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Session: Theory and Evidence-Based Design of Audit and Feedback to Improve Quality of Care

Presenter: Sylvia Hysong, PhD

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Molly: Today we are lucky enough to have Sylvia Hysong. She is a heal services research, I'm sorry, Health Services Researcher and the Director of the PhD Postdoctoral Fellowship Program and Health Sciences Research at the Center of Innovations for Quality and Effectiveness and Safety at the Michael E. DeBakey VA Medical Center. She's also the Associate Director of the VA Quality Scholars Coordinating Center and Associate Professor of medicine at Baylor College of Medicine. So at this time, I'd like to turn it over to Dr. Hysong.

Dr. Sylvia Hysong: Thank you so much, Molly, and thank you, everybody, for being here. It's really my pleasure to share this next hour with you in talking about theory and evidence-based design of audit and feedback to improve the quality of care. So let's see, and hopefully my screen should be showing now. Molly, are we good?

Molly: We are good to go.

Dr. Sylvia Hysong: Ok, wonderful. So I'd first like to start off by, you know, acknowledging all of the collaborators and the funders that have made the work that you're going to see today possible. As you know, it takes a village to do the kind of research that we do, and so there's definitely, in my mind, just those top billing on today's talk. I'd like to start at this, before we start, I'd just like to get a little bit of a sense of sort of what brings everybody here today. So I thought we'd start with a little quick poll and just, you know, get a sense of, so what is your interest in audit and feedback, and you are not limited to a single interest. You can select all that apply. And so maybe you just want to find out what that even means to begin with or maybe you are the recipient of audit of feedback. Or maybe you're the kind, you're the person that needs to give audit and feedback to others, or like me you are scientifically interested or perhaps you're interest was needing to actually design an audit and feedback tool. So let's, pretty quick moment for the poll, and let me know what you think.

Molly: Excellent. Thank you so much. Sorry I had to truncate some of those answers. We got a strict character limit.

Dr. Sylvia Hysong: Oh, sorry about that.

Molly: No problem at all, as long as we got it across. Ok, it looks like we've got about an 80% response rate. So that looks great, and I'll go ahead and close the poll out and share those results. So 6% of the respondents say they don't know what the term means, 7% are clinicians who receive clinical audit and feedback, 19% are clinicians or administrators that provide clinical audit and feedback, 35% are researchers who study audit and feedback, and 69% are interested in designing audit and feedback tools or interventions. So that's great! And I'll turn it back to you now. There we go.

Dr. Sylvia Hysong: Alright! Wonderful! So it sounds like we have a nice variety of folks on the call today. So that's, so hopefully by the end of the hour there will be a little bit of everything, that I will have said a little bit for all of those types of audiences and you will have gotten a little bit out of today's hour. Just to give you a brief overview of what we'll be discussing today, we'll start with a little bit of background and theory of what audit and feedback is all about since I heard we had some folks who need a little bit of a briefing on that. We'll walk you through some research findings from, you know, from our laboratory and then just wrap up with a couple of cases that have actually used evidence-based design of audit and feedback to design their feedback interventions. And so hopefully by the end of today I hope to leave you with the thought that when designed correctly, audit and feedback can indeed be an effective and cost effective intervention for improving quality of care.

So let's start with just a straight definition. So it's an intervention that involves measuring an individual for a professional practice and performance, comparing that performance level to professional standards or targets, and delivering the results of that comparison to the individual or team in question. So it's actually one of the most commonly used interventions for improving quality of care. And we'll see this in the aggregate of all the authors of the Cochrane Review on the subject. And so we'll be looking at that a little bit more closely a little bit later in the hour. And there's good reason for, you know, we should, why we should consider having audit and feedback as part of our quality improvement arsenal.

First of all, it's a practical and a reasonably inexpensive intervention as compared to say, something like pay-for-performance. It's also used often times as an intermediate step or in conjunction with other quality improvement interventions like pay-for-performance or continuing education in one of the cases that we'll see later on that does exactly that. And again, by itself, but even by itself it can be effective if executed correctly, and those are three very key words that we'll talk about today. But here's the rub. If you do it wrong, it's not just a negative, it's not just a matter of oh, the feedback didn't work. It can actually be detrimental if you do feedback incorrectly instead of correctly. So that's another take-away that I hope that you leave with today.

You know, audit and feedback is certainly not unique to health care. It's used in many industries, but here in health care, we traditionally see it in the form of clinical performance assessment. That usually means abstracting the political, the medical record to calculate and compile some kind of performance measure like percentages. Patients who are, who have hypertension and have, and are above a certain level of blood pressure control, for example, indeed often times the measures tend to be specific to individual disease conditions. And as I just said, they tend to be expressed as a percentage of eligible patients who received the desired care or exhibit the desired clinical outcome. And those of you who are familiar with SAIL or perhaps maybe the earlier EPRP reports might, you know, are probable scenario with what that might look like.

In the best case scenario this information is actually given to each individual clinician, but as we'll see from the research, that is not always the case. So you can either consider this an opinion or you can consider it a pop quiz. It's up to you. So I'd like to just get a sense of the audience, of what the audience thinks. Do you think audit and feedback, in your experience, is it effective, and we can go from of course it is or to absolutely not, or you know, yes but with some caveats.

