McMaster Program for Faculty Development (MacPFD)

Spark Podcast

Official Transcript

Episode Number: 25
Title of Episode: Nature of Evidence | Medical Education Research
Producer: Nick Hoskin
Music by: Scott Holmes
Featured Guests: Dr. Lara Varpio | Dr. Geoff Norman
Interviewer: Dr. Teresa Chan
Date of original release: September 1, 2021

Dr. Teresa Chan (00:02):
Welcome to the MacPFD Spark Podcast. This podcast is meant to inspire you to take the next step in your development journey as a faculty member. We're really excited to bring you all sorts of content: From inspiring you to teach or supervise differently, to leading and managing your team, to thinking about new creative ways or humanistic ways to actually do your work, and finally to up your game in your scholarly practice. Are you excited yet? I certainly am. So sit back, listen and enjoy this latest episode of the MacPFD Spark Podcast.

Speaker 2 (00:44):
Hello, and welcome to the 25th episode of MacPFD Spark. Today, we will be listening to two discussions on evidence and research. First, we will have the opportunity to listen to Dr. Lara Varpio discuss ways of knowing and the nature of evidence in the post-truth era. Next, we will hear a brief virtual discussion from Dr. Geoff Norman, about the founding of Medical Education and med-aid research. Please enjoy the episode.

Dr. Teresa Chan (01:15):
Hello, everyone. Welcome back to this podcast, and I am delighted to have Lara Varpio. Dr. Lara Varpio, again from Services University in the US, and an adjunct scientist here at our merit unit here in faculty health sciences, and we're gonna be talking a little bit about the ways of knowing. Now, this is an odd topic to cover in a faculty development type of a podcast but I think that at the core of it, as people who work in and live in a scientific world, I think we need to wrestle with what it is that we consider evidence, what it is that we consider the truth, I think right now in the, some people call the post-truth era, it's especially important to talk about what is news, what is fake news, what is truth, misinformation, disinformation, meaningful, tactical, political moves are being made on social media platforms, and the world has just changed in the way that we relate to the truth.

Dr. Teresa Chan (02:12):
So I think that breaking it all down and coming back to the core idea of some of the big terms that you hear about when you're at 4.00 AM in a dorm room talking about epistemology, oncology, those are things that we philosophize about when we're doing our undergraduate degrees, but see, we come back to them as scientists, we come back to them as clinicians and we actually think really hard about how it is that we know what we're doing is the right thing.

Dr. Teresa Chan (02:38):
And I think that that's the conversation I want to have with you today because I think it can really help us develop as scholars, as scientists, as clinician, and as teachers, if we center ourselves a little bit. Lara.

Dr. Lara Varpio (02:47):
I'm excited to have this chat with you, Teresa, we're gonna have a great time.

Dr. Teresa Chan (02:51):
Multisyllabic words are always fun to say on a podcast, but yeah...

Dr. Lara Varpio (02:56):
Don't ask me to spell them, that's all I ask.

Dr. Teresa Chen (02:58):
I know, good thing spell check is pretty good, right?

Dr. Lara Varpio (03:01):
Amen, sister. Yep.

Dr. Teresa Chan (03:03):
Alright, so let's talk a little bit about that because I think that we've talked previously about philosophies of science and things like that, but I think at the core of it, there's all different kinds of ways of knowing, right? And knowing if something is true, knowing if something is false is actually more of an art than a science.

Dr. Lara Varpio (03:23):
I think you're right, Teresa, and I think one of the things that I think is really important in our modern era is one of the things that I find often underpinning some of our challenges, some of our political issues, but also our understanding of science is that we all don't come at reality in the exact same way. When you are a bench scientist or someone in that clinical space who is working with this patient or with this particular genetic makeup or this particular pharmaceutical test, when you're in a laboratory space, you can control a lot of variables, you can say that under all of these conditions, X causes Y, but that laboratory space is really artificial. And even clinicians know that when you see diabetes in a clinical description versus seeing a diabetic patient, or two or three, those patients present differently, but they all have a similar underlying condition, but the presentation of it, the lived experience of it is different.

Dr. Lara Varpio (04:25):
We could say the same thing about something as obvious and benign as a road, once upon a time, somebody decided we needed a road between city A and city B, and they looked at the geography and they probably, I hope, considered who was living there and where animals were migrating and all those sorts of factors, waterways and such, their technology capabilities and said, "Okay, given all of these factors, we're gonna put the road between A and B here." But when they did that, things happened, right? Because if you were far away from the road, you became somebody who had challenges gaining access, if the people who put down the road there weren't thinking about populations who already lived there, maybe you were putting a road right through a very important

space in their culture, but maybe you were blind to that, I truly believe that we probably went there for the best of... I would like to believe it went there for the best of intentions, but it has a ramification.

Dr. Lara Varpio (05:17):
And I think that's very true when we start to think about reality today. Yes, nobody's saying there's no reality, this is our space, this is where we live, but our experiences of it are very different, and those experiences of it can be different for a variety of reasons. I don't wanna get into all the reasons here, but I think the important part is to say that this X here, this phenomenon, this concept is true forever and ever and for everyone, it's just not gonna hold water anymore because it's not true for everyone, it's different for everyone. So at best, we can say it's true under these conditions for these kinds of people in these kinds of circumstances, but that's a very contextually-dependent true. So if we're thinking about what is information. I think what... One of the things our community, our culture is dealing with right now is that there are facts. Yes, but those facts are infallible, they're not always true for everyone.

