discharge, and they would go to the wrong part of our fairly big campus and miss it. And there was one case where they missed the appointment and finally, you know - they went to the wrong place. By the time they got to the right place, it was too late to have it and that patient next presented with sudden death.

So knowing where people go for tests, but also where their community health center is, where the doctor's office is, where the consultants are, Louise and Elizabeth can explain that to them through a special module for high-risk medications that are listed there so that they spend extra time about how to bridge Lovenox and to give insulin and things that are likely to have people end up back in the hospital.

Now, as we design these products, we actually videotaped our own nurses - this is one of our own nurses talking to real patients - and videotape them and then scripted those interactions of how real nurses actually teach the after-hospital care plan in writing the dialogs and the algorithms for Louise and Elizabeth to do the same thing.

We have developed now a workstation which is really a software program with dropdown menus, which the nurses can sit down with and complete the information necessary to go into the after-hospital care plan, and that this software can automatically print the after-hospital care plan now.

And we are working, and in several hospitals we have been able to connect the workstation to the hospital IT environment so that as much information as possible could automatically go to the workstation so that there is as little redundant information entry as possible. The nurses go in and enter the few things that need to be done for the discharge, push the button, print out the after-hospital care plan, give it to the patients, wheel in Louise, and Louise then teaches the after-hospital care plan to the patient.

So the information is entered into the workstation, the after-hospital care plan is printed automatically. The information goes to the kiosk, which is then wheeled into the room where the patient then watches Louise and has her own after-hospital care plan which is identical to the one that is being described on the screen. And then afterwards Louise prints out a report about whether the patient understands it, can keep the appointments, et cetera.

Here is a picture of what it looks like. The kiosk is on a flexible arm that extends over the bed. There is a weighted base so it does not fall over and it is on a touch screen, so that is how the patient interacts with Louise. A lot of people ask about what about elderly people and can they do it. And what our nurses are trained to say is that if people raise questions about am I able - you know, “I do not know much about computers,” we say “Give us one minute,” and if at the end of that one minute you do not think you can do it, then you do not have to.” And then we just push the button and Louise comes on and says, “Hi, how are you,” and something will come up and it will say, you know, good or bad or something. And patients - and we say “Go ahead and answer,” and they answer, and then Louise just takes off from there, so not a single person has said after one minute that they are unable to do the system.

We do have earphones, so for people who have trouble hearing, and also for privacy issues, so we can turn up the volume sometimes so they can be sure to hear what Louise has to say about their own personalized discharge plan.

Carl (ph), at this point, if you can, we have a short videotape to give people a little glimpse of what the system looks like.

SPEAKER: Yes, very good. Make sure your speakers should already be turned up, but go ahead and turn them up. You are - want to turn them down so it is not broadcast over the system, and I am going to bring up that video now to play for everybody:

ELIZABETH: Good afternoon. My name is Elizabeth, and I am here to help you with the discharge process here at Boston Medical Center. You are John, is that right? It is great to meet you, John. As you might have noticed, hospitals are very busy places. My job is to make sure that before you leave you feel that you have been given all of the information you need to help make the transition from here to your home as smooth as possible. So are you a Red Sox fan? That is awesome. I would really like to see a game some day, but they do not allow computers at Fenway Park.

Anyway, so how are you doing today? That is too bad. Tell me more about how you are feeling. I am sorry to hear that. I bet that it is hard to feel sick and it is not fun to be in the hospital. I hope you begin to feel better soon.

I will now be going over some information with you. It looks like you are going to be leaving the hospital soon. I know you must be looking forward to leaving the hospital, but before you go I want to review some information with you.

This is a care plan that we created just for you. Remember to bring this booklet with you to all of your doctors' appointments. On the front, it has your name, and this is the day we are hoping you will leave the hospital. Down there at the bottom it has the phone number of your discharge advocate. A discharge advocate is a nurse here at the hospital that makes sure you have all the information you need before you go home. You can call them if you have any questions about this booklet. It also has the name and phone number of your doctor.

