



Leveraging Innovative Technology in Diabetes Management

Harnessing Advances in Glucose
Monitoring to Achieve Better Outcomes

David Hines, Executive Director of Benefits
Metro Nashville Public Schools



Challenges of Diabetes



Diabetes Prevalence Causes Substantial Health and Economic Burden^{1,5}

In the United States, **over 38 million** people have diabetes^{2,3}



The main types of diabetes are:

Type 1 diabetes, affecting
~2 million people²



Type 2 diabetes, affecting
~36 million people²⁻⁴



In addition, **1 in 3** Americans:

- Have prediabetes^{2,3}
- Will develop diabetes sometime in their lifetime⁶

Diabetes is the most expensive chronic condition in the US:



\$ 1 out of **\$ 4**

of US healthcare costs is spent on caring for people with diabetes^{5,6}

Diabetes also costs **over \$100 billion** in lost productivity per year^{*,5-7}

*Value adjusted for inflation in medical care cost from 2017 to 2024 based on database from the US Bureau of Labor Statistics.

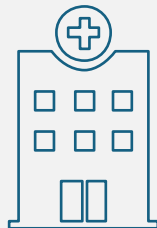
References: 1. Koyama AK, et al. Trends in lifetime risk and years of potential life lost from diabetes in the United States, 1997–2018. *PLoS One*. 2022;17(5):e0268805. 2. American Diabetes Association. Statistics About Diabetes. Accessed June 26, 2024. <https://diabetes.org/about-us/statistics/about-diabetes>. 3. Centers for Disease Control and Prevention. National Diabetes Statistics Report. Accessed June 28, 2024. <https://www.cdc.gov/diabetes/php/data-research/>. 4. Centers for Disease Control and Prevention. About Type 2 Diabetes. Accessed June 26, 2024. <https://www.cdc.gov/diabetes/about/about-type-2-diabetes.html>. 5. American Diabetes Association. *Diabetes Care*. 2018;41(5):917-928. 6. Centers for Disease Control and Prevention. Health and Economic Benefits of Diabetes Interventions. Accessed June 28, 2024. <https://www.cdc.gov/nccdphp/priorities/diabetes-interventions.html>. 7. Federal Reserve Bank of Saint Louis. Research Consumer Price Index: Medical Care. Accessed June 28, 2024. <https://fred.stlouisfed.org/series/CPIEMEDCARE>.

Poorly Controlled Diabetes Can Lead to a Broad Range of Serious Complications^{1,2}



ED Visits

~17 million visits reported with diabetes as a listed diagnosis^{*,1}



Hospitalizations

~8 million hospitalizations reported with diabetes as a listed diagnosis¹

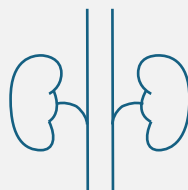


Cardiovascular Complications

Adults with diabetes are **2x** as likely to have heart disease or a stroke as those who do not have diabetes²

Kidney Disease

Diabetes is the **leading cause of end-stage kidney disease**¹



Vision Disability

Diabetes is the **leading cause of new cases of blindness** in adults¹



Gestational Diabetes

~50% of women who develop diabetes in pregnancy go on to develop type 2 diabetes³



Effective blood glucose management can reduce the risk of eye disease, kidney disease, and nerve disease by 40%⁴

*ED = emergency department.

References: 1. Centers for Disease Control and Prevention. National Diabetes Statistics Report. Accessed June 28, 2024. <https://www.cdc.gov/diabetes/php/data-research/>. 2. Centers for Disease Control and Prevention. Your Heart and Diabetes. Accessed July 12, 2024. <https://www.cdc.gov/diabetes/diabetes-complications/diabetes-and-your-heart.html>. 3. Centers for Disease Control and Prevention. About Gestational Diabetes. Accessed June 28, 2024. <https://www.cdc.gov/diabetes/about/gestational-diabetes.html>. 4. Centers for Disease Control and Prevention. Health and Economic Benefits of Diabetes Interventions. Accessed June 28, 2024. <https://www.cdc.gov/nccdphp/priorities/diabetes-interventions.html>.

Managing Glucose Levels Is an Ongoing Challenge: Nearly Half of U.S. Adults With Diabetes Are Not at the A1C Goal of <7%¹

42

Factors That Affect Blood Glucose²

“If you really look at it, having diabetes means you have an additional job to attend to every day.”³

Aus Alzaid, MD. *Diabetes Technol Ther.* 2014;16(8):542-544.