Dr. Teresa Chan (06:11):
Yeah, and I think that that's especially the case in health professions because, like you said, the patient's experience, the clinician's experience, all of those are truths in and of themselves. Yes, there's anecdote and yes, there's hierarchies of evidence and yes, if you have a whole bunch of people, probably there's some semblance of it holding more true, but then there's tensions, they're being introduced by things like precision medicine, because as we know more about an individual's genetic makeup that's gonna wash out a lot of the population level statistics and the technique that we use to interpret the truth, and so we're at a very interesting crossroads right now where science is flipping its own paradigm. If I know that this drug works for all these people in a large population study, but now someone in precision medicine comes along and says. "Well you can get a number need a treat of one if I know their cytochrome P450 makeup and how they interact with a drug.

Dr. Teresa Chan (07:10):
And that's a mind-blowing thing, what we traditionally have gotten for the last couple of 100 years is just, say, "Here's a drug and we're gonna test it with a whole bunch of people, and we're gonna figure out how many people we have to treat, and knowing some of them it won't work on, and some of them... " We have things like number needed to treat. These are concepts that we've evolved because we needed to use population level statistics and numbers and processing of the data in order to make a best guess as to whether or not something will work.

Dr. Lara Varpio (07:38):
Interestingly, if you look at the statistics and the statistical analyses that often lay the foundation for a lot of the things that we hold as scientists or as clinicians to be true, all of those statistics, the definition of a statistical question is a question that has more than one answer, that's part of the foundational understanding, premises behind statistics. Statistics has confidence intervals. There are power calculations.

Dr. Lara Varpio (08:02):
What is a good P value? A lot of that stuff, a lot of those decisions are social constructs, we decide what a sufficiently good n is, we decide what a sufficiently good P value is, we decide how broad our confidence intervals can be to be good enough. So if that means if we decided that at one point, we can un-decide it later. By the sheer definition of it all, our knowledge is temporary, and if we are in

an era where a lot of different factors and social influences are coming to bear and we're recognizing the power that those considerations hold, then we have to start recognizing that even things that we thought were objective and unbiased, well, they're not. They're decisions, and all decisions can be revisited. It's not an easy time.

Dr. Teresa Chan (08:52):
It isn't. I think that's why we're seeing it manifest in... You see it play out in the news and social media and in our daily lives, people are wrestling with exactly the tensions between what we know about individuals and what we know about the populations, and we know inherently as people that what you say for everyone may not actually work for me, and we see that every day in healthcare, we see it everyday in education. I think that that's really what people are wrestling with, and I think that that understanding that and acknowledging that we need to diversify the way that we think about ways of knowing, that we have to acknowledge that a great qualitative study will give you very different information than a great quantitative study. [0:09:34.8] ____ but genomics testing and massive PCR tests that actually help you with customizing someone's genome and then picking the right tailored custom drug for them has its role as well. Now we have to acknowledge all of these different perspectives.

Dr. Lara Varpio (09:51):
One of the things I wanna come back to that you mentioned earlier, Teresa. I think your point here echoes back to it, the idea of hierarchies of evidence. I would really love to see us dismantle that hierarchy, 'cause quite frankly, a different kind of knowledge isn't better or worse, it's different. Different doesn't have to be a value judgment, we can respect difference and see that difference enables us to experience or see or understand, study a phenomenon from different orientations and get a better understanding because of variety.

Dr. Lara Varpio (10:22):
So when I go to a buffet, and Lord knows, I love a good buffet, I want variety, I wanna be able to choose everything or anything I want from the spaces where I'm in, and if I only have one set of ways of coming at that buffet, and I have to just pick these... I have these two items, think of all the richness and flavor and experience that I'm missing. So if you are, in my personal opinion, it's only my opinion, but as a scientist, I want all the flavors of the scientific buffet informing the way I think about a phenomenon, because that will mean that I have a better understanding, it will mean that I'll have a more complex understanding, and honestly, Teresa, I think it also means that I have to become very comfortable with discomfort of not having a finite "therefore this is true, period, we're done." It's uncomfortable when you don't have that certainty, but if you can become comfortable with the discomfort, then what you actually have is a more robust and sophisticated understanding. And I'm all about that.

Dr. Teresa Chan (11:25):
Yeah, and I think that, again, this is another tension for clinicians who have guidelines, it is best guess, but if you talk to anyone who's ever been on inside of a guidelines, it's a political move...

Dr. Lara Varpio (11:38):
It is guessing, right? Yes.

Dr. Teresa Chan (11:40):

They're making the best guess they can based on what the information they have. The people in guideline committees are the most nuanced, they do bring in quality grouping, they do bring in their anecdotes and their experience, and all of that gets wrestled with and then turned into a very highly cited and very respected document that people acknowledge where it comes from, but it's no different from a UN resolution. It has negotiations behind it, it has politics behind it. There's a reason why we discuss about conflicts of interests and influence in pharma. Are they at the table, did they sponsor people to fly there? These are all things... And to see guidelines for what they are, as political structures that are meant to help guide us, and to give us a sense of where to go, and give us a little bit of a direction, but to know that they are still human constructs, that a bunch of people came together and decided, in the best wisdom that they had, in the best access of information that they had at the time, acknowledging that is something that we have to as a field, get over the fact that there's an MCQ answer to every clinical question.