This page is a list of the medications that your doctor has prescribed for you. For each medication, the reason you are taking the medication is written here. Here is the name of the medication. Sometimes you might see two names listed here. That just means that the medicine can go by more than one name.

Moving on, here is the amount of the medication that you take, and here is the way you take the medication; for example, by mouth or injection. The medications are color-coded based on what time you take them. As you can see, morning medications will be in yellow. Medications in purple are the ones taken at bedtime. Those are all the times you will take medications.

Before I go over your medications, there was general information that I would like you to know. Make sure you tell the doctor all the medicines you are taking. These can be medicines that your doctor prescribes, medicines you get without a prescription, herbal medicines, or other supplements like vitamins that you might be taking. It is important that your doctor knows all the medications you are taking because some medications can be dangerous if you mix them together. Make sure you continue to take your medicine as directed by your doctor, even if you are feeling better. Stopping your medication without being told to do so by your doctor may cause problems and can make some illnesses harder to treat.

All right, let us talk about your first medication. Your doctor has prescribed Protonix, also known as pantoprazole. This medication is for your stomach. You will take one pill of Protonix in the morning. You will also take one pill of Protonix at bedtime. You take this medication by mouth. Do you know how to take medications like this? Would you like to hear some more details about this medication? We are done with Protonix.

SPEAKER: Yes. I think we could maybe stop now. I think people probably get the idea.

SPEAKER: Okay, and just in case it did not play for anybody, we will also make that file available so that you can download that later.

SPEAKER: Okay, yes. The link to that segment is on the slide, so if you have the slide you can just actually cut and paste the link right there into your browser and you can watch the entire clip if you would like anytime.

So in some of our pilot studies, we asked people about how they liked using Louise and Elizabeth's system. So we did one study which was with healthy volunteers, not with sick patients in the hospital, and we asked them "How satisfied were you with Louise on a 1 to 7 scale," and they said 6.7. "And how helpful was Louise?" A 6.5. And then "How friendly is Louise?" 6.7. And "How informative was Louise?" 6.8. And "How much do you trust Louise?" 6.7. And you can see the others are also high.

But people liked the information, and the key thing is that Louise has plenty of time; that she goes over and over again the medicines, asks do you understand it, do you want to go over it again. And people comment all the time about how Louise is not in a rush. In fact, when we asked the question “Who would you rather receive discharge instructions from,” people say things like “I preferred Louise. She is better than a doctor. She explains more and doctors are always in a hurry.” Or “It was just like a nurse, actually better, because sometimes a nurse just gives you the paper and says ‘Here you go.’ Elizabeth explains everything and takes...” The time element is what people continuously bring up.

It is also possible that computerized agents and information technology systems like this could actually be more effective than people in some contexts in that they rely minimally on text and that handing people a patient information sheet out of the PDR does very little good in terms of patient education and for them to know what to do.

But using multiple nodes of many channels of information, it has been shown to enhance recall. So saying the words, having facial expressions and empathy with multiple channels of information can actually enhance recall. Listeners pay attention to not only the words, but also to the gestures, and that the gestures can emphasize those things that are important for them to remember. It is not a videotape lecture in any way at all, because it is absolutely specific to that patient’s clinical characteristics and discharge plan, relative to medicines, the appointments, the physicians, the pictures, and all those things.

And Louise, the fidelity (ph), Louise can do it all day long, and she can do a good job every single time. And that people, no matter how much they want to, simply do not do a consistently good job every single time, day in and day out to be cost effective, because it is less need for clinician time, easy to use, and there is no time limit.

And what we essentially find is that if a nurse is going to spend 15 minutes talking to a patient on what to do when they go home, when their family comes, they are not going to spend another 15 minutes discussing it. But with Louise, the patient can spend time. And if there is four medicines, four appointments on average, depending on which direction the algorithms people go, it is about 20 or 25 minutes.

But a family member could sit down and then review exactly what their elderly mother or father receives in terms of discharge instructions when they come to pick them up, et cetera. And importantly, as it has been brought up, Louise knows what - can assess the competency and understanding of what they are supposed to do when they go home, and if they do not understand them then those problems can be fixed.

