Adrian Hernande...: 00:04 Hey, this is Adrian Hernandez and welcome to the NIH Collaboratory Grand Rounds Podcast. We're here to give you some extra time with our speaker and ask them the tough and interesting questions you want to hear most. If you haven't already, we hope you'll watch the full Grand Rounds webinar recording to learn more. All of our Grand Rounds content can be found at rethinkingclinicaltrials.org. Thanks for joining.

Adrian Hernande...: 00:29 Hi, this is Adrian Hernandez, host of NIH Collaboratory Grand Rounds, and today we're here with the Leora Horwitz who just did a Grand Rounds on creating a learning health system through randomization. Leora, thanks for joining us.

Leora Horowitz: 00:44 It's my pleasure.

Adrian Hernande...: 00:46 So it sounds like you've done something really remarkable in a very complex system, which is actually inserting randomization into the healthcare delivery system to see what are the best strategies of care. Can you describe a little more what you all have been doing?

Leora Horowitz: 01:06 Sure. Well, it started probably two years ago now. We obtained some funding from one of the trustees of the hospital to start a program where we test what we're doing every day. We do a lot of things because they seem like good ideas. They're things to try to get best practices adopted and used by patients, and we just do them. We have very little way of knowing, usually, if what we're doing is effective. And so we began by randomizing either doing them at all versus not doing them for some patients where we're randomizing different sorts, different iterations, different strategies of the intervention.

Leora Horowitz: 01:57 We do these in pretty rapid succession. We run them for a few weeks or a couple months and see how they're going and then we can iterate if they're not going well. This is very similar to what industry does. They call it AB testing in the web design world where they'll test one headline versus another or one color on a web page versus another, so they're often small changes, but we are able that way to rigorously know whether what we're doing is effective and if not, we can make it better.

Adrian Hernande...: 02:27 Now New York is not necessarily known as the simplest place for healthcare. How did this fit in with the clinician community? How did it work?

Leora Horowitz: 02:42 It happens that I work at an institution that is very heavily data-driven. It's one thing that distinguishes NYU Langone from many

other health systems. So there's already a sort of ethos of pulling data and showing whether what we're doing is as effective. There's dashboards galore, there's a very robust research and clinical data infrastructure. And so the idea of really proving whether what we're doing is working is already pretty embedded in the culture. So that's one thing that made it easier. And we're an academic medical center, so people understand about rigor and about research and about randomization and about the importance of design.

Leora Horowitz: 03:31 And they understand most importantly about confounding and bias. So in a sense, the culture here made it easier to accomplish the work than it might otherwise have been.

Adrian Hernande...: 03:46 Now, one of the things that people often talking about is that everyone loves the idea of a learning health system. And then when you go to an administrator and describe actually doing randomized trials embedded in the healthcare system, they often get concerned about timelines and budget and they need answers now or at least within a year. How did you approach it with your administration?

Leora Horowitz: 04:15 Yeah, that is a real concern. And historically, I think researchers have not always done a good job of making sure that what we're doing is on a timeline that matches what people need. So that is a legitimate concern. A couple of things helped in that regard. So the first is that I run a center at NYU Langone, the Center for Healthcare Innovation and Delivery Science and it's the job of our center to link research and operations to bridge the medical school and the hospital. That's our whole function is to be doing rigorous work but in the health system in a practical applied way.

Leora Horowitz: 04:55 So we've already set up the sort of infrastructure to be doing our research work in a way that aligns well with operations. And second, it also helped honestly that the hospital administration had asked us to do some evaluation for them on work that was not randomized. So for example, to evaluate their existing care management program. And we were able to show them that it was very hard to do that evaluation given the degree of confounding and bias that was present. So if you have a care management program and you call everybody up and half the people answer the phone and then of that half the people who answer the phone, half of them say yes, they'll participate.

Leora Horowitz: 05:38 And of those half that participate, half of them actually participate through the end. And then you look just at the

outcomes of that tiny fraction that participates through the end, they look great. And so we were able to very clearly show the institution that that the fact that those few patients look great does not, in fact, mean that their care management is effective. And we were able to really describe all of the biases that accrue in that sort of evaluation. And so then when they said but we really want to have a care management program that works and we really want to know if it's working then it was an easy next step to say, well one way we could do that and have confidence in our results is to randomize.

Leora Horowitz: 06:19 And so they had already experienced the challenges of not using randomization and of just using sort of observational data and and they already understood that that was ineffective or challenging. So that also made it easier.

Adrian Hernande...: 06:35 Wow, that's really impressive because it certainly makes sense that one could go down the wrong pathway potentially spending lots of money and being precisely wrong and doing them better randomized trial helps address that. Now, you talked about ideal projects and their characteristics. What's been the most ideal project that you've all carried out at NYU?

Leora Horowitz: 07:06 Well the characteristics of an ideal project that we've been working out over time are several fold. One is they need to have high volume for precisely the reason that you asked me about before. We don't want these trials to take five years to get a result. So we want whatever we're testing to be occurring often. And by often, we mean something like at least a hundred times a month, but most of ours are in fact even higher volume than that. Second is we want there to be a pretty short term outcome for exactly the same reason.

Leora Horowitz: 07:40 So we don't want to wait five years for the patient to have a recurrence of their cancer or something like that. That's not a good use case for this purpose. We also need the outcome to be already collected. That outcome needs to be part of our usual data collection activity and that's because these are embedded in our existing health system. That's what makes this a learning health system intervention. So we cannot be asking our staff to be collecting new data and doing new assessments and looking for new work.