Dr. Teresa Chan (12:43):
And I think that obviously, we do a disservice, add a little bit in health profession education because of the way that we sometimes test our trainees. Like if you have board exams, and maintenance of competence, that's all based on "there is a right answer, there are four options, and you should pick one." Obviously, there's a precedent that's then indoctrinated into generations of learners that there's a right answer, and what it is is that every clinician that's got experience will tell you there isn't really a right answer. And even if you look at what David Socket wrote about EVM, we have to bring the patient into it. It is about the context, it is about taking all of the information out there and then picking the right, best choice with your patient, as a clinician, in the right context.

Dr. Teresa Chan (13:25):
And obviously in the US, you have a very different context with the costs and other savings, and in Canada we don't have to worry about that as much, but all these things are wrestling at the same time, and to acknowledge that it's much more complex, and it's not so easy. And you're right, the hierarchy of evidence isn't heuristic, just like any other, that gets you when you're first getting started, and just getting started with disease medicine. Yes, one study, two studies, multiple studies, yes, there is probably something to be said in that post-positivist framing that as we get more information, as we reconcile them, and combine multiple studies that may contradict each other, that we'll get closer to the truth, and that theoretical basis for it, I think, makes sense, right?

Dr. Teresa Chan (14:06):
And so I think there's a role to use it as one of many guiding principles, but it doesn't mean that that's the only evidence that exists, and it doesn't mean that you have to stop as a scientist once you've learned how to do a meta-analysis, you've arrived. No, you also have to think about how you can now understand how to evaluate a clinical decision rule, or how you think about diagnostic testing, and how you think about what is a marker of rigor in qualitative research, and how does the qualitative work then inform the next question that you have as a clinician, as a scientist, in the field that you're in? Because if no one's using your diagnostic test, because you have to jump on one foot five times in order to be able to do it, and it's just not usable, well, then, guess what? It's probably not gonna be something that advances the field and improves patient care. And so understanding those tensions I think is really important.

Dr. Lara Varpio (15:00):
You're making several interesting points, Teresa, and one of the ones I just wanna reflect on for a minute is the idea that we all need starting points. And we all do need starting points. And when we

are clinicians or researchers working in health care or health professions education, we have to start with the materials and contacts and studies and abilities that we have but one of the things I would very much like to see is that recognizing that a starting point is also not an end point. So if we start with our studies in this space, in these ways to think about this clinical presentation, about this disease, or this way of teaching in one way, let's not decide that that's the only way and the best way, let's decide that that's any way, and that by bringing other voices, other perspectives, other ways of seeing, and knowing to the phenomenon, that we are providing ourselves with different affordances.

Dr. Lara Varpio (15:50):
There is a very famous quote from a rhetorician called Kenneth Burke, and he always said that a way of seeing is also a way of not seeing. So every form of science enables you to see a phenomenon in one way, but it also hides other ways of seeing it, which is why you'll need to bring multiple kinds of ways of knowing, different kinds of perspectives to our scientific inquiry so that we can see the blind spots that we have. Different scientific approaches, different paradigms, different methodologies have different affordances. Those affordances let us see a phenomenon in a way that other ones won't. In my opinion, the multiplicity of that is the best foot forward that we can provide, because it enables us to understand that yeah, we might start over here, but that let me see X, but not any of the other letters of the alphabet. So I need to break out of that, use other approaches, so that I can see it in its entirety.

Dr. Teresa Chan (16:40):
Yeah, I think about it as like the colored lenses, or some people have different abilities with seeing color. Some people are tetrachromats, that they can see all the colors, and some people can't see yellow and blue differentiation. I think that as scientists, we sometimes train within traditions that only let us see red and blue, only let us see green and yellow. And actually, what we should try to aim as we progress our career. So maybe you don't do this in grad school, maybe you do this when you're a faculty member, you explore the other epistemologies, you link up with other scientists. There's always more learning to be done after you've got your PhD, your MD, you can go and learn more. And so as obviously a faculty developer, my plea to people is that when you've arrived as an assistant professor or you're doing a post-doctoral fellowship, that's when you should explore the other ways of knowing because then you will be a stronger scientist. The advent of quant vs qual, it's probably not a versus anymore, it's probably that you need to know both.

Dr. Lara Varpio (17:36):
Yeah, agreed.

Dr. Teresa Chan (17:36):
And even if you don't do both regularly, respecting and understanding and being inspired and knowing enough about how to judge and participate and need critically something from another tradition is actually really important to you as a clinician, as a researcher, as a scientist.

Dr. Lara Varpio (17:55):
I think one of the most important points that we can do as faculty members and as members of a community who cares very much about clinical guidelines and best practices is to have a real diversity of voices at those tables so that many different perspectives, many different affordances, methodologies, ways of seeing informs the way we go about treating... Or the guidelines that we create because that means that we're not myopic. As you said, we have all the colors of the

spectrum, that we see them, and even if we don't understand them fully or even if we are more comfortable with one than another, that by having them all at the table, hopefully it will mean that the guidelines we produce will be more robust, will be a better representation of the complexity of it, and if nothing else, will provide us with a starting point that is applicable to a broader population.