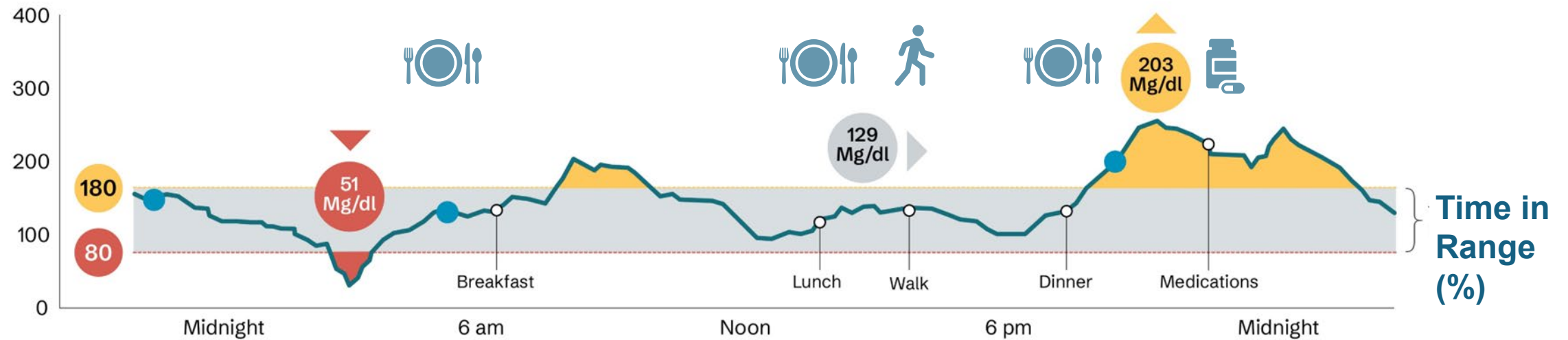
Food
1. Carbohydrate quantity
2. Carbohydrate type
3. Fat
4. Protein
5. Caffeine
6. Alcohol
7. Meal timing
8. Dehydration
9. Personal microbiome
Medication
10. Medication dose
11. Medication timing
12. Medication interactions
13. Steroid administration
14. Niacin (Vitamin B3)

Biological
15. Insufficient sleep
16. Stress and illness
17. Recent hypoglycemia
18. During-sleep blood sugars
19. Dawn phenomenon
20. Infusion set issues
21. Scar tissue and lipodystrophy
22. Intramuscular insulin delivery
23. Allergies
24. A higher glucose level
25. Periods (menstruation)
26. Puberty
27. Celiac disease
28. Smoking

Activity
29. Light exercise
30. High-intensity and moderate exercise
31. Level of fitness/training
32. Time of day
33. Food and insulin timing
Environmental
34. Expired insulin
35. Inaccurate blood glucose reading
36. Outside temperature
37. Sunburn
38. Altitude
Behavioral & Decision-making
39. Frequency of glucose checks
40. Default options and choices
41. Decision-making biases
42. Family relationships and social pressures

References: 1. The CDC estimates that 47.4% of U.S. adults with diagnosed diabetes had an A1C value of 7.0% or higher. Centers for Disease Control and Prevention. National Diabetes Statistics Report. Accessed July 12, 2024. <https://www.cdc.gov/diabetes/php/data-research/index.html>. 2. Brown A. Poster Now Available: 42 Factors That Affect Blood Glucose. Accessed June 28, 2024. <https://diatribe.org/diabetes-management/poster-now-available-42-factors-affect-blood-glucose>. 3. Alzaid A. There is a missing ingredient in diabetes care today. *Diabetes Technol Ther.* 2014 Aug;16(8):542-544.

Glucose Levels Are Constantly Changing—Making It Challenging for Patients to Stay in Their Target Range¹



Increased Time In Range (TIR) correlates with improved A1C and lower risk of long-term complications²

References: 1. Dexcom T2D pilot study. Similar observations using Dexcom CGM have been published in: Vigersky RA, et al. Short- and long-term effects of real-time continuous glucose monitoring in patients with type 2 diabetes. *Diabetes Care*. 2012 Jan;35(1):32-38; Ehrhardt NM, et al. The effect of real-time continuous glucose monitoring on glycemic control in patients with type 2 diabetes mellitus. *J Diabetes Sci Technol*. 2011 May;5(3):668-75; Cox DJ, et al. Continuous glucose monitoring in the self-management of type 2 diabetes. *Diabetes Care*. 2016 May;39(5):71-73. 2. Aleppo G. Clinical application of time in range and other metrics. *Diabetes Spectr*. 2021 May;34(2):109-118.