Our current work now with our - through the ASQ, Ambulatory (ph) Safety and Quality mechanism, is - and with Tim Bickmore, our colleague - is to develop an online system so that when patients leave the hospital they can go online and meet up with Louise or Elizabeth because they met in the hospital. And we are programming the characters now to reinforce the discharge plan and with the ability to hopefully enhance adherence for medications, to monitor really in real-time, on a daily basis, adverse events, and to identify potentially adverse events and to identify who it is that needs a phone call from a real person for things that are either confusing or for potential adverse events and those sorts of things.

And the system is being set up to go from the time of discharge to the first post-hospital visit, to get them through that time of self care through the black box until they are seen in that first appointment. And that the discharge advocate nurses will get any flags that come out of that system, any alerts that come out of that system on a daily basis, and call back patients who want a phone call for one reason or another, and we are beginning a trial of that system as well.

So in conclusion, the hospital discharge is real low-hanging fruit for improvement. There is a lot of elements, it is really expensive, and there is lots of problems associated with it; we can really do better. The Reengineered Discharges is one attempt at devising a comprehensive hospital discharge program that is now a National Quality Forum safe practice; that when the RED is delivered using the after-hospital care plan tool, it has been shown to decrease hospital use by 30 percent, the number of need-to-treat is seven, and saves money.

And then health information technology can emulate what we did in the RED trial, could improve the delivery, could save clinician time and further improve cost savings, and build the business case (ph) for providing comprehensive hospital discharge to all of our patients.



And so this is my e-mail and our website, where there is more information about our program and our IT partner, who is helping hospitals to adapt the workstation to their hospitals and to implement Project RED in different places if you are interested in that.

So I would like to thank you for your attention, and we can move on to Terry Field.

SPEAKER: Well, and thank you. And before we move on, I just want to point out that I know we are running a little bit long, so I just want to point that out for our speakers. And if you can move through your material, we certainly appreciate it.

TERRY FIELD: Hi, folks, I am Terry Field. And first of all, thank you so much, Brian. I really enjoyed watching this presentation, so I do not mind that it ran long and I will try to stay short.

I am basically going to be coming at this discussion from a couple of different directions that may shift things from what you have been hearing up until now. First of all, I am going to be talking not just about hospital discharges, but primarily about discharges from skilled nursing facilities, a situation in which there is even more complexity and the patients themselves are usually even more complex.

Secondly, I am going to be coming at this from a research background, which started from the point of view of looking at patient safety issues and eventually work their way to looking at transitions because they seem to underline some of the patient safety problems that we had previously seen.

And third, this focus is primarily going to be on the information flow among providers rather than the information given to patients, although I strongly suspect that the system that Brian has been working on is probably going to be easier to move out into the primary world of the hospital setting than what we are going to suggest, but let me take it from the top here.

First of all, our patient safety research with we have been conducting in the ambulatory setting for a number of years now has been focused primarily on adverse drug events, which frankly are one of the most common problems that afflict patients in the ambulatory setting.

And real quickly, we began by looking at adverse drug events over the course of the year among older patients who are being treated by a one large multispecialty group practice. With each adverse drug event that we found, we tracked that to try to figure out if that adverse drug event was preventable in some way, and that usually meant was there an underlying error that could be at least a partial cause of the adverse drug event.

When we looked more closely at what errors led to the more serious of the preventable adverse drug events, they fell into certain particular packages primarily related to either inadequate measuring, monitoring, or failure to act on monitoring. Also a large chunk with drug interactions, conflicts with patient condition, and excess dose.

A few years after this study, we had the opportunity with funding from ARC to actually set up panels of physicians from the group, nurses, pharmacists, and clinical support staff to develop fault-frees (ph), one for each one of these types of errors, to try to understand better what was going on in the overall system of care that might be leading to the problems we were seeing.

And over and over again on these fault-frees, a major important component of the problem was inadequate information about patients who were being discharged from hospitals and skilled nursing facilities, so we moved on with our current ARC project to look more closely at this.

