

# The use of CGMs in redefining care delivery for type 2 diabetes

Diabetes is one of the leading drivers of lost productivity, healthcare costs, and death in the U.S. Novel technology-enabled healthcare delivery models show great promise in their ability to combat these devastating effects. This paper will cover:

- Status quo glucose monitoring
- Benefits of intermittent continuous glucose monitoring (CGM) use
- Emergence of a comprehensive virtual diabetes care model to support value-based care

# Overview

Approximately 34 million people in the U.S. are living with diabetes,<sup>1</sup> a condition characterized by chronic high blood glucose levels that impacts personal health, healthcare costs, and productivity. Between 90 and 95 percent of those living with diabetes have type 2 diabetes, in which the body does not use insulin well and cannot keep blood sugars within normal range.<sup>1</sup> In the U.S. in 2017, diabetes was the seventh leading cause of death<sup>1</sup> and cost \$237 billion in direct medical costs.<sup>2</sup> In addition to these direct medical expenses, reduced worker productivity and increased absenteeism cost the country an additional \$90 billion.<sup>2</sup> This places a unique strain on employers since the prevalence of diabetes among full-time workers is more than 6 percent.<sup>3</sup>

Diabetes care in the U.S. today is suboptimal. This is due, in large part, to a shortage of endocrinologists and diabetologists.<sup>4</sup> It has been estimated that 90 percent of people living with diabetes are treated by primary care physicians (PCPs), not specialists,<sup>5</sup> within a fractured care model that lacks coordination and continuity.

With limited access to high-quality healthcare, people living with type 2 diabetes are at risk of poor health outcomes and complications such as heart disease, stroke, nerve and kidney disease, and vision loss.<sup>1</sup> The negative impact diabetes commonly has on quality of life, known as diabetes distress, is also devastating.

Technology-enabled virtual care models can provide access to specialty care in areas with limited physician resources and allow people to better manage their own health at home, potentially resulting in improved outcomes and lower costs. Among the newer technologies available to the diabetes community, continuous glucose monitoring (CGM) systems have shown promise in helping people living with type 2 diabetes manage their glucose levels.<sup>6</sup>

## Meet Terry, age 60

Living with type 2 diabetes since 2012

Onduo member since April 2018



After 17 months with Onduo, Terry lost 32 lbs. and reduced his A1C by 2.9 percent, down to 6.5 percent.

“When I was told that I had [type 2] diabetes and not just prediabetes, I was in denial. I had little support from my primary care physician and I felt overwhelmed. I’ve been struggling with time and consistency to make changes. With the help of the Onduo program—with my CGM, the educational materials, and the coaching support (i.e., someone watching over my back)—I have come to understand and accept my condition. I now feel I am prepared to better manage my diet and activities.”

# A New Era of Glucose Monitoring

Chronically elevated blood sugar can result in damage to organs such as the heart, eyes, and kidneys. Managing blood sugar is therefore critical for the 34 million people in the U.S. who live with diabetes.<sup>1</sup> Yet, for most, glucose monitoring is often cumbersome, time-consuming, and painful. Using a blood glucose meter (BGM) involves pricking a finger or other body part with a needle, collecting blood drops on a test strip, and inserting the strip into a device that quantifies the concentration of glucose in the blood.

CGMs, on the other hand, monitor glucose levels continually throughout the day and are therefore the emerging standard of care. Most real-time CGMs are small, wearable devices made up of a tiny sensor that sits just below the skin, providing a painless method for continually measuring glucose. The sensor is attached to a patch that adheres to the skin and can stay in place through all normal daily activities. Finger pricks are not required when one is using a CGM.<sup>a</sup> The device sends glucose data to a smartphone app or dedicated receiver that stores and tracks the information.

Whether used all the time or just once in a while ("intermittently"), CGMs provide rich information on an individual's "time-in-range" (the percentage of time that they spend in the ideal glucose range of 70-180 mg/dL).<sup>9</sup> CGMs offer users a better understanding of how their food and lifestyle decisions impact their glucose levels, as well as how to make adjustments to spend more time-in-range.<sup>10</sup> The rich glucose information provided by CGMs also allows healthcare providers to perform periodic assessments and adjust therapy as needed.

CGMs are prescription-only devices in today's regulatory environment, meaning a licensed clinician must prescribe them to people with diabetes.

<sup>a</sup> If glucose readings do not match symptoms or expectations, users are instructed to use a blood glucose meter to make diabetes treatment decisions.