Molly: Thank you! So for audience, this one you will just select one option naturally. And looks like responses are coming in. This is an anonymous poll question, so feel free to respond honestly. No feelings will be hurt.

Dr. Sylvia Hysong: Yes! Absolutely!

Molly: Alright, looks like we're right around 80% again. So 3% say of course it is, 69% say sometimes but it depends on a large number of things, 28% only if the underlying data are good, and 0% said absolutely not. So that's good!

Dr. Sylvia Hysong: Wonderful! Wonderful! So there is definite, there's a variety of responses, but at least I hear that nobody believes that it is completely useless, and that's excellent news! And so, well, so let's answer the question. Is it effective? And so according to the Cochrane Review on the subject, those who said yes but it depends are probably on the right track. What they found is that feedback was highly variable and is varied from either substantially positive to actually negative and actually having a decrease in performance, and with the median adjusted risk difference of just over 4%. And again, they found a couple of things that moderated that effect. In other words, they found several factors that changed the effectiveness of the feedback intervention. They saw that it, you know, depended on baseline performance, and again, how feedback was provided, and we'll see that in more detail shortly.

The reason behind a lot of this variability according to the literature and according to several researchers is because audit and feedback has been researched without the aid of theory to guide its design. And I saw a little bit of that when I was doing meta-analysis, and one of my pet peeves and one of my frustrations was that so many of the studies that I looked at provide so little information about the details of the actual intervention that it was sort of this black box phenomenon, and so hopefully we're, we'll help open that black box today.

So fortunately there is, indeed, a theory about feedback intervention effectiveness. There's a theory that can help, and ironically this theory, it's just called feedback intervention theory, doesn't see, doesn't think it gets used very much at all in health care. There's an article that, where they evaluated 20 different studies of audit and feedback, and these were 20 studies that actually used some manner of theory, and none of the theories involved were directly related to feedback, and the one theory that is related to feedback directly was never involved.

So feedback intervention theory, let's just give you, let me just walk you very quickly through some of those basic tenets. It goes, it really sort of is founded on behavior regulation. And basically, according to FIT, feedback intervention theory, they say behavior is regulated by comparing feedback to existing standards. So you receive some feedback and then you compare it to, you know, existing highly organized goals or standards, and then feedback intervention works by providing new information to you that redirects your attention. And anything that redirects your attention toward the details of the task will make the feedback intervention more effective. Anything that redirected attention away from the details of the task, either like, to yourself or to just some general task orientation, is going to be made, is going to make feedback less effective. And so whether anything constitutes the secret sauce there is right here in the box, it's all the feedback intervention keys. In other words, all the characteristics of the content and the format and the delivery of that feedback that are really, quite frankly, the things that we have most control over that can most impact feedback effectiveness.

And so recall I mentioned that there had been a Cochrane Review of audit and feedback done. Outside of health care there's also been a very large meta-analysis which is actually the same paper as where feedback intervention theory is proposed. So they started, so that, the inspiration for that theory in the first place was this meta-analysis of studies that, where they, and it was done in managerial literature that found that 40% of the studies in the meta-analysis on feedback to be detrimental to performance; 40%. That is not chump change. But they also found, you know, again, this was the inspiration for the theory that there are a variety of characteristics that you could play with that would actually, that explained a lot of the variance that they were seeing in the studies. And so they proposed a host of content and format characteristics to be looked at that could help feedback effectiveness.

Now, you know, one of the issues of the, was the study, for us anyway, is that there were no medical studies in this meta-analysis. It was all managerial, management studies. One of my older papers, one of my other, in some of my other work I conducted a qualitative study in VA facilities and found, you know, some of the same things that we were seeing in the Kluger and DeNisi meta-analysis, that facilities that provided timely feedback, individualized feedback, nonpunitive feedback tended to adapt better to guideline and implementation. So we were seeing, so again, we were seeing very similar findings, but again, this was not a study about feedback. This was intended to be originally a study about guideline implementation. We just observed this phenomenon in a study that was not designed to measure feedback.

So what was the next logical step at this point? What we decided to do, what I call the Reese's Peanut Butter Cup Study. We put Kluger and DeNisi's proverbial peanut butter into the Cochrane Review proverbial chocolates, if you will. We took many of the moderators that we saw in the Kluger and DeNisi meta-analysis, and we analyzed the studies from the Cochrane Review using the feedback intervention theory framework, and this is what we found.

So we ended up, after applying all the criteria, we ended, and we ended up with 19 studies that we could use. We called it, I mentioned earlier that one of my frustrations was that there were a lot of studies that didn't, just didn't report enough detail for us to do any kind of a quantitative analysis. And so, again, the Cochrane Review started with over 100 studies; only 19 of them were usable for meta-analytic purposes like this one. We found it specifically significant size of five, almost half a standard deviation of .4, in favor of performance, and you can see here from the graph that, indeed, more studies than not found that audit and feedback was effective. But there was still a lot of variability here to be explained, and in fact, there are still a few studies that showed negative results. One of them actually even significant negative results.

So we did our moderator analyses. We looked at some of the factors that could explain this variability, and we found several moderators that were consistent with the original meta-analysis. We saw, again, we found that studies that provided correct solution information, which is basically suggestions or information about how to do the task correctly, studies that delivered feedback in writing and not just verbally or graphically. And finally, studies that delivered feedback more frequently tended to have the best results, had the most effective, best results with their feedback intervention.

