AHRQ National Webinar on Medication Without Harm – How Digital Healthcare Tools Can Support Providers and Improve Patient Safety

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Understanding CancelRX: Impact on Clinical Workflows, Medication Safety Risks, and Patient Outcomes

QUESTION: There was interesting variation in the rate of prescribing after receiving the CancelRx order among the 6 to 8 pharmacies. Did you identify any characteristic differences between those pharmacies which might have contributed to the variation?

ANSWER: The analysis where we looked before and after with both pharmacy and the pharmaceutical class was somewhat exploratory and hypothesis-generating. We did not drill down to examine those characteristic differences. We looked at a single characteristic, so there may be some relationship between the types of medications that are more frequently dispensed in the pharmacies as well.

QUESTION: Did your study include quantifying safety events as a result of dispensing discontinued medications prior to the CancelRx implementation?

ANSWER: We did not; we came close with dispensing, which was one step before. This ties into Doctor Adelman's work in identifying these types of events in some feasible way without medical record review. We did not examine the safety events mostly because it is hard to measure and we have things like event reports and whatnot, but we do not think these are effective strategies for measurements. That is one of the challenges of this and I think a great area to continue to work in.

QUESTION: Have you assessed CancelRx's impact on clinical workflows and how is that integrated?

ANSWER: That is partly what we did as part of our AHRQ-funded work. We interviewed different stakeholders and conducted observations with the pharmacists, prescribers, and the patients. There is also a question in the chat about what you do if the patient already has the med in hand and this is one of the concerns and an area where more work needs to be done in terms of making decisions about implementation and understanding 1. how the prescriber identifies the outcome of the transaction, for example, and then how that informs their next steps; and 2. how the pharmacists respond. Some systems, more or less work is automated in response to CancelRx, so there is a lot of variation out there. Understanding how to optimize those workflows requires additional study in different environments, but it is important. To touch on the issue of the patients, we did interviews with patients and if the patient already has the medication, communicating with a pharmacy is not sufficient. An additional gap we identified was describing disposal information to patients and what to do when they do have a medication in hand that they should no longer be taking.

QUESTION: Do you have any thoughts about potential research gaps that AHRQ or other researchers can focus on with artificial intelligence or where we are transitioning to this new territory within healthcare?

ANSWER: There is a lot of buzz around AI. I am not sure about the AI connection, but I do think about how other systems are in place and other areas internationally around medications and technology and doing cross-comparisons. I have seen some of that work, but it is really interesting to think about what different technologies are in place to support our care teams as one thought.

Camille Vaughan M.D., M.S. on behalf of PI Ann Vandenberg
Emory School of Medicine

Scaling E.Q.U.I.P.P.E.D. Clinical Decision Support

QUESTION: How receptive were clinicians in the emergency department (ED) to the individual prescribing feedback?

ANSWER: In general, we have found prescribers to take this feedback with an open mind. We generally have very little pushback and there are a couple of factors that help. One is that the feedback is being delivered by a colleague that they trust and know. They also know that person is practicing in the same setting they are, which helps with acceptance. We have not advocated public shaming or strategies - we do not put people's names up on a board as you enter the ED or something like that. When they do receive peer benchmarking at many of the sites, it is done anonymously. The clinicians are seeing how they are doing compared to their peers, but they do not know exactly who the others are. Those are things that help with uptake. It is not a punitive type of feedback; it is really done in the setting of “We all want to do the best we can by our patients” and we approach it as an opportunity for improvement. The openness of “I'm prescribing in the same place you are, so if others in the prescribing environment are able to make choices that are considered safer, what can we do together to kind of make that of easier in your workflow?” You get the occasional folks who give some pushback. We try to help champions with evidence-based information for the occasional pushback on things like “Why is this particular medication a real problem? I have been prescribing it for years.”

QUESTION: Was the team able to assess how frequently the order sets were used?

ANSWER: We commonly get that question , particularly from sites that are considering the program. Not every site has been able to gather that level of data, but several have. When we have been able to gather that data, one of the interesting things we find is that if you look at a quantitative assessment of clicks on the order set to actually order the drug or to input the prescription, it is a lot lower and less frequent than we would think, given the enthusiasm often for the order sets at the implementing sites. This is where a mixed methods evaluation has been helpful, because when we actually talk to prescribers at the sites and ask them about their knowledge, awareness of the order sets, and how they have used the order sets, we actually find that there are a substantial number of what we call consultant users. These users look at the order set and internalize what drugs are being recommended and frequency, and then they order those drugs through their own ordering process that has been ironed out for their own workflow. And so, if we only looked at those quantitative clicks on the order set, we would be missing a substantial amount of the use of those order sets by this group of consultant users. I do think the order sets are often a piece that the health systems/champions

are really interested in having tools at their fingertips. We might have decided they were not that important if we only looked at clicks on the order set, so I would encourage folks to use those kind of mixed message approaches.

QUESTION: Do you have any thoughts about potential research gaps that AHRQ or other researchers can focus on with artificial intelligence or where we are transitioning to this new territory within healthcare?

