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Quick Takes Episode #3: What all physicians need to know about digital psychiatry

[Musical intro]

David Gratzer: [00:05] I'm **David Gratzer** and welcome to Quick Takes. Today we're meeting with Dr. John Torous who is Director of Digital Psychiatry at a Harvard affiliated hospital. He's also a practicing psychiatrist. Welcome Doctor.

John Torous: [00:20] Thank you for having me here. It's a pleasure.

David Gratzer: [00:22] Let's talk about how psychiatry is changing. Let's start with a really quick question. What is digital psychiatry?

John Torous: [00:30] I think digital psychiatry is a pretty broad umbrella term, but in some ways you can break it up into two parts. One are new ways that we can quantify the lived experience of patients through mobile and digital devices like smart phone to smart watches. The second part is new ways we can push digital interventions that can increase access to care, give people access to apps or tools or support from their phones or computers or mobile devices.

David Gratzer: [00:58] What are developments you're seeing now that are particularly exciting?

John Torous: [01:02] So I think we're seeing a lot of interesting things on the phenotyping side – we'll call it the "characterizing the lived experience" side — as well as the intervention side — delivering care to people remotely. What we're seeing on the phenotyping side is, because, increasingly, people have access to smartphones – not everyone – we're able to, with people's permission, capture a lot of data about how people experience mental illness. What are their symptoms in real time? What does their sleep look like? What is their physical activity? Well, you may say "how does sleep impact physical activity? How does it impact mood?" We kind of begin to understand the functional outcomes, beyond just asking "how are you feeling?". It's "let's look at what's causing you to feel that way. Let's go one step deeper."

David Gratzer: [01:52] Let's explore that for a couple of minutes. I mean, for most of us, when we're treating a patient, we're highly dependent on what the patient tells us. Right? So the way I tell if my patient's been sleeping is I ask, "have you been sleeping?" Some of my patients might even have sleep logs. But with smartphones and wearables that could change.

John Torous: [02:12] That could change. I still too ask my patients "how are you sleeping?" "What's the quality your sleep?" But the interesting thing to say, and here's what your phone perhaps is recording your sleep automatically nothing you were doing extra, we're saying "does this make sense?" "Does this match-up of your experience?" And again, the sensors aren't always right, we all have cases where digital data looks different. But sometimes that can spark a very interesting conversation where someone says "well it looks like the phone says I'm sleeping this long, but I'm really in bed with insomnia – not able to fall asleep." Or sometimes people say "oh maybe I do actually fall asleep at 2**:**00 a.m. and not really 10**:**00 p.m. like I think I do."

David Gratzer: [02:52] So these are early days, but a couple of years ago you wrote a paper about the potential of smartphones and how much data we could gather. So, run through what we potentially could get.

John Torous: [03:05] You can imagine that with permission – the keyword – we could get G.P.S. pings and learn about people's mobility throughout the day, throughout the week. Are they spending more time at home? Are they going far? Are they going to different places? With accelerometer built into phones we learn are people running? Are they walking? Are they sedentary? Are they chasing after buses? With the microphone we can learn about tone of voice. We can learn about are we noticing that their voice is becoming perhaps more depressed from its features?

David Gratzer: [03:38] Let's talk about a few things going on and quickly tell me your thoughts as to whether or not you think this is going to change healthcare. Virtual reality?

John Torous: [03:47] Not this year, not next year, maybe in four to five years.

David Gratzer: [03:51] And how would that influence the way I treat my patients?

John Torous: [03:54] I think we're going to see that this would be very good for anxiety, for exposure therapy. It's going to become more affordable, more accessible.

David Gratzer: [04:02] E-therapies?

John Torous: [04:03] I think e-therapies can be very effective if people can get through them. We're going to learn more about what type of human support**:** is it coaches, auxiliary providers, what type of clinician support makes people actually get through e-therapy to get the benefit?

David Gratzer: [04:17] Chatbots?

John Torous: [04:18] Chatbots**:** exciting potential. If you've ever used one of them for more than a couple minutes the limitations become pretty clear. That said, tremendous advances in natural language processing are always happening in machine learning. I think we're going to hopefully see some more big pivotal studies later this year or perhaps in one to two years – but, too early to tell.

David Gratzer: [04:38] My patients, like yours, often come to my office and ask about apps. Sometimes they swear by apps they're using sometimes they ask for app recommendations. What are your thoughts?