1-5 Daily Readings

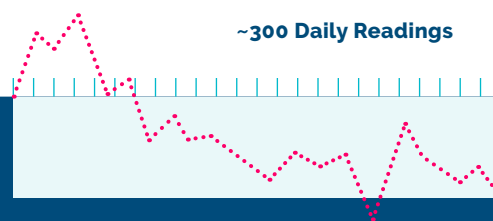
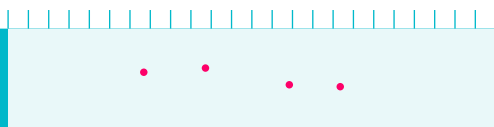
## BGMs

- require painful finger pricks, which can lead to avoidance
- provide around four readings per day for people with type 2 on insulin, and far fewer for those not on insulin<sup>7,8</sup>
- provide a snapshot of glucose levels, not enough to see highs and lows throughout the day

~300 Daily Readings

## CGMs

- provide automatic readings
- provide readings every 5 minutes amounting to 288 glucose readings per day
- provide insights into trends over time for more precise diabetes management



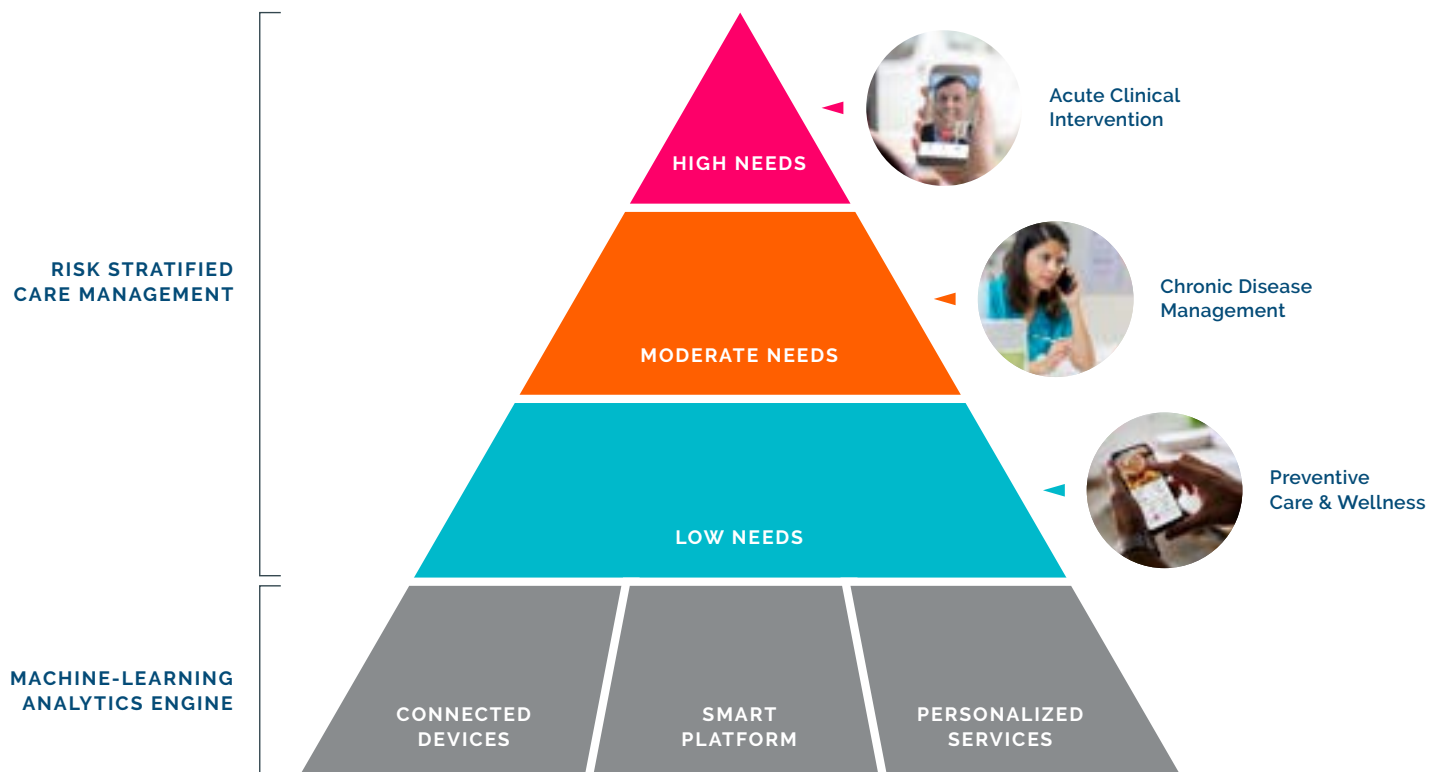
# Onduo's CGM-Supported Virtual Care Model

In 2018, Onduo launched its smartphone-based virtual care program to supplement members' brick-and-mortar primary care visits. The program is convenient for members, who can continually access support services such as: remote lifestyle coaching from certified diabetes care and education specialists (CDCESs) and health coaches, connected tools and devices, and clinical support from board-certified endocrinologists via a virtual clinic.