Dr. Teresa Chan (18:46):
Yeah. I think we'll serve our patients, our providers better if we have more diversity. And I think that that's... We're having this conversation in the social context of course, of the Me Too era, of the Black Lives Matter Movement. I think that we are seeing the ramifications of ignoring segments of the population, not giving the voice, not giving them space. And so I guess my plea to those of us who are listening and are engaging in this idea, how can we bring that equity, diversity and inclusion to all the walks of the life that we have? It's not just that you should have an EDI committee, or some kind of leadership position in your department.

Dr. Teresa Chan (19:23):
I think it's about how do we fold EDI into the ways that we do science. Because I think that there are minority voices. It's often... Let's be honest, a lot of the feminist traditions, a lot of the feminized sciences, sociology, anthropology, they've been marginalized historically. They're not part of the hierarchy of evidence. They don't even make it on to the triangle. And so what does that mean? When we set it up, it's probably not that it was with intention, it was a way to make a heuristic, but then now people have run with it in a way that I think now we can take a step back and say, "Well, how can we incorporate different perspectives in? How do we stop thinking of things as better or worse but different?" And I think we're seeing that in the rest of the way that we do business in all walks of life. Whether it's about a selection of who to hire next or what leadership position is available to whom, or as complex as who's gonna be at your table, at your guideline with inclusion of patient advocates and other perspectives.

Dr. Lara Varpio (20:22):
One of the things that I've been reflecting on in this era that we're living in, Teresa, is that this has been a very challenging year, a very challenging few years, I'm sure for some people it's been very challenging decades, but the thing that I hope personally that I come out of 2020 is that if I come out of 2020, and all of my assumptions still hold true and I haven't changed any of them, shame on me. If I come out of 2020, and the practices that I held and supported and maintained haven't evolved, then shame on me. I feel that perhaps the most important thing we can do coming out of this year for me anyway is to take a really hard look at the things that I took as my ways of doing, and my ways of practice in all walks of life, in all aspects of my person, and to say, "Alright, embedded within the way I do this are assumptions and are ways of viewing and privilege." And what I hope that I do is then say, "What can I do to dismantle that? What can I do to be better so that the assumed truth that got us to this point don't retain the power, don't maintain being assumed truths?" But as we said earlier, it's about becoming uncomfortable with that discomfort 'cause it is uncomfortable.

Dr. Teresa Chan (21:39):
And it's uncomfortable when you're just getting started, so if you're more junior, you're not gonna be taking down the hierarchy right now, but it's about thinking about how you message what that hierarchy, "hierarchy of evidence" to your learners, to say, "Look, it says hierarchy, but it's not really a hierarchy." We can be doing little gestures like that to explain that that's the name that it has, and that's how we see it in the literature, and yes there's a lot of power dynamics and you can talk a little bit about how and why it was formed, but I think you can talk about and bring to your journal clubs

and your discussions around things, why does journal club only have to go through the user's guides on diagnostic tests? Why not also look at the qualitative research user's guide, and have people walk through how to critically appraise a qualitative paper? Because it's been written, we do one in our curriculum for emergency medicine. We actually have a module, I run it and we go through the correct checklist, and yes, checklists are a whole different thing we can get into another time..

Dr. Teresa Chan (22:42):
But at least it opens up people's worlds in their first year of residency to say, "This is another format, and you have to also be comfortable with this just like you would need to understand how to look at a new machine-learning model, and understand how to critically appraise that. Science is always changing, always evolving, and we need to stay on top of our game. And so the poor learners that have to listen to this, yes, we're always gonna be moving the mark, we're always gonna be advancing the field, and for all of us life-long learners, we're groaning 'cause we're like, "How am I gonna learn about machine learning algorithms?"

Dr. Lara Varpio (23:15):
Oh my God.

Dr. Teresa Chan (23:16):
I know, that's the nature. I had a good conversation with a colleague of mine who's an engineer working the space, and we actually discovered that although at the time there was no user's guide for machine-learning algorithms in AI, but there is now. You could actually just use the same questions from a clinical precision rule paradigm and just say, "Look, it's the same questions. When you're a consumer of the research, you just have to basically look at it as a glorified souped-up decision rule." And it's a tool to help you guide your decision, and you then need to know how it was derived, how it was validated, and then how it's gonna impact your practice, and it's the same questions. So at the core of it, things don't really change. Again, is it like how did we come to know this is the truth? How did we come to show that that is related to the truth in other ways? And so derive, validated. And then how does it impact on my particular case and presentation right now? And so I think that that's at the core of what it is that we always have to do when we're looking at science.

Dr. Teresa Chan (24:15):
Thank you so much for this great conversation.

Dr. Lara Varpio (24:17):
Oh, Teresa, my pleasure. I always enjoy chatting with you. Thanks for having me.

Dr. Teresa Chan (24:22):
Wow. That was a really awesome first segment of the MacPFD Spark Podcast. And now on to our second segment.

