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Key Considerations for CGM Use in Older Adults with T1D

Dr. Buse:
Welcome to *Diabetes Discourse* on ReachMD. I'm Dr. John Buse. And joining me to discuss her paper that focused on characterizing the determinants and dynamics of continuous glucose monitoring in older adults with type 1 diabetes is Dr. Anna Kahkoska. Dr. Kahkoska is an Assistant Professor in the Department of Nutrition and an Adjunct Assistant Professor in the Division of Endocrinology and Metabolism at the University of North Carolina at Chapel Hill.

Anna, thanks for speaking with me today.

Dr. Kahkoska:
Thanks, John. Really excited to be here.

Dr. Buse:
I really love your paper and particularly the title, which was "Nothing is linear: Characterizing the determinants and dynamics of CGM use in older adults with type 1 diabetes." Tell us a bit about how you came to this niche of study.

Dr. Kahkoska:
Sure. So we started planning for the study in the fall of 2020, and it was really motivated by wanting to understand better how older adults with type 1 diabetes interact with the technology that's become so central to type 1 diabetes management. So from the population-level perspective, there's a growing number of older adults, which we define as 65 years and older, who are living with diabetes, and what's compelling to me as a researcher is that we have so many existing studies that have shown that continuous glucose monitoring, or CGM, can improve diabetes management for older adults.

I think it's worth noting that because CGM reduces the risk of hypoglycemia, it can offer real safety benefits in this subpopulation of individuals with diabetes who both carry the greatest risk for such episodes and for whom the consequences can be devastating. And based on all that evidence, CGM is now explicitly recommended as standard of care for older adults with type 1 diabetes. Despite that, we know that adoption of CGM by older adults with type 1 diabetes is lower, particularly when you compare that to the younger adult counterparts. So by 2020, early 2021, a handful of studies or narrative reviews had outlined what the age-specific barriers to CGM might be that explain these trends, but my collaborators and mentors and I noticed that there were a few studies that really dove deeper into the experiences that older adults may have as they learn how to use CGM and then incorporate that new technology into their long-term diabetes self-management regimen.

Dr. Buse:
That's really cool. I mean, as a clinician, I see a ton of people with type 1 diabetes; 30 years ago, very few were over the age of 65. Now most of my practice is over the age of 65. So what methods did you use in your study?

Dr. Kahkoska:
So our goal was to characterize the factors that promote effective use of CGM over time in older adults with type 1 diabetes and in as much depth as possible, and this is because we want to know who needs what and in what combination so that they're able to really use this technology effectively. This was a qualitative study, but we used systems science methods, and that's because we knew we were trying to capture something that's really complex, and by that I mean that older adults' experiences using CGM can't really be explained by simple cause and effect relationships. These patterns of effective or less-effective use are shaped by what looks more like a web of multiple factors interacting, and that's really reminiscent of a complex system. We define systems as exactly that, webs of interconnected components that interact with each other to produce emergent effects distinct from changes that might come from

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targeting individual factors. So with that frame, we gain access to a way of thinking called "systems thinking" and tools from systems science, which is basically what we need to more wholistically investigate the structure and behavior of complex systems.

So I worked with my mentor, Dr. Kristen Hassmiller Lich, who is an Associate Professor in Health Policy and Management at UNC, and we adapted this participatory approach to system dynamics modeling called "group model building." And in a series of workshops, we worked with 33 older adult study participants, and they exchanged their perceptions about CGM, the experiences they've had, if they were using CGM, and then they worked together to brainstorm about the key factors that underlie these different distinct trajectories of CGM use.

So the data we present in the manuscript is in the form of what's called a causal loop diagram, which is a qualitative model of the system of factors that we think work together to shape effective patterns of technology use in older adults with diabetes. And this diagram, it's like a map. It really helps us think about where we have real power to support change or what can undermine success when that happens and how do we guard against that, for example.

Dr. Buse:
So this is an enormous paper with lots of figures. I really recommend to our listeners that they look up the paper and take a close examination of those issues if they are particularly interested. But could you try and summarize the topline results for us?

Dr. Kahkoska:
I really appreciate you saying that because I just want to underscore that in my mind, what the study contributes really is the model itself, which encodes so much information about the barriers and facilitators to effective CGM use and how they change over time. For us, one of the most important things that we learned happened when we looked at how all of these factors and feedback loops play out over time. So we heard and we documented stories about what's happening all across the trajectory of someone learning to use CGM, from those first few days into months and years of use. And together, that longitudinal view has allowed us to develop a conceptual model for the distinct stages of the process by which an older adult with diabetes comes to fully integrate CGM into their self-management. So we've actually identified five distinct stages of integration where older adults have really distinctly different needs for support with technical aspects, for example, with learning how to use data from CGM and then later in the trajectory, support for adjusting through lifestyle.

Dr. Buse:
For those just tuning in, you're listening to *Diabetes Discourse* on ReachMD. I'm Dr. John Buse, and today I'm speaking with Dr. Anna Kahkoska about continuous glucose monitoring in older adults with type 1 diabetes.

Coming back to our discussion, Anna, I do think that for people with a real interest in patient engagement and management the paper is worth a full read, but can you give us what the topline messages are for practicing clinicians as they're thinking about prescribing or working with patients with type 1 diabetes who are using CGM?

Dr. Kahkoska:
Yeah, absolutely. I think that even though we might think about CGM as a wearable that you just sort of slap on and can go on your way, we learned from the older adults in our studies who have had these experiences that integrating diabetes technology is actually a really complex learning process, and there are a lot of different emotions that are involved. And I think that particularly when we're thinking about older adults, we have to remember that we're asking people who have decades of self-management experience and have really gotten to where they are because they have a system in place that works, that they have to disown that system and make a bunch of investments, like time and learning something new, taking these risks and even economic investments or financial investments, and all of those investments have to happen before somebody really realizes the value of CGM.

Dr. Buse:
Would you care to speculate about what we should do with regards to the new availability through Medicare for CGM in all patients with type 2 diabetes treated with insulin or with "problematic hypoglycemia"?

Dr. Kahkoska:
Sure. So the first thing to do is to understand this population, and that would just be because we anticipate we'll be wanting to support them in the future through our science, so our team has already actually started on this. We have conducted an extension study of that initial system model as well as a conceptual model for CGM integration with a more diverse sample that's meant to really capture the experiences had by all ambulatory older adults with type 1 and type 2 diabetes. And even in that work so far, we really have started to hear some new stories, and we're understanding new ways that we can support what is ultimately just a broader and much more heterogeneous population of older adults with diabetes.

Dr. Buse:

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Great, so more to come. Before we close, is there anything else that you'd like to leave the audience with?

Dr. Kahkoska:
Yeah. I think that longitudinal view of CGM integration really shows us that rather than thinking about barriers and facilitators to effective CGM use in older adults all at once, we really need to be thinking about them as longitudinal and dynamic, so that means checking back in, understanding what challenges might have emerged, and where there might be new opportunities to provide support for older adults; and that support can be technical; it could be clinical; it could actually just be emotional support.

Dr. Buse:
Fantastic. This has been a really impactful conversation, and I'd like to thank my guest, Dr. Anna Kahkoska, for being here and sharing her insights on continuous glucose monitoring in older adults with type 1 diabetes. Anna, thanks so much for joining us.

Dr. Kahkoska:
Thank you, John. It was a pleasure.

Dr. Buse:
For ReachMD, I'm Dr. John Buse. To access this episode and others from our series, visit ReachMD.com/DiabetesDiscourse, where you can Be Part of the Knowledge. Thanks for listening.

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