

AACP: Embracing the PBRN Model to Improve the Medication Use Process
Friday, February 23, 2007

Experience with PBRNs: Where We've been and Where We're Going

James W. Mold, M.D.

Professor and Director of the Research Division,
Department of Family and Preventative Medicine

Network Director of the Oklahoma Physicians Resource/Research Network

Earlene Lipowski: At this time the good news is if you didn't come with questions already - you told us you did, you submitted them, and we've compiled them - Lyle's given us a bunch more. And what we really need to hear now, I think, is that this big elephant, this big huge challenge, we can tackle. One of our pharmacy alumni at the University of Florida likes to tell us how do you eat an elephant? One teaspoonful at a time. So for the first teaspoonful we need to hear from some folks who've been out there trying to organize some research efforts, trying to get at some of these questions. And I think what we can hear from them is some inspiration that if you take it one spoon at a time, one step at a time, and just begin, that perhaps we have an opportunity to move our agenda forward.

We have a phenomenal group of speakers, folks who are well known in the arena of practice-based research, but even amongst that group Jim Mold, our next speaker, is considered to be someone extraordinary I would say. He's done a lot of creative thinking and moved his PBRN research and network forward. So I'm very happy to welcome Dr. James Mold, professor and doctor of the research division in the department of family and preventive medicine at the University of Oklahoma Health Sciences Center. He's president and chairman of the board of directors of the Oklahoma Physicians Research Network which is OKPRN. It's a primary care practice-based research network that has 235 clinicians participating in their projects throughout the state. And in addition to that, Dr. Mold serves on the steering committee of the Federation of PBRNs. So very well qualified, and very pleased to welcome Dr. James Mold.

James Mold: First test the equipment here. Can you hear me in the back? I think it was probably Grace Kuo that was responsible for asking me to come here. And when she asked me, my first thought was fear and trepidation because the last time I spoke to a group of pharmacists I almost incited a vicious riot. And the worrisome thing about it is, I don't even know how I did that. Mostly I spent the time—as I recall - I spent my time criticizing doctors. So anyway, I'm going to try to be a little bit less provocative this time.

The title that was given to me suggests that we ought to talk about the past, present, and future as I see it. I mean, that's the only way I can describe it, as I see it, and through what as some people would consider a somewhat peculiar mind. So but I can tell you that the evolution of my thinking about PBRNs is something that can be compared to this very brief joke. A man walks into a bar with a frog on his head and sits down at the bar, and the bartender comes up and says, "Where'd you get that?" And the frog says, "I don't know. It started like a little pimple on my butt." So I

came into this thinking one way and I'm at this point I'm thinking in an entirely different way. So I'll try to illustrate that as we go along.

I've never been much of a historian so the past part will be fairly brief, talk mostly about the present. And I'm definitely not a very good fortune teller, so the future will be brief as well. So again this is the evolution of my thinking and I think of many of the people who are in the PBRN world. Why would you have a PBRN? Well, the obvious answer is access to large numbers of patients and lots of data. Real world data. And that's in fact how the PBRN movement started.

So initially the very first networks we had were regional and national cancer networks. And then there were some surveillance sorts of networks. It sprung up in other countries, Australia and the Netherlands and Canada. And that was back in the '50s and '60s. And then the concept emerged that, well, maybe these networks might be good for helping clinicians actually do their jobs better, instead of just sort of collecting data for national and regional purposes or big research projects, maybe they actually are good at helping clinicians do their jobs better. And a premier example of that kind of thinking is the Dartmouth Co-op. And I don't know how many of you are familiar with COOP charts, but the Dartmouth Co-op developed a method for finding out what people actually—how people actually were doing in a very quick way, so that clinicians could address their real concerns at the time of the visit, not just what diseases do they have, but how are they feeling, how are they functioning? And these COOP charts are the little stick figures. Anybody familiar with the COOP, charts?