And frankly, we are doing two separate studies, one of which is hospital transitions and the one that I am primarily focusing on in this presentation, which is a transition from skilled nursing facilities.

So we are starting with the fact that most of the patients who eventually wind up in skilled nursing facilities have fairly complex medical conditions to begin with. They are living at home under fairly difficult conditions medically. Eventually they create - they lead to a crisis which leads to a hospitalization.

In many situations, increasingly there is a push to try to get people out of the hospital as quickly as possible for a number of reasons, one of which obviously is the cost. Then if the patient is unable to go directly home from the hospital, there is an increasing use of skilled nursing facilities for short-term support during that transition.

Eventually the patient does return home in most cases. By the time they return home, they have had a change in their clinical status, they have new medications, they have new needs for monitoring, and as we have seen over and over again, they are at high risk for having adverse events.

I will tell you they also appear to be somewhat confused by this point, because they have probably heard different things from the person who picked them up in the ambulance, to the people who handled them in the hospital, to the skilled nursing facility, so we have a sort of, again, a perfect storm of potential problems.

As we looked at this, the first thing that you see very clearly is that in the current medical system there are a completely different set of caregivers that are dealing with the patient in each one of these settings. In the ambulatory setting, it is usually the primary care physician who is mostly responsible. Once they move into acute care, it is specialists, and in many situations hospitalists, it is very rare now, at least in our setting, for the primary care physician to be specifically following the patient while they are in the hospital.

After they come out of the hospital and go into the skilled nursing facility, we move onto a situation where the skilled nursing facility geriatricians are handling the patient, again, usually without a lot of interaction with the primary care physician. Once they are back in the ambulatory setting, we are back with the primary care physician, and frequently for these patients we are adding in a visiting nurse as well.

The key components of this transition process which has been detailed in previous research include, first of all, close follow-up after the discharge. Secondly, a timely transfer of health information, including particularly medication lists. And finally, communicating all of the needs that the patient now has to all of the healthcare professionals who work with the patient, including particularly medication monitoring recommendations and needs for medication education.

Unfortunately, in most systems, including the one we are working with, there are huge gaps in that need for components for transition. First of all, there is a lack of follow-up. In many situations, the primary care physician may not even know the patient has been in the hospital or the skilled nursing facility. Second, there is frequently no information, and I think we are all familiar with this problem, no information transmitted about any changes in medications. Third, because there are different electronic systems and paper systems that go along with these different settings, there is frequently no recognition of possible drug interactions, needs for monitoring. Monitoring tests that were administered where the results are not yet in, these things just sit with the individual sites rather than passing from site to site and allowing recognition of what might have happened that would cause problems. And finally, there is usually inadequate information to allow though the out-door (ph) ambulatory care providers to actually determine what kind of needs there are for patient education.

There are enormous potential roles for health IT. Whether or not they can actually fill these gaps is another question, but there are certainly are possibilities. If there is a way of connecting the electronic systems for among these sites, there is the possibility to automate the scheduling of follow-up visits.

It is also possible to automate the transfer of information about medications. It is possible to provide consistent information to all of the healthcare professionals who work with the patient. There is the possibility of developing alerts to primary care physicians about the needs for monitoring and patient education on newly discharged patients. It is possible to automatically identify drug interactions, documented allergies, conflicts with lab test results and patient conditions, and needs for monitoring.

It is possible to alert nurses, including visiting nurses, about the need for patient education, and you can automatically generate specific individualized support materials for the patient and the family.

In our study, we are looking at the very specific setting. This is a setting in which it is a multispecialty group practice. Now, believe it or not, this system actually has primary care physicians, hospitalists, and the geriatricians in the SNFs

all working for the same group practice; however, that has not solved the problem that I detailed earlier. The information still is not flowing across these people.

We do have an electronic medical record system which functions in the ambulatory setting, and part of our process has been to try to make that system also connect to the SNFs through Wi-Fi and laptop computers, and if possible, to the main hospital that we are working with; that has been the most difficult, to be honest with you.