Dr. Teresa Chan (24:36):
Hello, this is Teresa Chen, and I am excited here today to be here with one of my mentors, Dr. Geoff Norman. He is a world-renowned medical educator. Someone who's done a lot of work in both medical education and health professional education, a bit large. And he's an all-star researcher in this field. And I thought I'd like to just have some conversation with him about the founding of this field because it's a relatively new field compared to some of the other fields that we have in basically

the bigger scheme of things around medical sciences. It's not like biology or anatomy or biochemistry, and it's probably somewhat of a newer discipline that's popped up, and I thought I'd pick his brain a little bit about the history of this because I think it's something that most of us who trained since, because of the great work that Geoff and his colleagues and contemporaries have done, take for granted the types of systems that we have now for medical education and how vastly different they are because of the work they all did. So Geoff, please, welcome to the podcast, and I'd love to hear your thoughts.

Dr. Geoff Norman (25:37):
Hi, I'm Geoff Norman. One of my throwaway lines is that nothing at McMaster happened before my time. I've been around a very long time. Next year, I will celebrate 50 years in medical education research, to the extent that there's any history, it's an oral history that's passed on from generation to generation, there are a few exceptions in terms of monographs and books that have been written about it, but nobody knows that they exist anyway. So I thought, "Here's an opportunity for me at least to put down, not exactly in black and white, but at least record some of the early history, 'cause I'm one of the few survivors from that era. Let me do a little test to see how much you Latter-day Saints are on top of things. Teresa, where did medical education research began?"

Dr. Teresa Chan (26:22):
I actually have no idea. That's something that I've always wanted to know, so I don't know if you can...

Dr. Geoff Norman (26:28):
You're about to find out.

Dr. Teresa Chan (26:31):
Yeah.

Dr. Geoff Norman (26:31):
Believe it or not. Medical education research began in Buffalo. Yes, that's right.

Dr. Teresa Chan (26:35):
Buffalo? Buffalo? Oh, wow.

Dr. Geoff Norman (26:38):
You thought they were only famous for chicken wings, right? Well, guess again. There's another set of founding fathers of medical education research, none of whom from McMaster, a guy named George Miller, who was an internist, and he looked like he could be an American diplomat, he was an incredibly handsome man. Grayish, pepper-ish hair straight off, straight back from his forehead, tall, lean, always incredibly well dressed. Anyway, that was George Miller, and he put together the first medical education show in Buffalo, New York of all places at SUNY.

Dr. Lara Varpio (27:13):
Very cool. I grew up in a Niagara, so Buffalo, I spent lot of time there, really close to here.

Dr. Geoff Norman (27:18):
And alongside, let me add Steve Abramson, who was a PhD educator. Christine McGuire, who like me, wandered into the field because she had no other employment. She was an economist. Hilly

Jason. Hilly Jason is a psychiatrist, and I said... The other two I said was, because they're long gone, as is George. Hilly Jason, bless his heart, is still alive and well and still active in medical education. He is in University of Miami. He's about 115 now, I think, I'm exaggerating, but he's well into his 90s and he's still doing it. I hope, to be honest, but I'm not doing it when I'm in my 90s if I make it that far. Anyway, that was the original crowd, and what happened was some time in the '60s, they all dispersed, and Miller and McGuire went to Illinois, University of Illinois, Chicago, which is still one of the big shops. Jason went to Michigan State, and Abramson went to university of Southern California, where he met up with Howard Barrows, and they may be known to a few of you. Howard Barrows, the inventor of simulated patients, and he arrived in McMaster about 1970 or so.

Dr. Geoff Norman (28:30):
Many people credit him and Vic Neufeld with problem-based learning, but that's simply not the case. They proselytized it, they wrote a definitive paper in Journal of Medical Education about PBL, but they had nothing particularly to do with the original ideas, as I discussed yesterday. So if you look at the snapshot of medical education research in the '70s, let's say, there were three powerhouse shops, Michigan State, Illinois, and USC. All of whom directed their lineage right back to SUNY Buffalo. By the way, Sackett was doing residency at Buffalo at the same time that Miller was running the Met Edge shop, and I don't think they were close friends, but they certainly were acquaintances, so it becomes a fairly small world. Anyway, let's see now, where do we go from there? At Michigan State, two other people became very heavy leaders, Lee Shulman, who I mentioned yesterday, and Arthur Elstein, who was a clinical psychologist. And Elstein and Shulman are both still around and I think somewhat active. If you take a snapshot of the rhyme meetings, which go back to the late '60s I think, you would see that a lot of the heavy lifting was done by those places, Illinois, California, Michigan State.

Dr. Geoff Norman (29:44):
And another fair chunk of it was done by the state licensing or the national licensing boards in the US, in particular, National Board of Medical Examiners, and the American Board of Internal Medicine. Clearly, the latter two groups did a huge amount of development work in assessment. Any study of medical education research will find that number one on The Hit Parade in terms of publications and all that is assessment. A number of years ago, a guy named Dave Swanson and I wrote a paper that appeared in the mainstream education journals, basically pointing out that medical education research, because of all sorts of influences, by and large from the licensing and event certification requirements, was way ahead of general education in terms of strategies for assessment. And very clearly, those two groups, national boards, American boards, did all sorts of really pioneering work in terms of developing assessment methods. So that's where the thing began.