And then the ambulatory sentinel practice network, which I'm sure John talked about last night, answered some questions of real concern to clinicians. They were being told they should be doing things that didn't make sense to them, like doing CT scans on every patient with a headache. I remember when I was in medical school—I went to Duke, up the road—there was an infectious disease expert who probably is still there, who told us that because you can't tell which sore throats are strep, you have to culture every sore throat. And I'm thinking to myself, "My God, what's he saying?" I mean, how many of you get a throat culture every time you have a sore throat? I mean, it's just not possible. So, anyway, that's what the ambulatory sentinel practice network thought also, and they did some very provocative studies and lasted for a number of years and led the way for many of the rest of us.

And then in 1986 when HIV became an issue people who were taking care of HIV patients developed networks to try to improve their care of those patients. And then along came AHRQ, and the Agency for Healthcare Research and Quality developed this acronym called TRIP, at least I think that's where the acronym came from, Translating Research Into Practice. And so translational research was born and the networks embraced that as something that they thought that they could do. So at the same time we had clinical practice guidelines emerging and the issue was how do you get practitioners to follow the rules? I mean, that's still the concept that many people have about translational. I hope you see how that sounds when I say it that way.

So HRSA in 1993, this applies to primary care, particularly family medicine, but the family medicine departments depend fairly heavily on HRSA money, Title VII grants. And around 1993 Title VII said we want to try to build research capacity within family medicine departments and other primary care departments, I assume. And so they started funding networks. So there was a birth of networks as a result of that funding effort. And then AHRQ in 1999 began to fund

networks, and I'll show you in a minute what happened then in terms of the number of networks. And then AHRQ interested other agencies like the National Cancer Institute in helping to fund networks. And then in 2005, a year that will stand as a landmark in many people's minds, the National Institute for Dental and Craniofacial Research committed \$75 million to establishing three dental practice-based research networks. And all the rest of us stood in awe and envy and so jealous that basically these networks were given this like \$25 million and told you can study anything you want to, create these networks, study anything you want to, you have to produce a certain number of studies and we'd like a lot of them to be RCTs, but go to it. Oh, man.

And then the IECRN study, the National Institutes of Health said, "Well, what's this about networks, and, gosh, this sounds like a really a good thing." And they knew that. They had some networks that they were funding themselves, but they commissioned a study by Westat called IECRN. And if you go to, I guess you can't really Google IECRN, well, maybe you can, IECRN, you'll probably get to the IECRN Web site. And that is an inventory of all the networks of all types and also it has some reports. They're not real easy to find because I just printed one the other night, but there are reports in there that tell you sort of what the networks that currently exist think about things like training and professional development, funding, organization, IT, data management, those kinds of things. It's a really very useful, I think, Web site.

So then some of us, as we've been working with these networks, my network started in 1994 with HRSA money, and we started thinking in terms of, well, what exactly are these networks good for and why do the practitioners belong to networks? And we seem to be sort of working at this interface between research and what traditionally have been called quality improvement. So I go to my research administrators at my institution and I say, "You know, we're doing research on these practices," and they say, "Well, what kind of research is it?" And I say, "Well, it's sort of, you know, we're trying to help the practice to do a better job and figure out better processes and so forth." So they say, "Well, you mean clinical trials?" And I say, "Well, not exactly clinical trials." And they say, "Well, so health services research?" "No, no, we're not looking at big data sets." So we started thinking, well, what is it exactly that we're doing, and so I'll try to explain. I said, "Well, you know, you guys in the laboratory you developed this pneumococcal vaccine because you knew what the antigens were and so forth and then you tested it to make sure it was safe and effective; and what I'm trying to do is I'm trying to make sure that it actually gets to the right people at the right time in the most efficient way." And they say, "Well, gee, that's quality improvement, just do it." Here, we give you this vaccine, it works, just give it, just do it. And I said, "Well, you know, it's not quite that easy." And so anyway we started playing around with this interface between research and quality improvement and gradually then where we are, I think, at this point, at least in my peculiar way of thinking, is that these networks are more than laboratories; they're actually becoming learning communities. And so we're actually trying to figure out how we can share success stories and wisdom and sort of create new knowledge but in the context of relationships and group process. That's sort of where I think we're going with this. And that makes traditional researchers fairly uncomfortable. So maybe that's not where we'll end up going, but that's where it looks like we're going.