Onduo's endocrinologists are licensed to provide care and prescribe in 49 states and Washington, D.C., and the organization can fulfill durable medical equipment orders, allowing shipment of CGMs directly to members. This is distinct from other remote diabetes management programs and brick-and-mortar practices.

In fact, only one third of brick-and-mortar PCPs said that they currently prescribe CGMs in a recent survey, and those who do cannot deliver the devices to the patient's doorstep.<sup>11</sup> Onduo's remote prescription and provision of CGMs are unique supports for people living with type 2 diabetes.

Furthermore, the Onduo model ensures that, for those using it, CGM is part of a supportive care journey. Various diabetes management strategies are paired with CGMs to capture data related to behavior change, daily activities, and medication effectiveness. Onduo's machine-learning analytics engine can then drive personalization for enrollment, engagement, risk prediction, and precision care to optimize outcomes.



# Getting to Sustainable Outcomes and Value-Based Care

Employers and payers have a vested interest in keeping their populations as healthy as possible. Since diabetes is a major driver of poor health, that means identifying those at high risk of diabetes or its complications and intervening to prevent poor health outcomes. Even if high-risk individuals are identified, helping them manage their condition can be difficult.

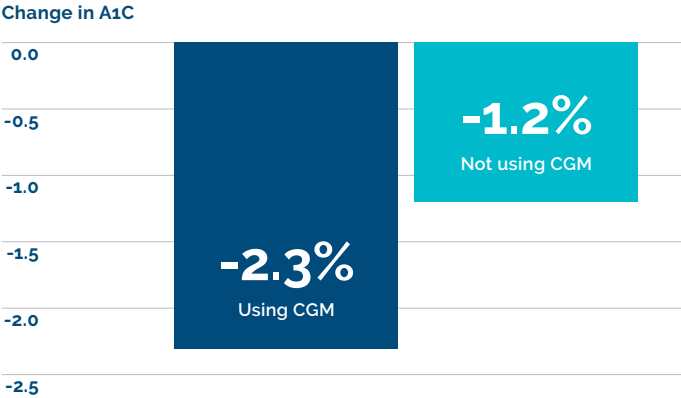
CGM use has proven effective in people with type 2 diabetes, both on and not on mealtime insulin.<sup>7,8,12</sup> It is likely that most people living with diabetes can benefit from the use of a CGM, especially as a teaching tool for self-management to understand how specific foods and activities impact their health.<sup>6</sup>

Onduo has taken this revolutionary technology a step further by embedding CGM within a virtual care model. In this way, CGM both supports members' self-management and informs continuous, remote support and care regimens. Early evidence is encouraging:

- In a real-world study, recently published in *The Journal of Diabetes Science and Technology*, participants in the Onduo program saw significant improvement in glycemic control.<sup>13</sup> The article presents data on 740 Onduo members located in 21 states in the U.S. The program was most effective for members at high risk of diabetes-related complications, for whom average A1C dropped by 2.3 percent.

Baseline A1C (%)	Average A1C decrease (%)	% of people who improved
>9%	2.3%	92%
8-9%	0.7%	77%
7-8%	0.2%	64%

- Further real-world evidence (n=612) showed that Onduo's program drives marked A1C reductions across the board, but CGM significantly augments the effectiveness of the program.<sup>14</sup> Among participants with an A1C > 8.0 percent at baseline, the group who used CGM saw a nearly two-fold greater average decrease in A1C (-2.3 percent) compared to the group who did not use CGM (-1.2 percent).



- A study published in *Clinical Diabetes*, a journal of the American Diabetes Association, showed that diabetes distress levels fell significantly among 228 participants in Onduo's program.<sup>15</sup> Diabetes distress is a common barrier to treatment adherence and optimal self-management, so addressing it is critical for promoting positive health outcomes. Notably, those participants who were prescribed CGM through Onduo's program saw significantly greater reductions in distress.