The patient panel at this multispecialty group practice includes many older adults with complex medical needs. The practice is linked to its primary insurer. Its primary insurer is very aware of the cost of hospitalizations and rehospitalizations and has focused on providing a lot of use of skilled nursing facilities to shorten hospital stays. And the system has specific contracts with several large visiting nursing associations who are very interested in becoming more fully integrated with the process of care at this group practice.

So our current project; we are currently in the process of running a randomized trial. In this trial, the geriatricians at the skilled nursing facilities are going to be performing medication reconciliation in the electronic medical record at discharge. We are also training these SNFs, geriatric nurse practitioners, to have some backup support. This will be used in Wi-Fi and laptops at the skilled nursing facilities.

A background program has been developed which will automatically identify from this medication reconciliation, drug interactions, allergies, conflicts with the current conditions and lab results of the patient, and needs for monitoring. It will generate e-mails to the primary care physicians with information about the discharge, about the patient's current conditions, and all of the alerts. There is an automatically generated e-mail to the clinic scheduling staff with a need for follow-up visits and we will automatically be generating information for the two major visiting nurse associations with the same information that is being sent to the primary care physicians and with information about helping the patients to follow up on the need for their visits.

We are going to be evaluating this process by looking not only at readmissions, but also specifically looking at the incidence of adverse drug events during the 45 days after discharge. We will be looking at the extent to which timely follow-up can be accomplished under this condition.

And possibly most importantly, we are going to be looking at the cost of development. It is already clear to us that the programming alone is a very expensive and probably will turn out to be a very expensive part of our process, so it is going to be critical for us to understand whether those costs are offset by the advantages that we find.

So that is what we are in the midst of, and I think the skilled nursing facility situation is an important piece of the puzzle which may at least partially deal with some of the problems with early discharges, but which then produces its own set of potential issues, so I am hoping that we will be able to come up with some solutions that will assist making that part of the peer process more effective and less dangerous. Thank you. Dr. Jencks, I think it is back to you.

DR. JENCKS: Thank you very much. Briefly we are going to finish this up by, if you will, a slightly philosophical - the point. And that is that we are really talking here about trying to put the community together from a bunch of quite fragmented groups that do not talk very well to one another at all. This is what Terry has just been emphasizing, and I said I think it just needs to be underlined again and again.

And we are trying to change a culture. This is not just a technical problem. It is probably not even primarily a technical problem, but it would make it easier with technology; things are going to be a lot quicker and a lot less traumatic.

The phrase is it takes a village. It takes a community of people to take care of a patient, and those people need to communicate. The handovers will need to be seamless. And at the moment, we are dealing with something that has slightly nightmare quality that maybe IT can help us with.

The community building part of IT has several parts. One is that it provokes information sharing, and the second is that it brings the people who share the information through the network somewhat closer together. And the third is it defines the patient rather than the individual provider as the focus of the information. That is really important. It is

really difficult.

To give you one very brief example, CMS developed the Cares (sp?) tool, which was intended to make risk assessment for people who were leaving hospital for post-acute care somewhat easier to transmit from the hospital to the next source of post-acute care. It is being used in a demonstration, and the demonstration actually may be close to an endpoint. But it has not been possible to take it beyond that demonstration setting, because the privacy issues seem to be very intractable indeed.

Here we have something that is an Internet-enabled way of putting information about a patient in a place where it can be easily accessed by the next source of care, and our present rules make it too complicated to do it. That is going to be a growing issue. And if you think that IT has privacy issues, let me tell you, this is not going to make them smaller; it is going to make them worse, and the reasons for that are almost endless.

But what I want to do now is to just talk a little bit about how this process might be able to go forward, and there what I want to say is two things: One, we have to acknowledge the magnitude of the problem. And the fact that facing up to this problem is going to be very hard for institutions. It is a major movement, and I think a lot of institutions will have little choice but to face up to it.

But what we are dealing with is twofold: One is problems caused by putting the scheduling and convenience of providers, including physicians, ahead of the patients' need for continuity and coordination, and that is really manifesting the problems that you get when you try to get somebody a post-discharge appointment.