So in the 1990s we had these IHI learning collaboratives. Are any of you familiar with learning collaboratives? This started to push the envelope with regard to the interface between research and quality improvement because quality improvement traditionally is something for internal use. So you do something to try to improve your own practice. You don't publish it, you just kind of

use it to improve things. That's traditional quality improvement. But these learning collaboratives started to bring together practices from—that were totally unrelated to each other and started collaboratively trying to improve quality and publishing their results. And there started to be journals of quality improvement. And so is that quality improvement? Or is that research? So that's the interface problem.

We—I'll tell you a brief story of how this evolved. I was visiting one of my docs in my network and he said, "I'm tired of the quality improvement organizations coming in here and telling me what a lousy job I'm doing and then never telling me what I can do to improve. Could they just please tell me who's doing it well? Maybe I could give them a call and go over and visit and see how they do it." So we developed this notion of best practices research which is try to identify people who've been successful and then spread what they've learned to other people. Is that research? The first paper that we published had the reviewer said, "Gee, that's really interesting, can they do that?" So I think part of practice-based research is developing new methods. I don't think the methods that we have now are adequate to answer the questions that we need to answer.

There are lots of questions of the sort what's the best way to do X? And there's not a really good method for that. I mean, there are methods, but they take years and years and years and by the time you've answered it, the world has changed. I don't think this necessarily applies to pharmacy, but we're trying to answer the question what do you do when a patient tells you, "Doc, I sweat at night. Why do I sweat so much at night?" How do you answer that question? Well, we started out looking at the epidemiology of night sweats and sort of the correlations, the associations between that and other symptoms and other diseases and so forth. But if you go to the next step that says what's the workup supposed to be, there's no method for that. If you have a method, tell me at the break. Think about that one. You know, we just don't have the right methods to answer some of the questions we're trying to address.

So here are new startups, new network startups. And these are just primary care networks. These are the networks that belong to the Federation of Practice-Based Research Network. So there was the Dartmouth Co-op way back in 1995 and then Aspen and the Minnesota Academy Network a little bit later. And then there were several networks that started up including John's UPRNet, I think I have you in the right place there chronologically, and several networks that started up. And I don't know where those folks got their funding. I think those are the true pioneers who just said, "You know, this is really important. We need to do this." And then HRSA started putting in some money and we had the birth of several networks like mine. And then AHRQ - and you see what happened with funding for primary care networks as soon as AHRQ got involved.

So, gee, I thought this was, you know, I had an understanding of this. This is family medicine basically, you know, the birth of the specialty in 1979, you know, with some pioneers and then HRSA money which helped the primary care departments and so forth. But the trouble with that is these are the specialty networks that had nothing to do with any of that. And so it's something in the air. This is sort of the pattern of how networks have started. So we had some early ones in the 1950s, in 1955, and then a little bit later a flurry of other ones, and then birth of lots of networks recently. Seems to be a trend.

There are a few pharmacy and pharmacology networks. I don't know anything about them. This is what I got off of the IECRN Web site. So there's the Pediatric Pharmacology Research Units

Network, Therapeutics Development Network. Pharmacogenetics Research Network sounds like a pretty interesting one. And you can see what they say they do. You're probably familiar with them. But these are the only ones that were listed on that Web site. So if there are other ones in the audience, for example, you might want to try to get your name on that list.