Dr. Geoff Norman (30:38):
Europe, marched to a different drummer. There was Association for Medical Education in Europe pioneered by Ron Harden back in the '70s. And many of you know Ron Harden is still incredibly active, he is a human dynamo, but that's where we all trace our roots. Many of the people who, like me, are looking rather long in the tooth, and people tend to think of us as being the grandfathers. We were actually the second generation. And I won't bother listing a long list of names from the second generation because none of them would be known to you, except perhaps me, at least I like to think so.

[chuckle]

Dr. Geoff Norman (31:13):
So that was what it looked like. Most of the publications were coming out of Illinois, out of California, out of Michigan State. McMaster came on board in the '70s. McMaster, in advancing problem-based learning, also somehow recognized that research in the area would be terribly important in terms of ultimately validating the approach. And so quite early on, in 1971 to be precise, they opened up something called the Program For Education And Development. The first director was Vic Neufeld, an internist, who had his degree from Michigan State, and round and round we go. And they went out to recruit some employees, and I was the first. I was basically unemployable, but I got fortunate that they took me off the hook. There were two other people whose names are long forgotten. And we were the original nexus for the education and research group at McMaster. The culture has changed really significantly.

Dr. Geoff Norman (32:11):
Back then, our mandate as PhDs or master's level social scientists or natural scientists or whatever we happened to be, we were told very clearly that your role was to help the clinicians answer their questions. And the clinicians had the really, really good questions, and you just show them how to do T-tests and how to design factorial designs and control groups and all that sorta stuff. And we really had no business in generating questions. That's the way it was, and if you look at my first decade, I don't think I was first author on much of anything really because I was the helper, appropriately so because I didn't know very much.

Dr. Geoff Norman (32:51):
And so much of my learning occurred on the job. That's what it looked like back then. Fast forward to, I don't know, 30 or so years, first of all, the first thing you know is... Actually, if you move forward in time to now, the first thing you notice is that the field has hugely expanded, enormously expanded, unbelievably expanded. Let me just see. I got a couple of graphs here that I just wanna look at briefly. For example, the AMA meeting. The first AMA meetings invited a couple of hundred participants. The current AMA meeting has 4,500 participants. That's the European meeting.

Dr. Teresa Chan (33:30):
That's a big jump, eh?

Dr. Geoff Norman (33:32):
Yeah.

Dr. Teresa Chan (33:32):
Holy cow.

Dr. Geoff Norman (33:34):
My journal Advances In Health Sciences Education, it started in 2000... No, it started about 1995, and 2004, we had 50 submissions a year. This year, we will top 1,000 submissions. I think it expanded hugely, enormously, and everywhere you look. The graph for advances is a little unusual because it started within living memory, but all of the journals report this massive increase, which to some extent makes the field difficult because it's harder and harder to get grants and its harder and harder to get publications. A typical acceptance rate is now around 10% in the mainstream med ed journals, which is getting embarrassingly close to JANA and Lancet.

Dr. Teresa Chan (34:16):
Yeah, it's so competitive now, some of the national medical education grants are probably... Even though they're much less amount of money, they're just as competitive as some of the big CHR grants.

Dr. Geoff Norman (34:25):
Yep. That's right. It's not an easy field, and what's happened is, certainly it's assumed legitimacy in that by any metric you care to name, like H indices and all that sorta stuff, the top people in our field are right up there with the top people in clinical research. What's happened is, as I mentioned, initially, we were the helpmates for the clinicians, and there were very few clinicians, who really were doing it as a hobby and as a passion, but they were... Everybody knew everybody on a first-name basis, it was a small field. But then what happened is master's programs began at Michigan State, and at Illinois, and I got my master's from Michigan State in 1977.

Dr. Geoff Norman (35:05):
And so for those programs, far and away, the majority of them were health professionals who were trying to look for a field of research, and us PhD types were very much a minority. The consequence of that is the field has expanded, I think, primarily on the basis of health professionals moving into the field. And the balance is tipped because, as I'm saying ad nauseam, I was incredibly unskilled when I started. The current generation of full-time medical education scientists are incredibly skilled. They typically have degrees in social or sociobehavioral science with a supervisor who probably had feet in both camps in his or her discipline and also in med ed. People like Lorelei Lingard and Glenn Rigeur and me, we really can claim to have a solid professional discipline at the PhD level, not even.

Dr. Geoff Norman (36:03):
And so what's happened is that basically we've moved from individual clinicians coming up with individual bright ideas to sustained research programs. Typically, in the foreground or in the background is a medical education scientist who does this full-time, and clinicians have a somewhat different role as a member of a team rather than as a leader of a team. Now, of course, there are exceptions. Nobody could... Somebody like David Cook is always gonna be the leader of a team. And there are a number of others, both locally and internationally, but nevertheless, the difference is there's a much more of a professional approach to things than there was back then, which is perhaps not surprising, but nevertheless is there. It's much bigger and it's much more well-defined. It's much more professionally executed.

Dr. Geoff Norman (36:53):
Now the one thing that I haven't mentioned. Again, if you look at the statistics on medical education research, back then in the '70s, it was dominated almost totally by the Americans. Even in Europe, there was very little research being done, and the national meetings that were held in Europe were more social events than research events. Now it's not dominated by the US, the US is number three in The Hit Parade, number one and two very clearly, and they're way ahead of everybody else, the US, the UK, and so on are... Teresa, can you guess?

Dr. Teresa Chan (37:28):
The Netherlands and Canada.