And secondly, an implementable tendency to blame patients when the thing does not work well so that patients get labeled as uncooperative or noncompliant when the problems range from complete failure to explain things given to them to help illiteracy to lack of the financial resources to do the things that they have been told that they need to do. And we need to understand that changing that culture is going to be a real challenge for us.

The second piece that I think is important is that we know that IT and the community, it helps to create the communication. It helps to create our going in the right direction. We know the sense of direction we should go, but we are uncertain how far IT can take us, because we have not got enough experience in field tests and we have not got enough experience in that crucial ingredient: Spread.

So I want to then say that then it is going to take guts. It is going to take courage. This is going to be, in one sense, welcomed by your professional colleagues, but in another sense, it is going to be uncomfortable in this well fit (ph) and the people who are reasonably comfortable in the status quo will not be happy. On the other side, we have momentum. We have allies as never before. And as Hillel said 2,000 years ago, "If not us, who, and if not now, when?"

I have concluded here by offering you some websites which will introduce you to a number of ongoing projects; they are not intended to be a comprehensive list, but if you want to just do a little surfing you can learn a lot about what is going on by checking these out.

That concludes my comments and I am hoping, John (sp?), that we have an opportunity to respond to audience questions, though I am sure we have been so clear that there really are not many questions to answer.

**SPEAKER:** Well, yes, we do have some questions. Again, if you would like to submit a question, click on the Q&A tab on the console. Type your question in and we will try to get to as many as we can. I do have several here: "Is readmission defined as readmission within 30 days with same or similar diagnosis, or for any readmission within 30 days no matter what the diagnosis?"

**DR. JENCKS:** Yes. Let me try to respond to that, and then I would like to hear some additional comments, but I have published some on this.

This is something in which people's points of view vary. But when I said about 90 percent of rehospitalizations appeared to be unplanned, they cluster anytime as being after discharge and I think all of those 90 percent should be

regarded as targets for prevention, because one of the things we know is that people are generally readmitted for something other than the reasons for the original admission. People who were discharged with heart failure come back with pneumonia. They come back with other forms of heart disease. They come back with septicemia and anything that is predominantly occurring in the weeks and maybe after (ph) discharge, I think the burden rests on us to show whether these - to show that these are not related.

But there is a major group that I think poses a very difficult problem, and that is rehospitalizations procedures. By and large, those procedures are scheduled, they are planned. And while they may represent a utilization issue, they do not appear to represent, for the most part, a transition of care issue, so those may need to be treated fairly separately.

SPEAKER: Okay, thank you. Thank you. Does anyone else want to reply?

SPEAKER: Well, I can just quickly say the hospital-compare website has 30-day all-cause, your hospitalizations, and for specific conditions, cardiopulmonary conditions.

The targets that you look at sort of depends on what the intervention is. I think 30 days is sort of settling out as the number the people are using in the sense that up until 30 days it seems reasonable that what you do in the peri-discharge period may have some influence on care up until that time. After that, it seems as if you are really dealing with chronic disease management once they see their source of ongoing care and are back in the system.

And also between 30 and 90 days the hospitalization rate kind of goes up, and Steve has described it well; that those first 90 days are the most important, so somewhere in the first 90 days you are important and people seem to be settling on 30 days for a variety of reasons.

DR. JENCKS: Let me just add something though. If you look at Brian's outcome for the RED thing, the survival study, those curves are - could be clearly still diverging after 30 days.

SPEAKER: Right.

DR. JENCKS: And in fact, they do not - which I think is astonishing - appear to diverge much in the first seven days.

SPEAKER: Yes.

DR. JENCKS: And if anything, they are in the wrong direction.

SPEAKER: Yes. Yes. And people are beginning to describe, you know, early rehospitalization being the first seven days or first 15 days, and late you mean the last two weeks of the first 30 days, having different etiological reasons for those rehospitalizations, so we have a lot to learn about both what causes them and how to prevent them.