So John gave you this definition last night. I won't dwell on that. And here we are to the present day and here's what I think a network has to have. These are the ingredients for a successful PBRN. First it has to have a home. And the home is usually in primary care networks it's usually an academic department. But it doesn't have to be. The PROS network is located in a professional association, the American Academy of Pediatrics. And the American Academy of Family Physicians has a network also, the National Research Network. Our network happens to be of the separate, private, non-profit type so that we have a 501(c)(3) organization that is the network, and we have researchers at the university that work with that organization. There are foundations that have networks like the cystic fibrosis foundation and so forth. So there are lots of different types of homes. Each one of them has its own advantages and disadvantages.

You know, being a 501(c)(3) non-profit, we just recently sent out a request to our members for charitable contributions and they actually sent them in. How about that? We were told it couldn't be done, you know, because a lot of our meetings that we go to say, "How can you get practitioners to join the network? How do you entice them to join the network?" And I say, "Well, if you have to really entice them, if you have to work that hard at it, then probably you're doing it wrong." Basically there has to be value, and I was trying to figure out that triangle, how that fits with this notion of value. But everybody in the network has to perceive that there's value. And if there's value they should be willing to actually pay a membership fee. In fact, that's what I wanted to do but my board wouldn't let me. So we got charitable contributions.

And then the NIH has some of its own networks like the National Institute for Craniofacial Research. So then the next thing you have to have is an acronym. And this is really—this is really, really important. An acronym is crucial. And so we have in primary care networks, we have IRENE which is the Iowa Research Network, NYCRING, which is the New York City Research and Improvement Network, CAPRICORN, the Capitol Area Primary Care Research network, ACORN, that's a bad one. If you ever Google ACORN I mean you get . . . , and then GRIN which is Great Lakes Research and Practice Network. But there are some acronyms still left available. So we have—so I really think somebody should jump on SCHNAPPS, Securing Community Health in North America through the Application of Population Pharmacy Science. But it is worth working on your acronym.

The next thing you need is a mission statement. And the mission statement is extremely important, even though it takes a while to develop. That, I understand that, everybody's bored with that strategic planning process, but really your mission statement drives everything else. This is very important, particularly in this kind of an organization. So you have to know what you're about. So here's some examples of mission statements. This is ours, OKPRN, to improve the quality of primary care services in Oklahoma by developing and sharing resources and connecting relevant practice-based research. Now you notice there are two really critical, three critical pieces of that mission statement. One is that we're about primary care services, so we're focused on improving practice. We're not focused on patients. I mean, ultimately we hope that patients will improve as a result of our activities. We're focused primarily on practices. And

we're focused on Oklahoma. We're mostly interested in improving things in Oklahoma. And we're not just about doing research. We're also about developing and sharing resources. So this is an interesting evolution in my thinking from a pure academic approach where I thought research was the product, to then thinking in terms of research and development, and then thinking in terms of well, you know, the product really has improved here.

The PROS network, on the other hand, which is the pediatric network, says that they want to improve the health of children. And you'll see how that translates then into their advisory board, who they include on their advisory board. And then the Oregon Network, to improve the health of rural populations in Oregon. That has implications. So then you need an advisory committee of some sort. And nobody, I don't think, has the perfect organizational scheme, or I mean there's no one way to do this, I guess is the way to say that. But generally there's some kind of advisory board. And I would suggest that that advisory board should include people who are committed to the mission and can contribute to the mission and also have access to money because all of us operate on a shoestring at this point - except for the dental networks. But the rest of us are scraping for money most of the time. And so on my advisory board I have the state epidemiologist and he has access to CDC money. And I have somebody from Medicaid and I have somebody from the Quality Improvement Organization, and they all have—and they have access to CMS money. And so together we can pool our resources and we're all committed to the mission. And for PROS now, because they're focused on the health of children, they have parents on their advisory committee, you see? So it matters what your focus is.