Diabetes Management at Metro Nashville Public Schools





METRO
NASHVILLE
PUBLIC
SCHOOLS



41st largest district
(88,000 students)

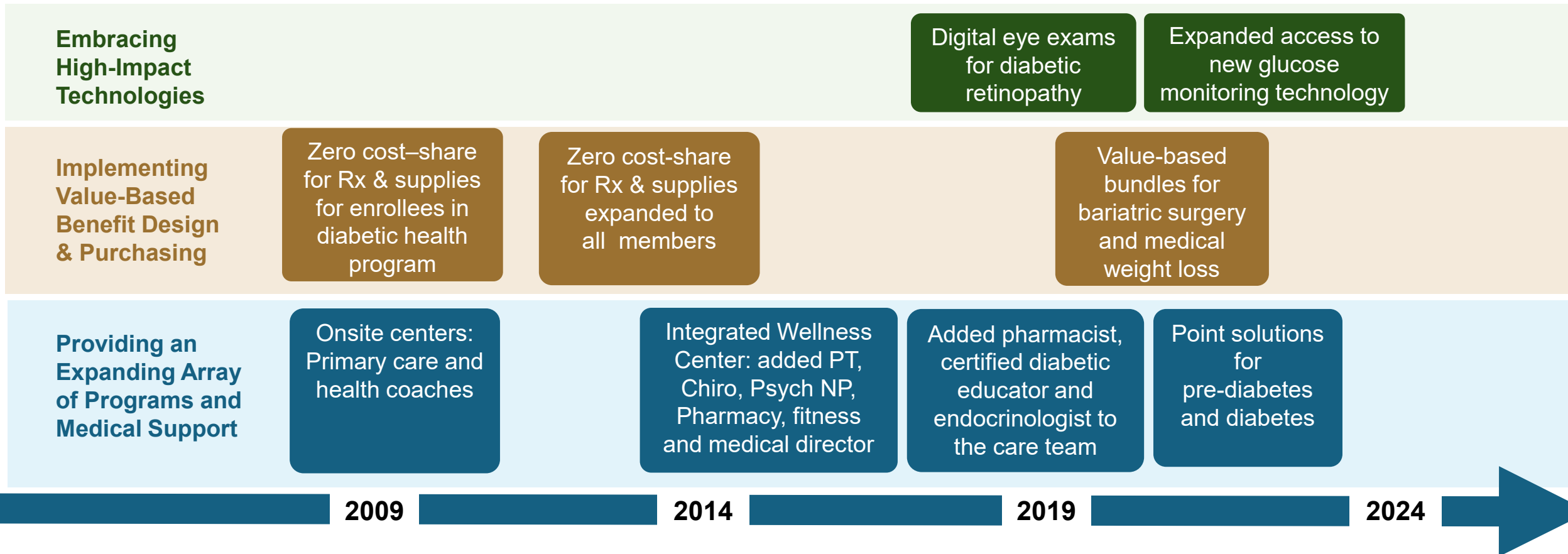
Teacher's health plan
(9,200 active and retired teachers)

Support staff covered by Metro Nashville
Government
(4,000 active employees)

*With a core belief that healthy employees are
better employees*

Over the Past 15 Years, MNPS Has Established Many Layers of Support for Members with Diabetes

Key Milestones of the MNPS Diabetes Strategy





Harnessing Advances in Glucose Monitoring



Continuous Glucose Monitoring (CGM) Provides a Step-Change Advance Over Conventional Measurement Devices



Conventional blood glucose measurement

- **Via painful, inconvenient fingersticks**
- Impractical, user error-prone, and not very discreet
- **Only snapshots** and no trends



Continuous glucose monitoring

- ✓ **Continuous, automatic** measurement via sensor
- ✓ **No painful fingersticks*** required for treatment decisions
- ✓ **Automatic transmission** of the glucose value to display device (phone or receiver)

*If your glucose alerts and readings from a CGM do not match symptoms or expectations, use a blood glucose meter to make diabetes treatment decisions.

Common Features of CGM Systems Enable More Effective Glucose Management



Discreet, easy-to-use wearable device that simplifies the patient experience

Works through a tiny sensor inserted under the skin (in abdomen or arm)

Transmits information wirelessly to a phone or monitor as often as every 5 minutes, 24/7 to support decision-making in real time

Source: Dexcom G7 User Guide, 2024.

Translates readings into easy-to-follow data and insights that promote healthier eating patterns and simplified diabetes management routines

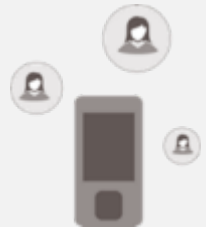


Automatic reporting and documentation of the glucose values to enable tracking and analysis of trends over time



Alerts that can prompt immediate action to help prevent periods of extremely high or extremely low blood glucose levels