TERRY FIELD: And certainly with our study we are using the 30-day all-cause just as an evaluation mechanism. But I certainly would hope that some of the information flow and the establishment of recommendations for monitoring, et cetera, would have a longer impact than strictly the 30 days, so there are a couple of different ways to think about it.

SPEAKER: All right, I am going to move onto the next question here: "Does Project RED software for the after-hospital care plan incorporate with the care tool?"

SPEAKER: Yes. The software program is sort of the drop-down menus for the nurses or whoever is doing the discharge to enter in the information. Then it produces - push a button and it prints a formatted version of the after-hospital care plan. In the IT system, it is the same workstation or software program, and it also sees the agent so the agent can teach that material.

SPEAKER: Okay. "And is Louise based on artificial intelligence?"

SPEAKER: I do not know really - I do not know really how to answer that. I do not know.

SPEAKER: Okay. "How about multiple languages? Does she have that option available?"

SPEAKER: Working with her a variety of different implementation partners now, one in San Francisco General Hospital, where they have been working with our IT partner, and now are producing the after-hospital care plan in Chinese languages and in Spanish. So it is not so easy - it is not a matter of simply translating things, because there is, you know, programming that needs to be done for that. But yes, it is possible, and it is a priority of ours to do that, and Spanish and Chinese is now available.

SPEAKER: Very good. And we did have one question that came in from somebody that has been involved with writing software and realizes the amount of time and costs to create such a system. Are there any sort of frameworks on how much a system may cost potential users?

SPEAKER: Yes, that is - the answer again is I do not know. In terms of development, we have an RO-1 (ph) from the National - the Heart Line and Blood Institute and a series of grants from our over six years, so I am really glad people appreciate my work. Sometimes when systems look smooth there is a lot going on behind the scenes that needs to be done.

And for Louise, you can imagine Louise can teach every medicine, so this is also a formulary in her. And we had to go through every single medicine to decide, you know, what it is she says and does not say about each medicine, what do people really need to know, and then frame it with health literacy in mind so people can understand what it is that she is saying.

And now with our new system, the after the post-discharge online, or on hand-held device touch screen where Louise can call them up and say it is time to talk again about your medicine and your appointment and things like that, we have to go through all the adverse events for each of the medicines and how to actually detect the things that are coming up.

So I am glad that people recognize that it is a lot more complex to do this than it looks. But the development has been expensive and long, but it is part of research project. And in terms of implementation, you know, we are doing a randomized trial now to see how effective it actually is. And if it is shown to be effective, then it will be available, but I have no idea, you know, how exactly that will happen.

SPEAKER: Okay, well, thank you. And a question came in directed toward Dr. Field: "As we all know, technology, you know, e-mails, alerts, can be overwhelming. Is anyone looking at developing a hierarchy of communications so a provider can sort and know what is critical?"

TERRY FIELD: We have not done it as a hierarchy, but what we are doing is for every one of the alerts that we have developed we are going to a test process. We have two clinicians from the group, two primary care physicians, who every week are getting all the messages that would be generated; they are not being sent anywhere else, but just to the two of them. And we are meeting with them weekly to decide would this message be just an irritant, or would this be a useful message? And we are re-editing all of the messages to only include those that we reach agreed decisions they would be useful messages, because we have had past histories where we have actually tested alerting systems which basically just deluge the user in unnecessary or not particularly helpful messages which did not work.

And we have also done systems in which we were much more specific and careful and they did work, so we are hoping that we are reaching the did-work point with the new set of alerts that we are developing rather than the deluged.

SPEAKER: All right, thank you. Then the next question was asking - saying that at least five states have legislative mandatory UTFs (ph) between settings of care; that is what was being seen in this particular person's state. Is this a basic first step?

DR. JENCKS: Probably not, but it may turn out to be the necessary way to do it. And what I mean here is that the transfer of information between settings is so general a problem that it has been a place where many states have been able to start to standardize things with a lot of support from the healthcare community, and in that sense it is very clearly a good place to start. Start with things you can get support for too (ph).

The reason I hesitate is that until we have done better thinking about what goes into those things, I am not sure that a forum by itself would solve many problems. But there are not people working on that so that it is very likely that in a year or two we will have enough consensus to say yes, that is a vital start.