So that was, I apologize. So that was a really, sort of an important next step because now we had meta-analytic evidence in the health care literature about, that feedback could indeed be an effective, and things that we could do to make sure that it was done correctly.

So the next step we took was to look at how feedback was being done in primary care settings in the VA. So we call the, you know, we had a previous study that looked at, a qualitative study that found some interesting things about feedback that they, that it wasn't just designed to be a feedback study. So we decided to go back and actually design a feedback study, something to look, and qualitative study to look specifically at feedback. We were interested in finding out whether high performing versus low performing facilities as well as facilities with either consistently moderate or highly variable performance, because again, there's more than one way to get to average, whether these different types of facilities had different mental models about how they used and applied clinical performance feedback and whether or not they had different, differing strategies for delivering feedback to clinicians.

So we sought out 16 facilities, four of each kind, and at each facility we tried to interview one nurse and one physician as our clinician key informants. We also interviewed the primary care chief and either the facility director or the chief of staff at each facility to really try to get a more complete picture of what the facility gestalt looked like. We did hour long interview or however long they wanted to talk to us. We weren't picky. And we followed an iterative process of transcription and coding and analysis and interview so that we could really sort of, could adapt flexibly as we were going along to what the data were telling us.

Just to give you a little sense of what the sites looked like, so within each category of performance, whether you are high or low or just the different types of moderate, you can see that there's definitely, that there's variability in these organizational characteristics in facility five in the strength of the academic mission and their primary care presence and in the number of primary care personnel. And it was interesting. We sort of got lucky on that because we really originally selected purely on performance in terms of the top performers, the bottom performers or some of the bottom performers, and then we started looking at this and were able to do a little bit more.

And so after doing all of that, what did we find? We found a [inaudible 19:09] challenge. That is the first thing we found. We selected these sites in 2009 based on 2008 performance data, and we can see here, and if you look at the top half of the graph, we've got, you know, and they fall, you know, we designed it this way so they fall very nicely and very neatly, and so that was the categories that we put together. We have the high performers at the top. We have the low performers at the bottom. We've got, you know, consistently moderate performers right in the middle with low variability, and you've got your highly variable performers also in the middle with high variability across their performance metrics. But we did not interview these lovely sites in 2009. We interviewed them in 2011, 2012 just by, you know, by the logistics of the timeline of how we conducted the study.

So when we decided to look at their performance rankings in 2012, which was much closer to when we actually interviewed them, you can see in the bottom half of the graph that their standings looked nothing like what they looked like in 2008. So really we had a conundrum. We couldn't answer the original questions that we wanted to answer, those questions about either differences in facilities of varying levels of performance. And so, and because, again, even if we decided to take, well, say these are the top performers, these are the bottom performers, you don't have these nice, you know, discreet buckets. You do have much more of a continuum. That's ok. That doesn't mean we don't, we never waste at the VA. That doesn't mean that there were not anything, that there were not interesting findings to be had. So let's take a look at some of the things that we did find.

We started very simply and descriptively by cataloguing the types of strategies that facilities used to provide feedback, and we saw a lot of variability across the sites. We, in fact, we have 165 unique strategies for feeding back clinical performance information. Thankfully, these things really sort of, you know, at the end of the day we, 155 unique really boils down to four classes or general categories of strategies. And, you know, #1 is computer interfaces, which, you know, again sort of, which basically you can think of that dashboards or some of the computerized reports that we get, for example, from the PACT almanac or things like that. We have conversations of different kinds but informal conversations. Meetings of all manner and variety, as you can see from the third bar, just sort of, that was a very common strategy is to have meetings of some kind or another. And then finally reports, written reports of some type or another. Sometimes some of them were locally generated. Some of them were more nationally generated.

One of the things we found was, again, so that there was really no meaningful relationship between sort of, between who used these, so far as we didn't find, for example, that the high performers tended to use more computerized interfaces than low performers whether they were a low performer in 2011 or 2012. So we didn't really see much of that at all. In fact, there were four sites in particular that remained in their original performance category. So if they were low in 2008, they were low in 2012, and so forth. And again, we saw more similarities than differences amongst them in terms of strategy classes, so again they, even regardless of what bucket they were in they were tending to use the same kind of types of strategies. So again, we were not able to see any kind of relationship between performance and the specific types of strategies.

Now what we are, the, I'm sorry, let me go back one slide again. The other interesting thing that we did, however, was after we categorized, after we figured out are you, what bucket are you in. Are you a computer interface or a conversation or a meeting, we coded each of those 155 unique strategies by, we categorized them by the types of feedback used that they exhibited, that as reported by Kluger and DeNisi and the Cochrane meta-analysis. So in other words, we coded them along each of their characteristics that strategy exhibited. And what you see, and so you can actually code, you know, all the characteristics that, according to the literature, we know that they have a positive impact on feedback effectiveness and then code them along the number of characteristics that the strategy exhibits that are known to have a negative impact on feedback effectiveness. And so if you add up all the positives and subtract out all the negatives, you get what we called a richness score. If anybody has a better name for that, I am certainly all ears. We weren't particularly happy with that name, but that's the name that we have today.