ANSWER: I am amazed at how I browse something on the internet, and it pops up in several social media feeds immediately. There is so much integration across other kinds of commercial settings. We are just on the cusp of what is possible in healthcare. One of the areas that we saw as an opportunity for the EQUIPPED project is about renal dosing of medications, particularly for older people. Declines in kidney function are very common and often a prescriber might get a pop-up alert that tells them the creatinine clearance. That requires them to not dismiss the alert. We avoid alerts in our programs and that was a lot of the feedback we received, "please don't give me another actionable alert." I would love to have a better integration where the prescriber is trying to order a medication, and the EHR is able to propose dosing based on that patient's creatinine clearance, for instance. Right now, if prescribers notice an alert, they will need to go back out, look up the creatinine clearance, and figure out what they need to adjust to. You may have seen that in our order set, we did try to do that with a couple of medications just to make it a quick order. Even still, the prescriber would need to know what the patient's creatinine clearance is. That is the simple thing that I would love to see, and we have talked to some of our really bright engineering students to try to produce a strategy. It is just not as easy as it seems, but I think we will get there.

Jason Adelman, M.D., M.S.
Columbia University

Develop and Validate Health IT Safety Measures to Capture Violations of the Five Rights of Medication Safety

QUESTION: When you placed your call to the prescriber to ask them about the type of drug error, what were common explanations from them whereby you did not count it as an error?

ANSWER: There are several categories in that in that area. Most were errors, but if new information happened to present itself right after the order was placed, or you placed an order and then find out the patient has low blood pressure, you cancel the order. Another example is, imagine if you ordered three units of insulin for a patient and canceled it and then ordered thirty units, which would be a very dramatic difference and very often that would be an error. However, if you ordered thirty units of insulin, canceled it, and then ordered thirty-one units, it is a very subtle difference. There is no standard that says thirty is right and thirty-one is wrong. It is more like the art of medicine than an error. And so, when providers describe situations that were so subtle, you could see that there is no subtlety in being on the wrong patient, but there is opportunity for subtlety in dosing.

QUESTION: Were all your retract and reorder (RAR) queries, follow up survey questions, and analytics done in a separate system or is some of it integrated within the EHR workflows?

ANSWER: The system that we use to make phone calls, we pull data out of the EHR and then have a C# program that runs and uses Qualtrics. It is pulling from a couple of different systems and putting them together to make our automatic phone call system and it does not live directly in the electronic health record.

QUESTION: How did you arrive at the 30-minute cutoff for the RAR measure?

ANSWER: The 30-minute cutoff was derived from some prior research from Ross Capel and others and by looking at the data through a histogram of when orders were canceled. Using a combination of those things, we came up with a 30-minute cutoff, although it may be that errors happen at 45 minutes or 2 hours. Sometimes, the further you go out the more errors you can capture, but the positive predictor value goes down. And so, there is a trade-off between the number of errors captured and how good the positive predictive value is, but you want a good positive value for an automated measure. At some point, if you have 15,000 errors, you might be able to get 17,000 if you change the time a little bit, but it is not very meaningful. Fifteen thousand is more than enough to do the studies that we want and so that is our approach.

QUESTION: What other types of measures could help to identify electronic ordering errors?

ANSWER: As I shared, over 3,060 orders were placed in my organization that were canceled within 30 minutes. We called providers for just those with just the root retraction and about eighty percent said they were errors. We worked out the measure for the wrong patient, which is a 1,000 of the 3,060 and dosing for 20,000. There are hundreds of thousands left. You can order a CT of the head with contrast, cancel it, and then order without contrast. Or you can order an ankle x-ray for the left ankle, cancel it, and then order the same for the right ankle. Pretty much any order that can be placed can be placed as an error. When we see it canceled, it is a good sign that it was an error and if we see what happens next we may be able to isolate it, figure out the measure, and then work on the problem to solve it and use the measure to evaluate the intervention.

QUESTION: Do you have any recommendations for institutions that are facing implementation challenges to taking and storing patient photographs in the EHR?

ANSWER: We are finishing our analysis on this work and will be publishing it soon. It seems quite clear that photos help prevent orders on the wrong patient, and I strongly endorse that practice. It helps in every clinical setting we look at, whether it is inpatient, outpatient, or the emergency department. We currently at New York Presbyterian have over 1.5 million photos in our system and when I started we had zero. How you can get photos into the EHR may be vendor-dependent, but we had a multi-pronged approach and worked with our registers to take them to entry points. We also used kiosks to register, and we facilitated photo capture there, even for those on Epic. Epic also has an app that patients can use, and they can take their own photos. So, we use the multi-pronged strategy, it is really just getting leadership buy-in, a real commitment, and putting some effort into it. Right now, about eighty percent of our patients in the hospital have a photo; it is definitely doable.

QUESTION: Do you have any thoughts about potential research gaps that AHRQ or other researchers can focus on with artificial intelligence or where we are transitioning to this new territory within healthcare?

ANSWER: Just in the last two years, David Bates published an article in the New England Journal of Medicine about the current state of safety in the hospitals and the Office of Inspector General put out a report around the same time. Both reports remarkably showed that about twenty-five percent of admitted patients have adverse events, with the general theme that since “To Err is Human,” we really have not made all that much improvement in patient safety over the last 25 years. It is a very exciting time for those of us who do research in patient safety because of AI. We all have our smartphones and smartphones are ninety percent made by computers and robotics and ten percent by humans slapping the pieces together at the end. But healthcare is still ninety-nine percent of humans and humans make errors. And so, with AI, finally we can have a computer tapping us humans on the shoulder and to say “wait, are you sure you want to order that now,” or “hey, have you forgotten the EKG?” I was very excited to see that in just the last few days, AHRQ had a funding announcement for AI and my vote is for more of that; it is my hope that we will finally break the back of this problem of patient safety.