Dr. Geoff Norman (37:29):
You got it. Canada's well out front, and number one, the Netherlands is number two, and if you look at, again, any number of metrics, Karolinska prize winners, national boards, Hubbard award winners, citation classics, top 10 on The Hit Parade in terms of articles, review articles, on and on it goes. Numbers of publications, age indices, all of the above, Canada stands at number one, the Netherlands number two, and then there's everybody else. Now, Canada and the Netherlands are two very small countries, in terms of population, in geography, they're somewhat different, but in terms of population, we're not heavy hitters at all, and in terms of things like Nobel prizes, neither of us are heavy hitters. So what's going on here?

Dr. Geoff Norman (38:16):
A few years ago, a journal called Perspectives on Medical Education was just starting an English language version, and they asked me to write an editorial or... No, somebody had written an article saying how the Netherlands is number one and, "Boy, are we ever good. And why is that?" And they amassed a number of hypotheses, the only trouble was that they weren't number one, they were number two, we were number one. And so I found myself reflecting on, how could that happen? And strangely, of course it's all conjecture, we can't do a randomized control trial of these kinda questions. So take this as conjecture and in fact, take it as perhaps biased conjecture, 'cause after all, I am a Canadian. But I think what happened is that essentially that dissemination thing, I didn't finish the story because starting about the '80s, McMaster started to dominate the North American scene. Of course, I was having PhDs coming through my shops, so that we now have 10 PhDs across Canada, who can... Basically, we're all trained at McMaster, and similar things were happening in the Netherlands.

Dr. Geoff Norman (39:15):
The second school, problem-based school was not strict. They had a huge medical education research shop with 25 faculties, dating back to the '70s or '80s, some people whose names you may know, Cees van der Vleuten, Henk Schmidt. They too were high powered, PhD researchers, and they too started to disperse their students across the Netherlands and to some degree across the world, as we did. And if you look now and trace back a little bit beyond the national identity, you can really find pretty strong links back to McMaster in Australia, and of course, what's the common link? The innovation called problem-based learning. So even though I don't... I'm gonna look into this, but I don't think there's much research done on problem-based learning these days. If you're doing it, you're doing it, and if you're not doing it, you're not doing it, and it's just part of the background now, but nevertheless, I think the big impetus, the big kick in the past to get medical education research where it is, is problem-based learning, which originated in Maastricht and McMaster, and that in turn carried through to the present day where those two countries remain far and away, far and away the key players in the scene.

Dr. Geoff Norman (40:33):
Not that there aren't others, and neither Netherlands or Canada is a majority of things, but we're certainly a plurality, we're certainly number one and number two in just about any metric you can even name.

Dr. Teresa Chan (40:45):
One of the observations that I make from the outside as well, having come into the scene a little later might also be some of the funding. I mean the Netherlands is really invested in hiring scientists

of this field, and so is Canada, right? So there's a lot of centers across Canada that have dedicated medical education focus, and I think that that has to have some impact as well, right? Some of the...

Dr. Geoff Norman (41:07):
Yeah, I think you're quite right. In fact, the fiscal part is yet another part of the scenario. In the early days, we could get funding from places like the Office of Naval Research in the US, and certainly in Canada, I was funded personally, first by the Ontario Ministry of Health, they paid for my master's degree as well as for my first six years, I think, of faculty employment, and then by the National Health and Welfare, which became CIHR. Those funding sources have all dried up. Oh, the ACMC had a $100,000 a year funding they gave away, but fortunately for us, funding in Canada has still remained. Every five years or so, it mutates to one other source but up until now, knock on wood, there's always somebody ready to pick up the reins and carry on. So yes, we have opportunities for funding that frankly, our American friends don't anymore.

Dr. Geoff Norman (41:57):
The other thing that's happened that doesn't get talked about, I don't think, is the influence of the healthcare system, contrasting Canada and the US, because American healthcare is massively driven, as everybody knows, by private enterprise in the form of HMOs. Well, HMOs certainly aren't interested in generalizability theory, and so Americans have enormous difficulty in getting any interest at all in terms of research in medical education, and funding research. Furthermore, they had great difficulty finding time and commissions to do it and hiring non-clinicians because HMOs don't wanna have a PhD hanging around doing sample size calculations. So the picture is frankly more complicated than I initially painted it to be, but of course, all of this interacts. I mean, why is it so popular in Canada? Well, because it does so well in Canada. And why does it do so well? Because it's so popular.

Dr. Teresa Chan (42:54):
It's definitely one of those feed-forward cycles right? And you have successful scientists that go on to have successful proteges that go on to do great work, then the cycle continues. So it can be a really good thing, right? So definitely the founding of a field can expand just from one site an awful lot. [chuckle] So Geoff, reflecting on all of that, you've explained that the first generation were clinicians who really had some questions about how medical education should or could be done, came along, augmented by quite a few notable PhD scientists who carved out a niche in that area subsequently in that second wave, it sounds like that third wave of people are people who trained in the discipline, in the field of medical education, probably with a cross-disciplinary field of some other sort and really grounded themselves there.

Dr. Teresa Chan (43:43):
And I think that we're probably marching our way up, back to the involvement of more clinicians, I would think of myself as one of them who aimed to do medical education like from medical school. I'm probably a little precocious but I wanted to do medical education research in scholarship and innovation since I was sitting in my first week of class at my med school. And so what do you think is the future for the field when you have people that are like gunning for medical education? We can't specialize now, I had to pick a specialty that would lead to my medical education on the side, right? That's why I'm in emergency medicine.