And then you have to have members. And in the primary care world, I don't know if this applies to the pharmacy world or not, we have this debate about whether we—our members are our practices or whether they're clinicians. So some networks enroll only practices. Everybody in the practice has to agree. And the theory is that in order to change practice it's a complete system. You can't just work with one piece of it. You have to work with the whole thing in order to improve it. And then others of us enroll clinicians. But maybe it depends somewhat on the definition of a practice. So we tend to fudge and say, well, we actually usually work with a clinician and a nurse which we say is a practice because that's the unit that can - actually has the authority - to make changes in the kinds of processes that we're talking about. Anyway, it's just something to think about.

And then you have to have researchers. But you have to have a very special kind of enlightened and educated researchers, and perhaps there should be a training program for the types of researchers that you need to work in networks. And the broader your mission is, the more flexible the researchers have to be or the more researchers that are needed. Now the traditional model says that a researcher builds an area of expertise and works on that research agenda throughout their entire career. That's fine. That's a perfectly good model except that then if the network as a whole decides it wants to pursue certain kinds of activities, there may be a very limited role for that particular person depending on what those activities there are, because it's unusual for a network to have such a narrow focus as a researcher. So you either have to have a whole cadre of those researchers with a lot of different little areas of expertise, or you have to have a very different kind of researcher which is the one who is a servant and says, "I will help you do whatever you want to do in order to achieve the mission." Or maybe some kind of blend of those two things. And that's still being worked out. But I think John would admit that he did lots of literature reviews and studied up on lots of problems that he knew nothing about to begin

with because the network wanted to look at those things. Is that correct? Yeah. So that's all the way to the left-hand side of this spectrum. It's where I am. You know, we do lots of stuff that I knew nothing about coming into it. And so I've become a methodologic expert. I'm not a content expert necessarily to start with.

They also, the researchers, need to be willing to be consultants rather than always the leaders that make all the decisions. There's a big, at least in primary care, there's a huge culture gap between practitioners and academicians. And that has to be understood and there needs to be, well, I mean, the language for example. You can't—when I go out and talk to practitioners and it's so funny listening to new directors saying, “You know, well, how do you find out what the questions are of interest to the practitioners?” Well, the first thing is you don't go and ask them, “What questions do you have?.” It doesn't work. I mean, that's an academic world view. You know, you go out and you have lunch and you talk about their frustrations and the problems and the challenges they face and the things they'd like to see different, and then questions emerge from that. But you don't say, “What research questions do you have?” Okay.

So there are some useful skill sets that researchers should have. They should understand the model of community-based participatory research—they wouldn't necessarily always use that method. They should be very familiar with it. They should know something about qualitative research and mixed methods. They ought to know something about cost and cost effectiveness analysis. And they ought to have some access at least, to people that know about hierarchical modeling techniques because you're always looking at patients within clinicians, within practices.

And then you have to have money. Some people would have put that first. But my belief is, and this is where I have a—some would say—I have a peculiar mind, I would say that you should do things that matter and the money will follow. It's been true for us. Do the things that make a difference and somebody will notice and somebody will pay you for that. There are plenty of people out there willing to pay for good things. That's what I would say. But that takes a lot of faith. See you in church. I mean, that's what the preacher says, right? You do things that don't make sense because it's the right thing, to do it anyway. So - but I do believe that that's true.

Keep your eyes on the mission. Remember, and this is something I had to learn, that research is not the goal. I can't think of how many meetings where I go to where people say we've got to do more research, we have to do more research. It's not the goal. Research is a strategy. We need to improve care, that is what we need to do. We need to improve care and we need - to use research methods, when appropriate, to improve care. But in an academic world, you know, we've got this research engine that basically drives the tenure and promotion process and, you know, so we start thinking in terms of research as a goal, it's not.

Be creative. NIH may not be the best place to get money except if you're a dentist. There are many other sources of funding for this kind of work. So we do a mixture of grants and contracts. You know, we work, as I say, with Medicaid and with the state department of health quality improvement organization and so forth. There are lots of sources of funding to do this kind of work other than NIH grants. But that may require some negotiation with your administrators in the academic center.