SPEAKER: All right, thank you. I have another question here asking “Are there any government-sponsored programs for the kiosk technology that was presented, and does this information collected tie into an EMR?”

SPEAKER: Yes. Government-sponsored programs for implementation, not yet. Again, we are still in the randomized trial phase of this, although ARC has been extremely supportive of dissemination science and dissemination of the RED project in general without the IT part of it. And I suspect that if it is going to be effective they will be - they continue to be supportive in terms of dissemination.

Does it fit into EMR? The answer is yes, in that our tech partner has worked to connect the software workstation part of it to several hospitals’ IT systems so that they can collect information and feed systems (ph) - information back to the system.

SPEAKER: Okay. And is it likely hospitals will lose some portion of Medicare reimbursement if their 30-day re-admittance is higher than normal, and if so, do you expect this in 2011?

SPEAKER: I guess I get to do that one.

SPEAKER: Yes.

DR. JENCKS: As a recovering federal employee. There is a language about this I think all of the major healthcare bills, including the ones that have been reported out by House and the Senate. Since it was in the President’s budget message, I suppose it is likely that he will support it.

But by 2011 is way sooner than financial impact was planned in these things. They are talking about publishing a little bit before they do this. But you know, once you have said there is savings to be found, since we have already spent the money, I think we may find that rate accelerates, but the answer to your question is nobody knows. Tell me whether healthcare reform will pass, and if so, in which form, and I will tell you about the payment fee issue.

SPEAKER: All right. Another question: “What percentage of readmissions could be associated with discharge medications? For example, medicine interactions, allergies, missed medications, overdoses?”

SPEAKER: In our experience from our studies, about half are related to medication. And we find it striking that one of the elements of our intervention is that we call people two days later, which ends up to be between two and four days after discharge, and a pharmacist calls them. And at that time, half the patients who have had this extensive health education intervention at discharge are doing something not right about their medicines. Half of them. And when I talk or call [Elinor Hiller] (sp?) and other people around the country, this seems to be about the right number. So even those who have had extensive intervention, when they go home a lot of people are doing something not quite right. Now, that could be they did not get their medicines filled, or they decided they are not going to take their medicine or they are not taking it quite right, or they are taking their Lisinopril, but also their new medicine and their Zestril, and then - and those sorts of things.

On the whole, I believe that we have good data and a lot of lists of the potential problems that happen very shortly after discharge. And we need to do even more than what we are currently doing to be sure the people are taking what they are supposed to take, and medicines are the big elephant in the room in terms of rehospitalizations, in my view.

SPEAKER: All right.

SPEAKER: If you asked me what are the most important things, I would say to ensure people know how to take their medicines, and second is to make sure they have an appointment for follow-up after discharge. And it is astounding as I go around the country to see that how many people are discharged from hospitals who do not have post-hospital

follow-up. It seems to be a lot more common than we would expect.

DR. JENCKS: Yes. That fact, I think it is very important to get away from worrying about the methodology of counting that and recognized that very few clinicians think we are doing very well at having post-hospital follow-up and we just need to fix what people know is an issue without worrying too much about whether it is this percent or that percent that have a problem.

SPEAKER: All right. Well, thank you very much. On behalf of AHRQ, I want to thank our panel of speakers that took their time to be with us today and share of your experience and expertise. Thank you very, very much for being with us.

We also want to make mention of an upcoming webinar. The next event is going to be a webinar examining health information technology and patient center care. Please stay tuned for dates and times on that and where you can go to register.

We want to thank you all for attending this event; it was brought to you by the AHRQ National Resource Center for Health IT. And please stay on for just a few moments and we are going to have a survey that will come up. We are also going to post the questions that were unanswered on the AHRQ NRC website. You will also be able to download a recording of this event and the transcript. And stand by, as I said, and on your screens a survey will be coming up in just a few moments, and that we certainly appreciate you taking a few moments to complete that before you exit today.

We want to thank you all again for being with us and look forward at seeing you at the next event. Please have a very nice day.