John Torous: [04:49] So it's a question I think that if your patients aren't asking about apps they may actually be using them and are a little bit embarrassed to ask you. It's almost like when Google first came out and people didn't want to say "hey I Googled my symptoms I think I have cancer." And I think in that way I think because mental health apps are so accessible. I was in New York City recently and there were bus billboards telling me to download mental health apps. If you're on Facebook you'll get Facebook banner ads saying to download mental health apps. So people are being exposed to them, whether you realize it or not. This actually became such an issue with patients we had – and other people were having it – that we approached American Psychiatric Association. And with other psychiatrists, like Steven Chan in San Francisco, we formed a work group that does app evaluation with the American Psychiatric Association. And what we came up with is a model, if you Google "APA app evaluation model" you'll come to the page (there will be some improvements in later 2019). But we said we're going to have a four-stage model – think about a pyramid shape, if you're listening online. And we said the first thing when someone brings you an app is to say let's talk about the privacy and safety. And we put out some questions like "Is there a privacy policy? Some things to guide informed decision making?" And we said if privacy and safety make sense go on to level two. "What is the evidence?" And as we alluded to a lot of these apps may have anecdotal evidence, but no one's peer reviewed what goes on the iTunes and Android stores. A patient may find something and say that's great for depression. You look at the content and you go, oh my gosh this is just wrong. There is a case example that Jennifer Nicholas, a researcher now in Chicago at CIBTS (Center for Behavioural Intervention Technologies), found a bipolar app that told people to drink hard alcohol when they're manic. So, there are actually apps that just have dangerous content out there. There are also apps that say they are based on CBT and you look at them and you'll go, this is based on someone's opinion of something – which is fine, but that's not CBT. So, you always want to look at the evidence. And the third layer is, you want to say**:** "Is it usable?" We talked about the case where just because it's an app doesn't mean it's sticky. What is a plan that a patient's going to use it? And the fourth layer we said**:** "What is the data integration?" By that we mean you don't want to fragment care. You want to have a patient with their meds are in one app, their physical activity is in a different app, CBT is in a different app. And all that data doesn't come back to their provider, to their clinician, to say what are the big trends. So, we said we can't tell you what the best app is because apps keep changing. If you look at your phone right now it will probably want to update. Imagine if we tried to again tell you these are the top five mental health apps. By time we had that list they'd all have updated, they'd be different. So, unlike a medication where it's always going to be that, CBT is always manualize. These apps change and because the research is so new we don't have a gold standard app to compare to. I can't tell you – I can't even tell you today what is the effect size we should expect from an app for depression. Because the research, every couple of months the new paper comes out that tells us. I think it's tempting to kind of go to app repositories or these web sites and say**:** here's apps and we ranked them on our custom scoring system. But at the end of the day that's not reliable, it's not valid. You're giving your patients inaccurate information.

David Gratzer: [07:55] Do you recommend apps?

John Torous: [07:56] I do recommend apps to patients. Usually what I do is go through with them and I say let's have a discussion about it. Let's talk about what the risks and benefits are. Did it make sense for you? Let's talk about the evidence. Let's talk about usability. And let's talk about interoperability for it. There are some that I've looked at more, so I have some I like. If a patient brings a new app, we look at it together.

David Gratzer: [08:19] What are some apps you like?

John Torous: [08:20] Actually PTSD Coach, the one we talked about. The V.A., the Veterans Administration the U.S., has a very good suite of apps. Because they have privacy policies that really benefit patients. They've done a lot of evidence to show that they work. The usability they're improving – and we know it's a weakness of some of them, they may not be as engaging – but you can tell patients**:** "I need you to stick with it. You can work around that." And it's very easy to get the data off them.

David Gratzer: [08:46] So this suite includes PTSD Coach, CBT-I Coach?

John Torous: [08:49] It includes T2 Mood Tracker which can help people track symptoms. It has different, I think it has a Health box one. A lot are geared towards veterans and PTSD but there is a lot of good resources and again they cost nothing. There's no hidden costs. There's no subscriptions. I've had a lot of my patients with serious mental illness try to use some of these kind of connect to a therapist apps, only be told**:** "Well you have schizophrenia, we don't treat people like you." Which is stigmatizing, it's false advertising, and it just really leaves some patients going**:** Why can't I access the same tool that are being advertised?"

David Gratzer: [09:25] And again not to replace the psychiatrist or the therapist, but to work with. I mean is part of the problem here the difference between the agenda of Wall Street and the agenda of doctors like you and me?