Dr. Geoff Norman (44:17):
It's actually leading to what I was gonna say, actually, because medical education research is the ultimate team game because on the one hand, people like myself and Lorelei and Glenn and Kevin, and all those guys, on the one hand, all of us, actually except me, have a PhD in a discipline, which means that they spent something like four undergraduate years and four graduate years doing nothing but studying cognitive psychology or rhetoric or whatever. And so although the discipline typically doesn't directly apply to medical education research, it remains the foundation and the lens through which they they view the world. On the other hand, they can't begin to have the kind of depth of understanding of medicine, which is necessary in order to even at the simplest level develop materials. So they have a significant deficit in terms of the medical of the medical education part. Conversely, people like yourself with master's degrees or PhDs, however much your passion, there's a couple of realities. One is, I get to do it 40 or 50 hours a weak, you get to do it four or five hours a week, I'm sure, in your case, I'm under-exaggerating. I know you work far harder than that on the research end, but the reality is that clinicians still are basically stuck with maintaining a clinical practice, which by and large, is the majority of their waking hours.

Dr. Geoff Norman (45:44):
So it's very, very difficult for you folks to... First of all, you don't have and can't get the background, because you can't... I suppose you could do an undergraduate degree in psychology way back when, but most people tend to do... Most people going from medicine end up doing biology instead. So on the one hand, you don't have the full-time PhD, obviously full-time PhDs put in 60 hours a week, so you've always got the disciplinary, you're a little bit psychology-light or epidemiology-light or whatever. On the other hand, we lack the medical background to really be able to pursue things in depth. And so the ideal situation is a working and ongoing team relationship, and nobody knows that better than you, Theresa.

Dr. Teresa Chan (46:29):
I think that you've definitely role-modelled that throughout your career with a lot of your clinician colleagues as well, so I think it takes people on both sides to reach across and find the great questions together. It's about the great conversations, whether it's sometimes in a hotel lobby, at an insane hour, at a conference, and you just stumble upon the right question, or it could be in a board room where something just dawns on you, and you text your friend. I think it's about having those networks and having colleagues that can support you and refine and just keep kicking that question down the street a little bit more until it just refines itself. So I think it's about that community around with the question that you can build, and that's really cool to hear that that's always been a little bit of an underpinning of med ed, I think that that's what makes it such an exciting field.

Dr. Geoff Norman (47:15):
That's why I'm still doing it. Those conversations are basically a very seductive drug, a very addictive drug, and to be honest, I'm having my annual review with our joint boss, Dr. Sherbino. The first question was, "What can we do to advance your career?" and I burst out laughing, "It's over, it's done, there's nothing you can do now." But the last question was, "What can we do differently to make things... What are the significant problems?" And to me, the covid crisis just aggravated an existing situation, which is... Zoom is just not the same as being there, and the kind of juices that flow when you're in a room together, and perhaps over a beer, it just doesn't happen when you're staring at a computer too long. I'm becoming deskilled over the last year through all sorts of reasons, and one of which is because I get very little personal contact.

Dr. Teresa Chan (48:02):
I think that we have to find new ways to do it, and it'll be up to a new generation of people to think about how we continue to foster these collaborations. I've been trying to book times to just have a chat with people, like I'm doing with you and think through big ideas and hold each other... Feet to the metal, and you're right, it's not exactly the same, but it's better than not, and so...

Dr. Geoff Norman (48:22):
There's nothing... One of my speculations, as I lay awake at night, which I regularly do now, is just suppose covid had happened 20 years ago before the internet, you could be talking about students studying at home, the internet has facilitated so much of the communications to help us survive this pandemic, and without the internet, it would have been a much different scenario. You basically would have shut down the world's educational system, full stop.

Dr. Teresa Chan (48:52):
No, it's definitely a very interesting time to be living through right now, so thank you.

Dr. Geoff Norman (48:56):
Yes.

Dr. Geoff Norman (49:00):
Alright, that's great.

Dr. Geoff Norman (49:00):
Top of the field.

Dr. Teresa Chan (49:02):
Yeah, from the distant past in some ways, for medical education at least, and the origins all the way through to now, in this post-covid era of how we're gonna do business, so thank you for taking me through that short history of everything. Maybe we can book another time to have another chat. Great, thank you.

Dr. Geoff Norman (49:20):
Okay, always enjoyable. Thanks, Theresa.

[music]

Dr. Teresa Chan (49:26):

Thank you so much for tuning in to the MacPFD Spark Podcast. Just so you know, this podcast has been brought to you by the McMaster Faculty of Health Sciences and specifically the Office of Continuing Professional Development and the Program for Faculty Development. If you're interested in finding out more about what we can offer for faculty development check out our website at www.macpfd.ca that's www.M-A-C-P-F-D.ca. Many of our events are actually web events that are free. Finally, I'd like to thank our sound engineer Mr. Nick Hoskin who has been an amazing asset to our team, thanks so much Nick for all that you do. And also thank you to Scott Holmes for supplying us the music that you've been listening to. All right. So until next time this is MacPFD Spark signing off.