Leora Horowitz: 08:17 So that's another important characteristic and that excludes a lot of important projects. Like we don't do projects that are looking to improve quality of life or physical function or things like that because that's not an outcome that we routinely

measure. So high volume, short term outcome already routinely collected, and the last is it feasible randomization strategy. Again, we cannot be asking our frontline staff to be drawing cards out of envelopes or doing randomization on the front lines. And we cannot be asking them to create new databases tracking who's been randomized to what.

Leora Horowitz: 08:53 So we need to have an ability to automatically randomize or to use pseudo randomization in a way that allows the staff to do the work. So that's a long intro to the question of what's an example of an ideal project? So I'll give you one example, which is we call every patient after they go home from the hospital. Just about every patient that's 20, 30,000 patients a year we're calling and we ask them if they've made a followup appointment, if they have their medications, if they need any travel help, if they have any concerns, if they are feeling sick.

Leora Horowitz: 09:32 We are trying to early on assess how they're doing so that we can hopefully avert a readmission by intervening early. This is very resource intensive. It has a high volume. It has a short term outcome. They either get readmitted or not in the next 30 days. That's an outcome we're already collecting. We already knew that and so it meets all of our criteria for a good project except for the randomization scheme, which is a little tricky. So the way that our callers do their job is they have a list running on the computer that just shows everyone who's been discharged from the hospital.

Leora Horowitz: 10:13 And as someone else gets discharged, they add that name pops up on the list. So we didn't really have a good way for them to randomize that list as it was occurring, but we could filter it. And so we filtered it and only showed the odd number of patients, patients with an odd medical record number, and so that's was pretty random. And it was invisible to the callers. They didn't know that there were even number people being discharged. And that was an easy way for us to randomize who was getting the calls and who wasn't.

Leora Horowitz: 10:45 And we discovered after a very short time that in fact those calls were not reducing readmission rates at all. And in fact they did not even increase patient experience ratings, patient satisfaction with the hospital. So they were accomplishing virtually nothing. And that allowed us not to fire all the telephone callers, but instead to reassign them to only call the high risk patients using a different script that we're testing now and allowing us to really focus in on who we think we might be

able to affect potentially therefore making better use of our resources.

Leora Horowitz: 11:22 So that's another trial we're running now and if it doesn't work then we'll test something else.

Adrian Hernande...: 11:27 That's a terrific example. And I think it's something for all of us to learn. Can you talk about the issue around quality of care versus research, quality improvements versus research? It's something that I know you've directly addressed and how you put the program that you're leading into that framework.

Leora Horowitz: 11:57 Yeah. This is a very gray area. It really and there is no hard and fast rules that we have found that are easy to apply and the federal government provides some guidance but even that guidance is a little vague. So we sat down with our institutional review board director before beginning any project and spent several months really hammering out how we think about quality improvement versus human subjects research at NYU Langone. And we really tried to sort of characterize the differences between the two.

Leora Horowitz: 12:36 And again, I will just say that this is an overlapping gray complicated area. Fundamentally though, we feel that quality improvement is really about trying to get what we already know to be best practice or evidence based care provided routinely and most effectively as opposed to research where we're trying to understand what is the best practice, what should we be doing, is this medication even effective. Second, quality improvement is really done by the people on the front lines who are delivering the care and implemented right away.

Leora Horowitz: 13:09 So the point of a quality improvement intervention is to see can I get this best practice implemented more effectively? And if so, you just do it for everybody. Whereas research, you will discover whether something is effective or not. And then you might or might not apply that across your health system, but it's not obligatory or even frankly very common to do that. So those are some of the sorts of distinctions that we make between quality improvement and research. And we built a checklist based on some of these rules.

Leora Horowitz: 13:42 And before we start any project, we go through this checklist and we see can we feel, does this seem to meet the standards of quality improvement as we've defined them here at NYU. And if so, we fill out the checklist, we print it up, we sign it, put it in a file cabinet, and that's our sort of due diligence for our

quality improvement versus research. As a consequence, the vast majority of these projects are do qualify for quality improvement status, which means they don't qualify as human subjects research and are not subject to some of the regulations around that.

Adrian Hernande...: 14:19 Terrific. So last question. How much does all this cost? It seems like you guys are doing a lot.

Leora Horowitz: 14:30 We are doing a lot. We do about 10 trials a year usually. Well, we have specially hired for this program now one full time program manager, two full time research assistant sorts of people, about a quarter of data analysts whose job it is to do the analysis, some fraction of a person's time in our research IT core who's pulling the data out of our electronic health record. And then we have a little bit of a statistician time and of course my time for oversight. Collectively, that's about 250, $300,000 a year.

Leora Horowitz: 15:16 However, I will say that there are many other costs that are just covered in kind by the institution. So the IT department has been wonderful about creating new best practice alerts for us and then changing them six weeks later after we've run one iteration and then changing them again six weeks after that when we want to run a second iteration and creating new filters for us and new registries and lists and so on. And they do all of that without charging us. Again, the institution considers us part of the way we do business here.

Leora Horowitz: 15:48 One thing that we do here is we are a learning health system. We are iterating. So they just fold that into operational costs. And similarly, the the staff who meet with us to plan all these trials and to talk about them and to see how they're going and to brainstorm about them, we don't pay them for that. That's again considered part of their job here at a learning institution. So there are other costs that we're not officially counting.

Adrian Hernande...: 16:14 Well, terrific. So you all have really been leading the way, and I hope everyone else can lead by your example in creating a learning health system through randomized trials embedded into the system. So, Leora, thanks for spending time with us on this podcast and please join us for our next podcast as we continue to highlight interesting areas in the research world.

Leora Horowitz: 16:39 Thank you.

Adrian Hernande...: 16:45 Thanks for joining today's NIH Collaboratory Grand Rounds Podcast. Let us know what you think by rating this interview on our website and we hope to see you again on our next Grand Rounds Fridays at 1:00 PM Eastern time.