I ran into our head research people in Washington. I was at a meeting of AHRQ and they were there to try to get a national—to get a cancer institute funded and they said, “Well, hi Jim, what are you doing here?” I said, “Well, I’m at an AHRQ meeting.” They said, “A what?” And I said, “AHRQ, you know, the Agency for Healthcare Research and Quality.” They said, “What’s that?” And so even, you know, in our world AHRQ is a big thing, but in academic circles NIH is the only thing that matters. But in this case NIH may not be the best source.

So what are the products of PBRNs? What do we do produce? And this, I would say, is in the order of importance. The first thing we produce is renewed enthusiasm for excellence. Our members think differently, behave differently, practice better, just as a result of the membership. That’s a good thing. I mean, you won’t get anything on your CV for it, but it’s good. The second thing is relationships which didn’t exist before. I mean, a lot of our primary care docs are totally isolated from other doctors. And this is great for them. It’s the same guy that I was talking to about, you know, the quality improvement issue and if you could just find somebody that knew how to do it better. He sat me down one day and said, “Jim, you know,” (we were planning our convocation, our annual meeting), he said, “You know, Jim, it’s all about relationships really.” So allow plenty of time for breaks.

And it’s about success stories and best practices. And it’s about development of resources because a lot of our practices, and again I don’t the difference between primary care and pharmacy, but primary care practices are resource poor. I mean, you can put almost any resource into a primary care practice and improve quality. I mean, they are just on a very thin margin of profitability. And so anything you can bring in there is good. So I’ll give you an example of the clinical directors network which is a network of Community Health Centers, mostly in the east I think, about 100 Community Health Centers. And what their directors said to me was we participate in all these large randomized trials funded by NIH because they want us in there; because we have all these under-served populations. But we’re using them because they come in with resources. They come in with money, with training, with educational materials, with equipment, all kinds of stuff. We’re using them to improve our practices because of the resources they can bring in.

And then of course there are publications and reports and we’ve developed a fair amount of software and other technologies. By the way, publications and reports, if the goal is to improve practice, not too effective, not too effective. I mean, not to be—I mean, you should do it. I think that some good things come of it. But if that’s your main strategy for dissemination and implementation, it’s not very effective.

So here’s some—I sent a listserv question out, query out, to the members of the Federation of Practice-Based Research Networks and asked them to give me examples of projects that they had done that were multidisciplinary, particularly if they—well, I said multi-, involves somebody other than doctors. And I think it got the most responses of any listserv question ever went out. I mean, it was a very lively response. And most of the examples were with pharmacists. It was like 80% of the examples of multidisciplinary work were with pharmacists. And here’s just some examples. And I’ll just let you read those for a minute. And I assume you got a copy of these slides so you’ll have the email addresses of these people if you want to contact them. This one in Buffalo is extremely interesting. They use a—they have a at least one pharmacist, I don’t know if they have more than one, that do essentially disease management services for a number of

practices within the network from a central sort of virtual location where they get data and they look at that data then they send out recommendations and they somehow help in the management of these cases.

So the CTSA awards, my take on that is that they—they're going to replace the GCRCs, the General Clinical Research Centers, they're going to strengthen training programs. They might strengthen ties between academic medical centers and community-based clinicians. They might do that. I think they will, in some cases, do that. The NIH has made it extremely clear that they're mostly interested in funding first phase translation which I'll show you in a minute, or John showed you last night, which is between basic science and human science. That's what they're mostly interested in funding. They do understand, they do want the whole spectrum. They want the whole pipeline or roadmap but they just don't feel like they can fund the whole thing. And so they say, "You know, we're going to give you this CTSA money and you need to figure out how to, you know, fund the whole spectrum." But really investigator-initiated grants are still going to be mostly that basic science, human science in the translation there. They might make research more outcomes oriented, but I don't—I see precious little evidence of that so far. And it could either increase or decrease NIH funding for practice-based research. So we're all waiting to see.

