February 27, 2019

Quick Takes: Episode #3's Double Take

[Musical intro]

John Torous: [0:07] There's a lot of biomarkers we can gather today, and we're still learning about these and we've had them for a long time. I think what makes these digital ones different is they're usually very low cost, people have the phone to ready – a lot of times is nothing special you have to do – if your phone is collecting these passively, we call it 'passive data.' There's no engagement you have to do. So, the potential of all this data being there is exciting. But, again, we have to remember just because we have access to it, we have to prove it's valuable, we have to deal with it in an ethical way. It certainly can be invasive if it's used in the wrong way. It could be coercive if used in the wrong way as well.

David Gratzer: [0:45] What you're talking about is a sea change, right? I mean for those of us in psychiatry, I'm thinking about myself having entered med school 23 years ago, that experience of meeting with a patient and interviewing her or him, is really unchanged. Of course, we use meds differently, we have more medications, we've different types of short-term evidence-based therapies, but the actual process of intervening has a paucity of data. What you're saying is it could be very different in the near future?

John Torous: [1:14] It could be very different in the near future. In some ways you're right. We've become more sophisticated, more nuanced. But to take a historical example, in Germany in the late 1890s Emil Kraepelin, who coined the term schizophrenia or dementia praecox first (he coined eventually schizophrenia). The reason that he began to separate out what we now call bipolar from schizophrenia was he kept longitudinal note cards on his patients. And he had these longitudinal note cards and by looking at things longitudinally he started noticing two trends. Patients may present similar, but these patients that are bipolar have one course, and schizophrenia have a different course. Then from those longitudinal note cards he again defined what is today bipolar and schizophrenia. You wonder now if we have a new tool to quantify these mental illnesses. Will it help us better sub-divide illness? Better become more specific in our terminology? Will we improve our nosology as a field? So, I think that can only help everyone to have better, more accurate, more functionally based ways to understand these illnesses.

David Gratzer: [2:22] In some ways what you're talking about is introducing data the way we have in physical health. God forbid, you have trouble with your heart today and end up in our emergency

department while visiting Toronto. You would have some blood work done, you'd have an EKG, they might refer you to a cardiologist, you might have some imaging done, maybe even a stress test. By the time you saw the cardiologist there'd be a wealth of data available. The cardiologist would sit down with you, the cardiologist would still take a history, but there's data available. And right now in psychiatry there's a paucity of that.

John Torous: [2:52] Exactly. And you would still, I think sometimes say, well we have all this data, we're not going to talk to patients, we're not going to – we could discount the patient experience. I think the whole point is to say: that's not why we're doing this. We're augmenting, we're adding to, we're understanding of the context of how a person is presenting with their experience. So, it's not a kind of either/or, it's what someone feels and says versus what the data says. That it's together. It's a much richer picture that really helps us understand how people are experiencing mental illness and lets us get the right treatments that meet their needs.

David Gratzer: [3:27] So maybe we could even diagnose earlier? So somebody's sleep pattern who has bipolar affective disorder suddenly changes. What might we be able to do on the treatment end?

John Torous: [3:37] We certainly know that people spend a lot of time on screens – perhaps a topic for different day is what is the impact of screen time on mental health. There's almost a new paper every week, and you covered some of these that say good/ bad, it's almost like smoking sometimes, is any screen time bad? Diet? – but in terms of what we can do with these screens is we can really connect to people in new ways on demand. There is a lot of smartphone apps now offering different types of cognitive behavioural therapy (CBT). There's different smartphone apps offering almost every type of cognitive therapy. Someone has made a smartphone app that offers to give you on-demand skills. Some can connect you to coaches, to therapist, to clinicians, to peers. You can quickly get support. Some of these outs are good for safety netting – if you're not feeling well they can connect you to emergency services. Some can try to predict when you may be at risk of relapse and kind of give you early warning signs. Some could be as simple as just medication reminders. I think we have a whole spectrum from an alarm that pops up and says "hey it's time to take a medication or exercise," to things trying to do machine learning on your data to kind of find personal predictors of when you may be at risk.

David Gratzer: [4:48] What about severe mental illness? What are things that digital psychiatry might help us in terms of understanding illness experience?

John Torous: [4:55] Research that we're doing in our group is saying "Can we help predict relapse in early course schizophrenia?" by getting permission to look at people smartphone data in real time. And we're learning, we're still conducting the study, and we don't have any final results, but we're learning that signals that you would never thought were important could be important. For example, your phone knows when it's charged, right? The power state, the battery, it goes up. And most of us, at least I, charge my phone at night when I go to sleep and I uncharged in the morning and the battery goes down. You can imagine that perhaps days that people forget to charge their phone, they charge a different times. could that be kind of a marker, a proxy for cognition, if you're not doing as well? If your cognition is beginning to decline, do you forget to charge your phone? Do you charge it differently? So could something as simple as charging your phone pattern give us insight into when

relapse could be imminent? I said we don't know yet. We're doing research. Perhaps if I check back with you guys in 12 months, I can give you an update.

David Gratzer: [5:57] But it looks like that sort of unusual data set.

John Torous: [6:00] Yep. Right.

David Gratzer: [6:01] So I've never asked a patient in my office, "Have you had a change in your battery charging pattern recently"?

John Torous: [6:08] It's new data, there's new things we'll learn. I'm sure it'll be unexpected things. It'll be things that we think should pan out that won't.

David Gratzer: [6:15] This sounds great but what are some of the problems we're having in these early days?

John Torous: [6:19] I think like anything in early days you want to say "extraordinary claims require extraordinary evidence." I think that's a quote by Carl Sagan. And if we're saying that we're going to have these wonderful new tools to help us diagnose, understand, or treat, you want to say where is the extraordinary evidence? And I think we're seeing some very exciting pilot studies. We're seeing some very exciting feasibility studies. What we're not seeing are the studies that replicate. The studies that say it worked again in a different population with a slightly different type of patient with a slightly different twist on it. We're not seeing the same thing work twice. And the whole potential of technology is it's scalable, right? If it works in this little pilot study the reason we're excited is it can work on a population level.

David Gratzer: [7:09] You have written about 75 papers, five book chapters, you've presented nationally and internationally. What's the biggest surprise so far?

John Torous: [7:19] I think the biggest surprise is still that digital health surprises a lot of people. The fact that psychiatry, I would almost argue, is leading the way in digital health first, at least in the US. FDA approved apps are in mental health and substance abuse. I think audiences are still kind of saying: "Wait. Our field is doing this?" Mental health is actually taking the lead in this type of research. And I think perhaps now in 2019 we're beginning to see the potential in a broader way. But I think there's still a lot of catch up that we have to do of educating the public, sometimes our fellow commissions, about what we can do, and how we can do it, and to make sure we do it ethically.

[Outro]: [8:01] Quick Takes with CAMH Education is a production of the Centre for Addiction and Mental Health. You can find links to the relevant content mentioned in the show, a video version of the episode, and accessible transcripts of all the episodes we produce online at porticonetwork.ca/web/podcasts. If you like what we're doing here, please subscribe. Until next time.

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