John Torous: [09:35] I think that there's been a lot of interest from start-ups doing very innovative work, really pushing the boundaries of what technology can do. If you ask me what is the one thing that predicts treatment in various psychotherapies? It's the therapeutic relationship. It's not the modality of treatment. It's the relationship that we as a patient and a clinician have together. And I think a lot of times of technology now is almost trying to come in between a clinician and the patient. It's not saying, how can it bring us closer together.

David Gratzer: [10:05] Which brings us to some of the ethical considerations here like privacy.

John Torous: [10:09] Certainly in any medical intervention anything we do we always think about risks and benefits, right? We always say "What are the risks? What are the benefits? Do they make

sense in this case?" We don't want to do harm. And I think sometimes in the digital world, what does harm mean in the digital age using these digital tools? It's something that we may not cover in medical school, you may not cover in nursing school, you may not cover a different counselling programs. As a psychologist it's "what is data security and privacy mean when someone is using this app?" That's not a core topic that we cover. We started teaching it to our residents in Boston because we think it's a very important thing for a psychiatrist to be aware of as a new type of risk. But really you have to almost say, how do you help a patient understand what data they're giving up. And sometimes that means we as a field have to educate ourselves and say hey "What is this data? Where is it going? What does it mean that the data is let's say outside of Canada? What are the implications for my patient? Will their data ever be deleted?" It's complex.

David Gratzer: [11:08] How did you get interested in this field?

John Torous: [11:10] So that's a good question. My background is actually Electrical Engineering and Computer Sciences. So there's a slightly different way to approach psychiatry, to have an electrical engineer a computer scientist, and I knew that I liked programming, I liked technology. But I really wanted to work with people. I went to medical school in sunny San Diego. And I actually got interested in psychiatry by learning about ECT and watching how electricity when applied through ECT could really help people with depression have very impressive recoveries. And I said this is a kind of – compare**:** as an electrical engineer I was designing chips and looking where each electron would go. I said ECT is a kind of very early stage of harnessing the neural systems, kind of helping the brain reprogram. So, I think there's a lot of interesting ways that technology and electricity could really be used towards improving mental health. When I actually got into residency, and I was in Boston doing it, I was initially doing EEG research and using my engineering skills for signal processing – looking for differences in brain waves signals between schizophrenia and bipolar. But I was working in our emergency department, and there was a patient who had come in, he was suicidal, he was referred to me, but he really didn't want to provide any information about what was going on. Was he safe to discharge? And I said, with permission, I said**:** "Would you permit me to look at your phone so I can see if I can learn something because you don't want to communicate with me?" And he said**:** "You can do that." And looking at the text messages was very revealing.

David Gratzer: [12:49] Talking about a recent paper in American Journal of Psychiatry – this paper looking at CBT for substance – it's out of Yale. It's a big journal. And, in fact, the people who did the computerized cognitive behavioural therapy did better than the Yale psychologist.

John Torous: [13:06] There's all these exciting studies like this one again, that offer a potential of "could we scale therapy? Could we offer these programs?" And, again, some people will not do well in programs, but some people will. And could they get care when they need, where they want. Again, I'll be interesting as we replicate these studies to see how they work. But these are very, very impactful, in some ways could it could be a sea change in how we're looking at this field. That doesn't come around very often for many fields.

David Gratzer: [13:33] Dr. Torous, we've enjoyed this discussion. Let's turn it over to a minute of rapid-fire questions. We've got one minute on the clock. Here we go. Dr. Torres, digital psychiatry. Is this a game changer?

John Torous: [13:45] Yes.

David Gratzer: [13:47] What excites you the most?

John Torous: [13:48] New ways to understand lived experience of patients.

David Gratzer: [13:51] What causes you to lose sleep at night?

John Torous: [13:54] Ethical concerns used in ways to coerce people or spy on people.

David Gratzer: [13:58] What should we be doing differently?

John Torous: [14:01] Educating trainees about all these digital tools. Making sure that the new generation coming up understands that there is risks and benefits, and how to evaluate these things.

David Gratzer: [14:10] Great patient experience with digital health?

John Torous: [14:13] Patient actually who came to me and said**:** "The apps you guys make for research are great, but I've made my own, better system. And let me show you how it works." We wrote a case report and got that patient as a published author.

David Gratzer: [14:24] Jump ahead 10 years. The biggest change we'll see in practice of psychiatry?

John Torous: [14:29] We're going to see psychiatrists really learning to actually love, embrace, work with technology, partner with it. This idea of either/or is going to be gone.

[Outro]**:** [14:41] 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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