And as you can, the interesting finding that you see from that analysis and from that set of validation is that about two-thirds of the strategies that the VA was using, at least at these 16 sites, was considered ineffective by the evidence base or at least more ineffective than effective. It's not that it was completely useless, that the, but the balance of effective characteristics did not measure up to balance and effective characteristics.

So let's take a look at which ones were the worst offenders and which ones were the stars. And so in terms, on the positive side, and again, remember that these were, that the study was essentially centered around EPRP, the use of EPRP as a source of feedback. So individualized EPRP reports, and individualized is the operative word. They were tailored to the physician or at least to the team and provided more personalized information. You know, the, again, sort of the clinical reminder reports again were, one of the things that was important was it provided a little bit of correct solution information; it was also individualized. Even the primary care council meeting was a dedicated meeting to talk about performance. So again, something that wasn't simply just part of what was done normally.

In the, on the interceptive side, what we see is a very clear pattern here. Meetings, meetings, and more meetings. And so the meetings, you know, just were, tended to rely mostly on verbal and not a lot of written information, though tended to have, they attempted to be more track, or more information about sort of more punitive types of intervention. So again, you know, so the sort of clear distinction was more of factual written kinds of strategies for, on the positive side versus sort of verbal group based rather than individualized public, and very public sort of meetings about performance which are associated with less, with lower feedback effectiveness.

We also looked at the mental models. Recall that we also wanted to know a little bit more about the mental models of these facilities, about feedback in general. And those of you who have been around know the phrase when you have seen one VA, you have seen one VA, and that is exactly what we found here. We found a lot of variability from facility to facility in terms of their mental models. I mean they were so hard to categorize, but you can at least categorize whether these are either positive or negative.

On the positive side, we saw that facilities that really thought of feedback positively saw feedback as a means to an end, whether that end was benchmarking, just benchmarking themselves against a standard, or whether it was using feedback to help with a strategic alignments of the facility for its mission and its goals. Feedback was seen in that way. And maybe if we have a little bit of time at the end we will, you know, maybe we can see a couple of those quotes from the study, but I want to be mindful and really leave time for a good discussion and question, but also whether it was also as a way to improve the transparency so that, so again, these were some positive views and mental models about feedback.

On the negative side, this was by far the most commonly cited mental model was that the clinical performance data that they were receiving from EPRP was not a good representation of quality. Whether it's because of sampling issues, whether it's because they felt the data wasn't clean, there was definitely a source credibility issue with, at B site about their ability to use EPRP data as a source of feedback.

The other interesting one was this issue that sort of, the clinical performance data has made it hyper-vigilant. So it's not necessarily so much about the specific content and the specific values of the feedback that they were getting, but the fact that they are getting constantly bombarded with this, you know, they feel the, that the sites saw that they are essentially walking on eggshells, if you will. There was one site that until the switch to PACT hadn't even gotten any feedback, which I thought was interesting.

And then there was this, sort of this mixed mental model at one site where, you know, they sort of agreed with this contention that it wasn't really a good representation of quality but that it was sufficiently useful to ask the question, you know, if it's not, if we can show that it's not the data that is problematic, whether we can get over the first credibility problem and we can prove that the data are not the problem, then the only thing that's standing is me and my team and then we need to look at that a little bit more closely. So I thought that that view of feedback was actually a pretty interesting one at that one site.

We eventually had the opportunity with this study to focus on a couple of specific areas. One was clinician acceptance of feedback, and #2 was feedback delivered to teams. We were actually, so this study was conducted right as VA was shifting from this additional model of patient care and primary care to Patient Aligned Care Teams, or PACT. And so we had an opportunity to ask a couple of questions about that transition and about their tasks, which we'll see in a moment. But first we had the opportunity of looking at physician acceptance, which basically means, you know, the extent to which a physician, you know, feedback would be in whether it's a physician, in this case physician, you know, how well they received, how positively or fairly they receive, they accept the feedback that they receive. And we know from other research and I/O psychology that that clearly can have an impact on the effectiveness of the feedback regardless of the feedback diagnosis. You can kill yourself until you're blue in the face trying to design the perfect feedback intervention, and if the recipient of that feedback has a source credibility problem, does not fundamentally accept the feedback that you are giving him or her, your feedback intervention or your feedback effectiveness is going to go down, and there's not, very little you can do until you address the credibility issue or the acceptance issue.

There's not a lot of, and so there's not a lot of work on this topic in the health care setting. It's, a lot of it, most of it is in the management literature and the I/O psychology literature. So we took this opportunity to actually, since we have some rich qualitative data, to do a special analysis to look at what aspect of the audit and feedback process seemed to impact physicians' acceptance of feedback and what actions physicians took when receiving performance feedback and if receiving that feedback actually resulted in them taking, you know, altering their behavior in any way.

So no, there will not be a quiz at the end. This is a pretty busy chart, but this is, this just got published late last year, so it is available for better, to look at a little bit more closely. But what you're seeing here is the work of a really very smart, very detail oriented fellow. I mean Donna Payne [phonetic], who was on our team, she went back through the interviews and came up with this model. So what you see here, essentially she, so we can start here, but I think by looking at the center row, and basically she looked at, ok, when somebody receives feedback what's the reaction. It can be either acceptance or nonacceptance. You can, then what is the action taken by that feedback recipient, and they can either take an action or not, and what impact does that action or lack thereof have, whether they, it results in actually modifying behavior or not. And so we see that there's quite a bit of, and so what you see on the top half is things that lead to a positive response and to positive behavior modification. What you see below are things that lead to a negative response.

But I think one of the unique and interesting components of this model that she was able to come up with from the data is actually this piece, is the emotion piece. Most work in feedback and in performance measurement and in performance improvement and quality improvement is so cognitively based and it assumes that everybody is rational in reaction and that people's reactions are entirely cognitively and rationally based. And what we find here in this model is actually that emotion had a really big role in physicians' reaction, so that when feedback was received it spiked an emotional reaction of one manner or another in that recipient, and that it was, and that based on that emotional reaction, the rest of the model followed. And so obviously if you, and so, if it sparked an emotion of apathy or irritation or resentment, you were certainly more likely to take no action and express apathy for example versus on the positive side if you were content with the feedback that you received and it sort of confirmed what you already know, or interestingly if you were embarrassed, in other words if you were kind shamed into improving your performance, you saw sort of, again, different sets of actions that resulted in behavior modification.

So that was one set of analyses that we did. And then this is, I mean this is fairly new findings. I think this is one area that we can really think about how we might capitalize on this idea to design feedback a little more effectively.

The other area that we discussed was whether the question of audit and feedback in teams. And we know that, and so we know that from outside of health care that feedback to teams needs to be handled a little bit differently than feedback to individuals in order for it to be effective. You need to provide both group and individual information about performance, for example. And that needs, and that feedback needs to be of equal quality throughout the group level and at the individual level or else people are going to gravitate to whichever feedback is at the highest quality and perform accordingly.

So again, so we did a special analysis, again, of asking the question what were some of the changes to the feedback strategies and mental models as a result of this shift to Patient Aligned Care Teams. And we essentially found generally sort of four themes in this qualitative, and the first thing we found was that ownership of clinical performance still rests largely with the physician, you know, even to this day. It's changing, but it's still the case that most of feedback really goes to the physician. There was one site who said that, for example, that the nurses didn't even have access to things like the primary care almanac or to some of the tools that they actually sort of needed to be able to do their job and keep up with the quality measures.

Another theme that we saw was that the newest feedback tool, which again, which at the time was the primary care almanac, was not optimally designed for teams. Again, you could go down to the facility level, you could scroll down to the individual provider level, but in terms of actually providing feedback about the specific aspects of that measure that are handled by another member of the team, it provided no information about that.

We also found that, and yet, you know, we found that clinical performance, that those tools tended to be most effective and most useful when they were managed by somebody other than the physician. When they have, for example, either a care manager or somebody, or perhaps, and it didn't have to be through a particular path, maybe a dedicated person whose job was to constantly be scrubbing the list, for example. And fundamentally sort of that clinical performance assessment at the time really hadn't changed since the transition to team-based care. So there was this massive nationwide, national scale implementation of primary care teams, but the tools, but the performance assessment and the feedback tools had not really kept pace with that transition.

So sort of after all that doom and gloom that we just found in that study, what's to be done? What can we do to make feedback better in healthcare? And so for this last, for the last few minutes together before we go to questions, what I'd like to show you is two studies that actually did do evidence-based and theory-based design of their audit and feedback interventions in their respective studies.

The first one was a study conducted by our illustrious center director, Dr. Laura Petersen, and one of the, and so the objective of this study, of her study was actually, so this one was interesting because in this case audit and feedback was the control intervention. It was not the intervention of interest. In this case, in this study the intervention of interest was pay-for-performance. Recall that at the beginning I said that these can often times come as a co-intervention. So what they were wanting to find out was whether pay-for-performance can help physicians meet guideline recommended goals for controlling patient's hypertension, look at JNC 7 guidelines. And so what they were trying to do was change, was get more physicians and more clinicians to prescribe thiazide diuretics, which are the intended, at least at the time the first line of defense medication-wise, I would say after lifestyle modification, for controlling hypertension.

So they looked at, so they provided audit and feedback to everybody in the study, and then for those in the intervention group they provided pay-for-performance either for individual, at the individual level to individual physicians on the board or to the, or at the group level only, so to the entire clinic, or a combination of both individual and group level pay-for-performance. But everybody, including the control, got audit and feedback about how well they were doing on hypertension.

And this is an example, a little bit of an example of some of the main elements of what the report, of what the feedback report that everybody got contained. And again, it didn't look exactly like this because it was part of an interactive website, but the content itself is accurate. And so let's look at some of the content elements or some of the feedback elements that were used for this intervention, and one of them is, again, both graphical unwritten feedback format. We have goal setting, so we gave them, so we can see here at this line, on this line that we gave them goals for the next period and they had goals here in this written feedback report as well. And we also provided normative information, and that was kind of interesting because literature is sort of mixed on this issue of normative information, but we, in speaking with the sites and such, they felt pretty strongly that they wanted to see how they were doing compared to others, to other sites and to the study average.

It was interesting because we almost did the study and we almost did our job a little too well because for a while we were seeing between peers one and two, between baseline and the first period, we actually saw an improvement in all four groups, not just the intervention groups. And then eventually we saw then a significant difference between, you know, feedback and pay-for-performance. But one of the things that we thought was interesting was that physicians reported that the feedback delivered by the intervention was more useful and meaningful than what they regularly received from the facility. And again the prescription that, we actually did see significant improvement again for both control and intervention, but then finally that the intervention group kicked in and saw significant improvement over just audit and feedback alone.

The second example is from a study by Dr. Barbara Trautner, and the behavior we wanted to change in this particular study was the inappropriate diagnosis of treatment of asymptomatic bacteriuria and catheter-associated urinary tract infection. So this was called the kicking CAUTI campaign. So basically a lot of the study was inspired by this issue that a lot of physicians were having problems because they were treating patients with antibiotics, patients that they thought had CAUTI but really what they had was asymptomatic bacteriuria. And so in this case what we did, so they looked at 154 internal medicine residents at two VA Medical Centers, so this also was a controlled trial, and what they wanted to change was these inappropriate diagnosis and inappropriate treatment of ABU as CAUTI.

And so in this case this was much more intensive and much more personalized and individualized. The intervention really, in this case, audit and feedback was the intervention of interest. And so we had trained experts, or I'm sorry, trained research assistants that contacted the residents to deliver case-specific feedback face to face. We actually walked them through one, you know, several of their own cases and walked them through how they did, so their decision making relative to what the guidelines recommend. And so we did a flow chart, we prepared a flow chart, basically as an explanatory device, and so again, this is a little bit different from what the participants actually saw because, again, they had an interact with PowerPoints and walked them through the entire algorithm.

So looking at some of the elements that we incorporated here, we have both written information and a graphical format, so we had it, we give them the one-two punch. We also provided, and so very importantly, we provided correct solution information. Here we actually walked them through each step of the algorithm and showed them this is what the algorithm said you needed to do, and this is what you did. This is the decision that you made. And so you, so the recipient could clearly, very clearly see what the correct path should have been and what their path was, and provided individualized feedback at each step. The content was standardized. It was PACT based. So none of those oh, what in the world were you thinking, right? It was very focused on the details of the decision making and diagnostic process.

And the results in this study was that we saw a 40% reduction in unnecessary screening for ABU compared to control. And again, and the specificity in diagnosing asymptomatic bacteriuria, ABU, improved from .63 to .79 compared to very little improvement at the control site. So, you know, obviously this was an intensive form of feedback intervention but with really, really good results.

So, you know, to kind of wrap up what we've learned so far today, so to just give you, because I've been talking a lot. So let's do a little bit of a summary.

We know that historically audit and feedback has been studied atheoretically largely in healthcare research. We know that there's theory and empirical evidence that tell us that the design elements of a feedback intervention matter. How you design your feedback intervention matters. And we've seen that at least currently it's not being implemented in an evidence, as evidence-based of a way it could be. And again, when executed properly, audit and feedback can really, can be highly effective at improving quality of care.

Obviously, you know, this is still an ongoing area of research, so the next steps for us is we're looking more closely at feedback at the team level. We're looking a little bit more about, you know, at source credibility and trying to prioritize it according to value. And so we are, and we've got another study in that's looking at team configurations and pattern feedback then for teams. So stay tuned to see if, as we continue our journey down this area of audit and feedback.

I do a lot of study and have got a lot of information actually, and so here's just a list of some additional reading and some references if you're interested in more detail in any of the words that I spoke about today.

And last but not least, I just want to thank you all for being such an attentive audience and for listening this morning or this afternoon if you're on the East coast, and certainly happy to answer questions at this time, and if we need to and certainly post webinar. Here's my contact information and I'm happy to follow up with you afterwards.

Molly: Excellent! Well, thank you very much! We do have lots of great pending questions, and we'll get right to them. For those of you that joined us after the top of the hour to submit a question or a comment please use the question section of the GoToWebinar control panel. That'll expand the dialogue box and you can then submit your question or comment there, and we'll get to it in the order it is received. The first one, does provider-to-provider mentoring mean doctor to doctor? Can you talk more about whether the mentoring was formalized?

Dr. Sylvia Hysong: In terms of feedback? So I believe, this is certainly the, generally provider to provider is certainly in the VA and primary care. A provider can mean either physician or it can mean a physician's assistant or it can mean as a nurse practitioner. So we use that term broadly. So we did, certainly in the study that we did we did not discriminate whether it was an MD or a PA or an NP because there, again, it's the sort of the person that was clinically responsible for, whoever was clinically responsible for a given panel is how we conceptualized that. But I think, if what I, I read a little bit into that question a little bit, it sounds, it certainly brings up interesting issues of interprofessionalism so that if you're having, you know, so that if you've got informal conversations between two physicians it might look a little bit different than informal conversation or informal feedback between, you know, perhaps a physician and a PA or a physician and an NP or any one of those combinations. We have not looked into that in particular, but that certainly is an interesting dynamic to explore.

Molly: Thank you! The next question we have, have you considered using the theoretical domain's framework which includes emotion as well as 13 other domains for looking at behavior change related to feedback?

Dr. Sylvia Hysong: We have looked at it briefly. It's certainly a very broad and all encompassing sort of framework, so it's one of those that you sort of have to, you know, sort of decide, it's not [inaudible 53:32] where you sort of have to decide sort of what part of the puzzle you want to play with. Certainly at the time that we did a lot of this work I don't think that was widely known or was widely, you know, as widely publicized. And so we, so at the time sort of the feedback intervention theory was sort of the framework that seemed to best fit the kinds of questions that we really wanted to look at, and you know, again, sort of even just starting with the question of what are some of, you know, what's inside that black box, you know, what are some of the ways that different feedback interventions are being designed and delivered but certainly the theoretical domain's framework is another, is certainly a viable alternative.

Molly: Thank you! Let's see. So when you were on the CAUTI slide...

Dr. Sylvia Hysong: On the what slide?

Molly: The results from study 2, C-A-U-T-I.

Dr. Sylvia Hysong: Oh, CAUTI, yeah.

Molly: CAUTI, when you were on the CAUTI slide, somebody writes in that they'd love to get that data, solutions, references, etc., if that's available.

Dr. Sylvia Hysong: Oh, sure! That study, it's published and it's on the reference list, but yes, I'm happy to share those results. I don't know if we can, if, I don't know if that was part of the, you know, the archives, the webinar, whether it's possible to post any sort of additional material, but I'm happy to, you know, share those papers that came from those two studies because they have been published.

Molly: Yeah, definitely. We have a couple options. You can either provide me the links and I'll include them in the followup email, or if you want to provide the actual papers I can tack them onto the end of the slides and get them on the archive page. Your call. We can touch base offline.

Dr. Sylvia Hysong: Ok. That would be great.

Molly: Can you comment on the expense of doing chart review to do feedback interventions?

Dr. Sylvia Hysong: Oh, that's so funny you should say that because I'm, because, yeah, it's certainly not cheap. So in both of these cases, both of these studies did do manual chart review. And in fact, particularly in the pay-for-performance study they, because of the specifics of what they were trying to change, a lot of that information, you know, so nowadays there's a lot more information that can be extracted a little bit more automatedly and to the extent that the behavior that you're trying to change lends itself to that, then I would certainly recommend going, you know, spending your dollars on a programmer that can do sequel correlating or something like that. But essentially what is, particularly in both of these cases, especially in the P-for-P study I know that they were only able to extract 40 charts per provider per site. So in other words for each participant, for each time period and each participant, they were only able to, they abstracted 40 charts. That was the sample size per person per time point. And part of it is because, you know, it took about a good, you know, 30 minutes to abstract a single chart because of the complexity of what they were trying to do. So definitely the, you know, what you choose to provide feedback about, the cost will definitely be driven by sort of your ability to do that in a more automated way or in a more manual way, and actually you could do a hybrid. I mean you don't have to do it all. They're not mutually exclusive, right? You can start with, you know, getting as much as you possibly can done in an automated fashion and then reserving your chart reviewers for the things that really only require eyeballs.

Molly: Thank you! The next question we have, let's see. Has anyone looked at the differential impact of using audit and feedback with education, for instance, or I'm sorry, i.e., the correct solution versus education alone?

Dr. Sylvia Hysong: So meaning looking at, specifically looking at just providing general information versus providing correct solution after each time frame. I don't think I've seen that specific comparison. Usually in the way that, what the, the way that these characteristics have been mostly studied have been meta-analytically, so by looking at the characteristics of what the studies provided. But that sounds like a very interesting comparison because it certainly looks at, you know, whether you just have, right? Whether a general educational effect, you know, whether just providing general education versus providing specifics, you know, specific correct solution information after each time point. Now there is earlier work that certainly shows that just general education seems to just be kind of unnecessary but not sufficient intervention for behavior change. So that it's sort of puts everybody on the same playing field, but you might get a spike at the beginning but it's sort, but a very quick decay over time and so you don't really have much of a permanent, over time in behavior change by education alone.

Molly: Thank you! I know we're at the top of the hour but I do still have some pending questions. Are you able to stay on so that we can capture them in the recording?

Dr. Sylvia Hysong: Yeah, absolutely!

Molly: Ok, excellent! Thank you! If anybody does have to drop off due to time constraints, please when you exit the session fill out the feedback survey. It'll populate on your screen after a second or two, and we do look closely at your responses. It's just a few questions, but it does help us. So thank you in advance. Alright.

Dr. Sylvia Hysong: Thanks to all those that I see dropping off. Thanks for attending. Really appreciate it.

Molly: Any data to differentiate physician reporting versus the feedback itself?

Dr. Sylvia Hysong: Physician reporting versus the feedback itself. I'm not sure I understand what the question is getting at. Maybe if the asker can maybe clarify through the chat box?

Molly: Yeah. Yeah, they can write in and clarify. We'll move on to the next question while we wait.

Dr. Sylvia Hysong: Ok.

Molly: I suspect that the effectiveness of the audit and feedback intervention depends partially on the site. How can we assess the site's "readiness" to receive feedback? Are there any formal tools for this?

Dr. Sylvia Hysong: Oh, what a wonderful question! So yeah, there's definitely, so you've hit on a very important concept which was sort of the idea of having a culture of feedback at the facility. And I think that's a little bit about, you know, that's a little bit of what we were trying to get at with the question of, you know, what's the mental model at this facility, you know, because the mental model is kind of, would have been indicative of sort of whether there was a larger culture of feedback. We just sort of didn't, you know, sort of connect all the dots at the time. But certainly the, I haven't seen much data inside of healthcare. I know that there's a lot, that there's definitely literature in I/O psychology, which is my discipline of origin, that looks at whether there is a culture of feedback so there, so I mean there's certain, there's a lot of possible elements that can go into that.

There's the question of psychological safety. Do you feel safe to actually receive feedback? Or do you feel like every time you're going into your boss's office to "get feedback" you feel like you're being sent to the principal's office? Or so, you know, so there's the question of psychological safety. There's a question of is there a culture where it's not only safe to receive feedback but maybe whether people are actively seeking feedback.

So there's definitely, you know, so there's some work to be done on that, but there's definitely, we're suggesting that if your work environment is one that has a culture of psychological safety and a culture on feedback in a very, very much in the same way that of thinking about a culture of patient safety, right? Those two, in many respects, are kind of analysis. It's the idea that it's, that you will not be, you know, reported to the board if you make a mistake or, you know, so in the same way having sort of a culture where it's ok to get bad news, if that, you know, when you are being told that your numbers are a little low, the reaction is not you're a horrible person but that the reaction is hey, let's look at what might be going on where we can help support you so that, you know, you can provide, you know, so that we can all provide better care. I think that is definitely important, and I'm sorry I've rambled on a lot, but if there's, there's a lot to unpack in the question of culture and feedback, and so the attendee's question about whether feedback was varied by site has been very much, is very much on point.

Molly: Thank you! The next question, is there, have you looked at any variation in feedback effectiveness between feedback on underuse versus feedback on overuse?

Dr. Sylvia Hysong: Of utilization? No, not at all. I have not looked at that question at all, so that's my shortest answer today.

Molly: Ok. For those people that were looking for the paper, the published papers earlier, Anne Sales did write in the papers can be shared through IRG, VA Pulse website. So that is another...

Dr. Sylvia Hysong: Lovely!

Molly: Yeah.

Dr. Sylvia Hysong: Thank you, Anne!

Molly: Ok, so we have some clarification of the question I asked before. So the original question was any data to differentiate physician reporting versus the feedback itself, and then they specified many programs ask the docs to enter the data about their performance. That's an intervention itself.

Dr. Sylvia Hysong: Ah, yeah. I'm afraid I can't comment on that. I'm not familiar. So I wish I had better news after all the work that the attendee went to clarify. I apologize.

Molly: No problem. We just have two remaining questions. How could something like audit and feedback link in with and inform an intervention like academic detailing? Academic detailing seems to exemplify many of the effective approaches to audit and feedback that you identified.

Dr. Sylvia Hysong: Right. Right. Right. Yeah, that's a lovely question, and I think, and as I mentioned before that audit and feedback can be, you know, it is commonly used as a cointervention, right? In conjunction with something, you know, like pay-for-performance or for, or even as academic detailing. And I think that the attendee is very right in that they share a lot of the things that are, you know, that they share a lot of common elements in terms of tailoring, sort of, really in, sort of in both cases they, you can think of both academic detailing and even feedback as variance in the learning theory space, right? You are trying to change behavior by providing new information, and so again, you can, if you think about it in, from that lens, and we can use a lot of what we know about learning theory and in terms of being able to personalize and individualize information to the learner's needs or to the, you know, again, to the feedback recipient's level of analysis, I think that, you know, all the, I personally haven't seen them linked hand in hand. I can very easily see them go hand in hand, and I mean I could see, for example, you could start, for example, with an academic detailing. And actually we did that, I'm sorry, I take that back, we did that in the Petersen study.

So that study started with an academic detailing about the JNC 7 guidelines where we provided all this, all of the participants, including the control group, with academic detailing about JNC 7 guidelines when it was appropriate and when it was inappropriate to prescribe thiazide diuretics versus other types of medications, etc. And so that's, that often is a common use of academic detailing.

So in a research scenario, that common use can be basically to make sure everybody is on the same level, right? On the same page. To make sure that the effects that you are seeing from your feedback intervention or that any differences or lack thereof are not due to differences in knowledge at baseline. Right? So, you know, academic detailing can be used in that way in a research study. In practice, I think that, you know, as I said before, they can sort of be used in conjunction in a tailored individualized way to try to meet the learning, the knowledge-based needs, and the task-based focus of attention to the feedback recipient so that behavior, so that then behavior can more easily change.

Molly: Thank you! And our final question, have you looked at any variation in feedback effectiveness between, oh, we already did that one. Alright! Well...

Dr. Sylvia Hysong: Ok.

Molly: Do you have any concluding comments or anything to wrap up with, Dr. Hysong?

Dr. Sylvia Hysong: No, this is, thank you for all the wonderful questions. I think this is, you know, it was really a pleasure to be here and a pleasure to present the study's work and to answer some questions, and I'm happy to follow up with folks online and happy to collaborate. This is great!

Molly: Final. Thank you so very much for coming on and lending your expertise to the field, and thank you to our attendees for joining us and to Dr. Anne Sales and Christine Kowalski who organized the monthly QUERI implementation network series session which takes place on the first Tuesday of every month. So, I'm sorry, this would be Thursday, the first Thursday of every month. So please keep your eyes peeled. We will be sending out the email for March sessions soon, so you can register for it at that time. So thank you once again, everyone, and for those of you remaining, please do fill out the feedback survey as I close out the session now. Have a great day!

[ END OF SESSION ]