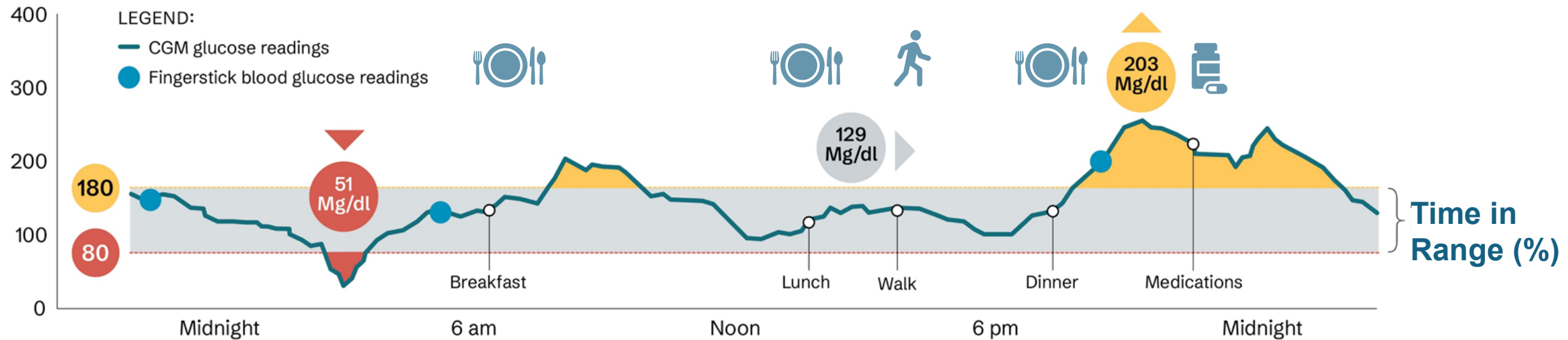
Ability to allow friends and family to view glucose information and provide support to the patient



Ability to share data with smart watches, insulin pumps and digital health apps to further enhance glucose management



CGM Readings, Trend Information, Alarms and Other Feedback Help Patients Adjust Their Behaviors to Improve Time In Range¹



References: 1. Dexcom T2D pilot study. Similar observations using Dexcom CGM have been published in: Vigersky RA, et al. Short- and long-term effects of real-time continuous glucose monitoring in patients with type 2 diabetes. *Diabetes Care*. 2012 Jan;35(1):32-38; Ehrhardt NM, et al. The effect of real-time continuous glucose monitoring on glycemic control in patients with type 2 diabetes mellitus. *J Diabetes Sci Technol*. 2011 May;5(3):668-75; Cox DJ, et al. Continuous glucose monitoring in the self-management of type 2 diabetes. *Diabetes Care*. 2016 May;39(5):71-73.

MNPS and Other Employers Have Identified Several Advantages of CGMs¹



Better health outcomes including improved TIR and A1C levels²

No fingersticks can mean no need to step away from work to check glucose levels*

Increased patient engagement in diabetes management³

Better glucose control,^{4,5} which can be helpful for workers in **safety-sensitive positions**

Healthcare cost savings through reduced ED visits and hospitalizations⁶

*If your glucose alerts and readings from a CGM do not match symptoms or expectations, use a blood glucose meter to make diabetes treatment decisions.

References: 1. Comments of employee health benefits decision-makers at large employers that attended Employer Advisory Board meetings hosted by Gallagher Employer Research & Insights, May 11, 17 and 23, 2023. 2. Karter AJ, et al. Association of real-time continuous glucose monitoring with glycemic control and acute metabolic events among patients with insulin-treated diabetes. *JAMA*. 2021 Jun 8;325(22):2273-2284. 3. Miller EM. Using continuous glucose monitoring in clinical practice. *Clin Diabetes*. 2020 Dec;38(5):429-438. 4. Visser MM, et al. Comparing real-time and intermittently scanned continuous glucose monitoring in adults with type 1 diabetes (ALERTT1): a 6-month, prospective, multicentre, randomised controlled trial. *Lancet*. 2021 Jun 12;397(10291):2275-2283. 5. Visser MM, et al. Effect of switching from intermittently scanned to real-time continuous glucose monitoring in adults with type 1 diabetes: 24-month results from the randomised ALERTT1 trial. *Lancet Diabetes Endocr*. 2023 Feb;11(2):96-108. 6. Isaacson B, et al. Demonstrating the clinical impact of continuous glucose monitoring within an integrated healthcare delivery system. *J Diabetes Sci Technol*. 2022 Mar;16(2):383-389.



Opportunities for Action



Employers Have Multiple Opportunities to Improve Employee Access to CGMs

Review the organization's CGM benefit design and make any changes needed to:

Cost

- Reduce or eliminate out-of-pocket costs

Coverage

- Provide coverage through the pharmacy benefit

Criteria

- Remove or simplify prior authorization criteria
-

Integrate CGMs into employer-sponsored diabetes management programs:

Awareness

- Align CGM criteria and benefit design with the program offerings
 - Incorporate CGM data into coaching guidance
-

For employers with onsite clinics:

Awareness

- Align the CGM criteria and benefit design with clinic-based offerings
- Educate clinic staff on CGMs

Questions?

Want to learn more
about CGMs?

Scan this code:

