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A Look at Emerging Virtual Reality Tools in Gastroenterology

Dr. Buch:

Let's escape our busy day for a moment to imagine the future of gastroenterology and to ask ourselves: How can technology make us better clinicians? Welcome to *GI Insights* on ReachMD. I'm your host Dr. Peter Buch. And joining me to help explore that very question is Dr. Brennan Spiegel, Professor of Medicine and Public Health and Director of Health Services Research at Cedars-Sinai. Dr. Spiegel has also published over 200 articles. And if we continued with all of his accolades, we would not have time for our program. So, with that being said, Dr. Spiegel, welcome to *GI Insights*.

Dr. Spiegel:

Thanks so much for having me.

Dr. Buch:

It's truly a pleasure. So let's start with some background, Dr. Spiegel. Can you describe the purpose of the Center for Outcomes Research and Education at Cedars-Sinai?

Dr. Spiegel:

At Cedars-Sinai, for many years now, we've developed a multidisciplinary team that brings together, as the name implies, sort of people from all sorts of different backgrounds scientifically to solve complex problems, often that involve technology and with a focus on gastroenterology because I'm a GI doctor; although, as you'll hear, our research expands all of medicine. So our research team brings together social scientists, computer scientists. We have health services researchers, statisticians. And the whole idea is to figure out how do we improve the value of healthcare. And by value, I mean improving patient outcomes while doing it at the lowest cost possible, so that's what we mean by value. And what role does technology have in accelerating that movement towards value-based healthcare? So we're interested in everything from virtual reality to wearable biosensors and smartphone applications and even the role of social media as an epidemiologic sort of database for healthcare and beyond that. So that's a little overview of what we do at Cedars-Sinai.

Dr. Buch:

And with that in mind, what role do you think artificial intelligence will have for gastroenterology in the future?

Dr. Spiegel:

Yeah. So AI really has hit medicine by storm, and I think we're still trying to figure out, and will for some time, what AI really is, what are its true opportunities and maybe, of course, what are the risks of artificial intelligence. AI is a term that pertains to many different types of algorithms and statistical models. It's kind of in the end very fancy regression modeling. And there have been some really exciting recent successes. I think most GI doctors now know about polyp detection as probably the most immediate-use case of AI, where algorithms can help humans and the errors that we make in visual perception, sometimes missing subtle signs of polyps or being slightly distracted, the computer is ever-vigilant and can draw a box around what looks like a polyp. The question is, does that really help us,

and who does it help? There's some evidence from randomized trials that it can, in fact, increase adenoma detection rates.

I think the opportunities go far beyond that. I mean, any kind of visual pattern recognition, so whether it's diagnosing Barrett's esophagus, for example, without having to rely entirely on biopsies or early cancer, looking at subtle pit patterns, all of these sort of topological nuances that are evident on the surface of the bowel, AI systems might be able to outperform humans and help us really target our biopsies. But even beyond that, I think "What else can AI do?" You know, we use artificial intelligence when we're looking at social media of all things. So for example, there's a lot of really fascinating information just in the public sphere on how people are experiencing different diseases and illnesses and whether medicines work or not, so in GI we're interested in using AI to understand what people are talking about out there and actually what are the most important themes. And when you have millions and millions of posts, you can't read through all those. You actually need a computer to help you. So I'm just touching on the surface of what AI can accomplish and it's a really big and fascinating topic.

Dr. Buch:

Can you please describe your work with virtual reality?

Dr. Spiegel:

Yeah, I think when most people these days think of VR, they really think of a gaming platform for entertainment, and VR is that, but VR has been around for decades, and elite psychology labs all around the world have been studying VR for decades trying to understand what does it even mean to live in a virtual world and what are the possible benefits and harms, and so that's a big topic. But what we've learned is, more recently, now that we have these portable, accessible, relatively inexpensive, cleanable headsets is we can bring these into the clinical environment. And so the obvious use would be, let's say, you're a patient in the hospital, you're suffering from inflammatory bowel disease, have abdominal pain and just literally sitting around. What if we bring somebody to a beach? Or they can go to Hawaii? Or they could meditate? That's just the beginning of what we can do. We've been doing that for the last 5 years here at Cedars-Sinai. We've used it in over 3,000 patients. So distraction is one way to help people, and we've shown that it can actually reduce pain, and not only when they're in the headset but even after they're out of the headset. It's like the brain has been temporarily inoculated.

Dr. Buch:

I was very pleased to see your demonstration of virtual reality at the USC conference. What website can you recommend for our audience so they can actually visualize what you're talking about?

Dr. Spiegel:

Yeah. So we have a website. It's called VirtualMedicine.org. And you can go on there, and it includes a number of videos of patients using virtual reality, so you can see firsthand how the patients experience it and also what they see. And you can learn a lot more about this field that the FDA now calls Medical Extended Reality, or MXR.

Dr. Buch:

That's great. For those just tuning in, you're listening to *GI Insights* on ReachMD. I'm Dr. Peter Buch, and I'm speaking with Dr. Brennan Spiegel about technical innovations in gastroenterology.

Switching gears a bit here, Dr. Spiegel, can you tell us how social media can be harnessed to provide better care for our patients?

Dr. Spiegel:

We all know about social media now, the good, the bad, and the ugly. Right? There's no question that social media has transformed the way we communicate, it's transforming society, and there's a lot of concerns about how social media is being used, about privacy and so on and so forth, but nonetheless, it is there. And for the past about 7 years or so, we've been trying to understand how can we learn from social media. When millions and millions of people talk among each other about every topic known to man, including healthcare, medicine, and gastroenterology, there are tremendous amounts of insights that could be obtained by looking through that. And so it's all publicly available, and what we've done is come up with various ways that we can sort of anonymously learn from what

people share on social media.

And so for example, we published a paper a few years ago looking at opioid use in America and the GI side effects of opioids, and one of the really striking things that we found is people were so shocked that they developed GI consequences. A very common theme was no one ever told them, they said, that when the opioid was prescribed they might end up getting constipated or nauseous or bloated, and they wished that they had known because they may never have started. And that's the kind of thing that it's hard to learn that except for on social media. And it was a pervasive theme, and that has a very clear impact, so we need to inform people when we're starting an opioid that there could be significant, quality-of-life-stopping consequences in digestive health and GI health and beyond, of course. So that's just one example, and we've looked at lots of other uses, including in IBD and so on, using social media to help us better understand the biopsychosocial illness experiences of our patients.

Dr. Buch:

Switching topics a little bit, which biosensors hold promise for the future?

Dr. Spiegel:

Yeah. So biosensors have come a long way. There are pretty much sensors for every part of the body at this point. It's become relatively trivial to build a biosensor. The hard part is not so much the technical part, the engineering, but the hard part is what I really consider the social science of digital health. How do we incentivize people to use them? Why would they use them? How do they make sure that the data is secure and private? And ultimately, how are doctors going to take better care of their patients using remote patient monitoring with biosensors?

So of course, there's been many sensors like Fitbit and just basic activity monitors, step counts, sleep counts. I invented a sensor that was cleared by the FDA all the way back in 2015 that measures intestinal activity. It's basically a tiny microphone that sticks on your belly, and it listens to your bowel sounds. And we've, in fact, validated that it can help determine who to feed with ileus, postoperative ileus in the hospital. It can help people learn when they should time their meals so that it is in sync with their sort of circadian rhythms. But even that, which is my own, invention, I have to answer tough questions like, well, how does it really help? And how do we prove that? And where are the randomized trials that show that? And I would say we haven't done those randomized trials yet. So people can talk all they want about how these sensors are changing medicine, but I think in GI we're still trying to figure out what are the best uses of wearable sensors to manage our patients.

Dr. Buch:

It's still very exciting. And before we conclude, Dr. Spiegel, are there any other insights you'd like to share with our audience today?

Dr. Spiegel:

Yeah. I think that in general, what we're seeing is a superconvergence between digital technologies and clinical medicine, and it's not just a conversion, so it's a superconversion. That means the intersection points are multiple, and so I think when you talk about something like AI or VR, depending upon your point of view, you might think of that as kind of ridiculous or you may be cynical about it. You know, "The computer is trying to take my job." "Are gaming platforms really as good as a medicine?" I don't think that's the right attitude. This is real stuff, and it's our responsibility as clinicians and scientists and academics to try and responsibly figure out how do we incorporate all of these technologies with the art and practice of medicine. We're not taking humans out of anything. We still and always will need human doctors to look human patients in the eyes, to make those empathic connections, to understand the biopsychosocial illness experience, but we need to be open enough to recognize that technologies like AI, platforms like social media, wearable biosensors, VR, can augment our ability to take care of patients. So I think that's sort of in closing how I think of where we are right now and the opportunity ahead of us in medicine.

Dr. Buch:

Well, this was certainly a thought-provoking look into the future. And I want to thank my guest, Dr. Brennan Spiegel, for an excellent discussion on technical innovations in gastroenterology. Dr. Spiegel, it was truly a pleasure having you on the program.

Dr. Spiegel:

Thank you very much.

Dr. Buch:

For ReachMD, I'm Dr. Peter Buch. To access this and other episodes in this series, visit ReachMD.com/GIInsights, where you can Be Part of the Knowledge. Thanks for listening and see you next time.