So this is the diagram that John borrowed from me for last night. And in dark blue is the box that NIH did not include. So that's something I stuck in there. That's not NIH. NIH says that once you do efficacy trials that we will give you the guidelines and just do it, damnit. So and what I'm saying is that you have—there's a step in between that is called practice-based research or community-based research. That's the same box. And that when you add that box there which is the blue highways on the NIH roadmap is then it creates—it breaks translation, it breaks the second phase translation into two pieces. And the second piece is quality improvement. So that final translational arrow that's a two-way arrow is quality improvement.

And here the blue boxes which may or may not show up well in the back, the blue boxes are where most of the work of practice-based research networks has been concentrated. We haven't done a lot with dissemination research though it's not unreasonable for us to do that. Just a word about the difference between translation and translational research. So translation at third phase translation is quality improvement. Translational research is research about quality improvement, what quality improvement techniques work. Those are randomized trials. We've been doing a lot of those randomized trials, testing one method versus another in terms of how do you help practices, and remember I used the word help, how do you help practices improve what they're doing? How do you help practices incorporate the evidence that we have into practice, not how do you force them to do it or how do you coerce them or whatever.

So our definitions we're using are practice-based research is research that's grounded in, informed by, and intended to improve clinical practice within a relatively short period of time. That relatively short period of time is crucial if you want to work with practitioners because they want the answer tomorrow which is a lot different from academicians. So one of the things about these networks is we have to develop rapid turnaround cycles. We need to actually produce something that's useful and we need to be in communication back as often as possible about how things are going to keep them engaged.

So now when I go and talk to the folks in our academic center about what kind of research I do, I have no trouble. I do practice-based research. And if they don't know the definition I'll give it to them. That's what I do, practice-based research. And I also do a fair amount of translational research which is different. Translational research focuses on the arrow; practice-based research is in the box. Now, an example of practice-based research would be effectiveness studies. So somebody puts out a guideline and it's not a guideline really, it's a sort of a proposed guideline in my opinion until it's been field tested. So we'll field test it. But we'll see things like how many people even qualify? I mean, is this as big a problem as you thought it was? How many people have to be opted out because they don't meet the criteria for getting into the—for use of the guidelines? And then what really happens when you apply that guideline? I mean, do people actually follow the rules? And even if they follow the rules does that—what does that do to costs and what does it do to outcomes? So that's practice-based research, one example. There are many types of practice-based research. So the night sweats question is another type of practice-based research.

I don't want to forget about surveillance. Remember, we started with that. And that was one of the initial thoughts about what networks were good for. And, in fact, it's still a pretty good idea. I mean, you can do some really nice surveillance work in a network. And I think, you know, whether you consider that research or not I think you should abandon the notion of focusing just on the traditional definition of research and think about what you could do if you had a cohesive network of pharmacists, pharmacy practices, that would be better than what we have now. What would that add to care? Think about it in that way. Research will happen. It has to. I mean, because we don't know what we're doing. Einstein said something like we don't know what we're doing, that's why we call it—that's why it's called research. So research will happen, but focus on the mission.

So let's see. I think this is pretty near my last slide. So I would say the current biomedical research engine is designed primarily to drive the academic tenure promotion system. It takes an average of 17 years for 14% of new discoveries to make it into practice. I'm sure that's been cited before. It's certainly in the paper that we were given. But the research engine of the future must combine enthusiasm for discovery with a desire to make the world a better place. Researchers must understand that they are consultants in this process, not the drivers. And in the end it's most often about relationships and stories and it's relationships and stories that change the world. PBRNs are about those two things. Go out and make more of those two things.

This project was supported by grant number 1 R13 HS016844 from the Agency for Healthcare Research and Quality.

Funding for this conference was made possible, in part, by a grant number 1 R13 HS016844 from the Agency for Healthcare Research and Quality (QHRQ). The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.