Less  
Regimen-Related  
Distress



Less  
Physician-Related  
Distress



Less  
Emotional  
Burden



Less  
Interpersonal  
Distress

- In a prospective four-month, single-arm study, CGM-measured time-in-range increased from 65 percent to 76 percent (+2.4 hours per day) among 43 participants.<sup>16</sup> This increase [1] is considered clinically significant and [2] increased the participant average time-in-range to above the ADA's target of 70 percent.<sup>10</sup> A1C, weight, blood pressure, and cholesterol also decreased significantly among participants in this study.



After 4 months,  
Onduo participants  
spent an additional

**2.4**

hours per day in target  
glucose range

- In a survey study, 594 Onduo members expressed very high overall satisfaction with their CGM experience, that they learned a lot about their diabetes from wearing the device, and that it improved their self-management.<sup>17</sup> Of those surveyed, 88 percent said they would like to use a CGM again.

**88%**

Percentage of Onduo  
members who would  
like to use CGM again.



# Conclusion

Onduo's virtual care model offers a marriage of an advanced technology, CGM, and a multidisciplinary, continuous virtual care model. The result is a whole-person approach that supports people at various stages in their journey to better health. When people are empowered and given the tools to take control of their health, quality of life, medical conditions, and healthcare costs all improve. With Onduo's modern and scalable care delivery model, we can improve the lives of countless people living with diabetes together.

**To learn more, visit us [here](#),  
or email [partners@onduo.com](mailto:partners@onduo.com).**

# References

- 1 Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2020*. Retrieved 1/8/2020 from <https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf>.
- 2 Yang W, et al. Economic costs of diabetes in the U.S. in 2017. *Diabetes Care*. 2018.
- 3 Gallup-Sharecare Well-being Index. The Cost of Diabetes in the U.S.: Economic and Well-Being Impact. 2017.
- 4 Johnston KJ, et al. Lack Of Access To Specialists Associated With Mortality And Preventable Hospitalizations Of Rural Medicare Beneficiaries. *Health Affairs*. 2019.
- 5 Davidson JA. The increasing role of primary care physicians in caring for patients with type 2 diabetes mellitus. *Mayo Clinic Proceedings*. 2010.
- 6 Kompala, T et al. A New Era: Increasing Continuous Glucose Monitoring Use in Type 2 Diabetes. *AJMC Evidence-Based Diabetes Management*. 2019.
- 7 Haak T, et al. Flash Glucose-Sensing Technology as a Replacement for Blood Glucose Monitoring for the Management of Insulin-Treated Type 2 Diabetes: a Multicenter, Open-Label Randomized Controlled Trial. *Diabetes Therapy*. 2017.
- 8 Beck RW, et al. Continuous Glucose Monitoring Versus Usual Care in Patients With Type 2 Diabetes Receiving Multiple Daily Insulin Injections: A Randomized Trial. *Annals of Internal Medicine*. 2017.
- 9 diaTribe. (2019). *Time-In-Range*. Retrieved 1/8/2020 from <https://diatribe.org/time-range>.
- 10 Battelino T, et al. Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range. *Diabetes Care*. 2019.
- 11 Levine BJ, et al. The Case for Targeted Diabetes Medication and Device CME for PCPs. *Diabetes*. 2020.
- 12 Vigersky RA, et al. Short- and long-term effects of real-time continuous glucose monitoring in patients with type 2 diabetes. *Diabetes Care*. 2012.
- 13 Dixon RF, et al. A Virtual Type 2 Diabetes Clinic Using Continuous Glucose Monitoring and Endocrinology Visits. *Journal of Diabetes Science and Technology*. 2019.
- 14 Layne JE, et al. Change in A1C With and Without Intermittent Use of CGM In Adults With Type 2 Diabetes Participating in the Onduo Virtual Diabetes Clinic. *Diabetes*. 2020.
- 15 Polonsky WH, et al. The Impact of Participation in a Virtual Diabetes Clinic on Diabetes-Related Distress in Individuals with Type 2 Diabetes. *Clinical Diabetes*, ePub June 12, 2020.
- 16 Majithia AR, et al. Improved A1c and TIR in Adults With T2D Participating in a CGM Driven Virtual Diabetes Clinic. *Diabetes*. 2020.
- 17 Zisser H, et al. Remote Application and Use of Continuous Glucose Monitoring by Adults with Type 2 Diabetes in a Virtual Diabetes Clinic. *Diabetes Technology & Therapeutics*. 2020.