

Editorials

Continuous Glucose Monitoring in Type 2 Diabetes Is Not Ready for Widespread Adoption

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There is great interest in technology to improve health; however, new devices do not always live up to the hype. Although continuous glucose monitoring may benefit patients with type 1 diabetes mellitus, there is limited evidence that it offers similar benefits in patients with type 2 diabetes, regardless of whether they are taking insulin.

Rather than directly measuring blood glucose levels, continuous glucose monitoring devices track levels indirectly by measuring interstitial fluid glucose levels via a subcutaneous sensor attached to an external transmitter located on the upper arm or abdomen. Some monitors communicate continually with a receiver such as a smartphone and will send alerts for hyperglycemia or hypoglycemia. Flash glucose monitoring devices (e.g., Freestyle Libre) do not notify patients but transmit data when the receiver is in close proximity to the transmitter.¹

Continuous glucose monitoring can alert patients with type 2 diabetes that they are becoming hypoglycemic, especially those using insulin who are at risk of severe hypoglycemia requiring urgent medical care. Although three studies have shown fewer episodes of hypoglycemia with continuous glucose monitoring, the ability to decrease the risk of severe hypoglycemia has not been demonstrated.²⁻⁴

No long-term studies have been performed to determine whether continuous glucose monitoring improves patient-oriented outcomes in type 2 diabetes. Compared with finger-stick monitoring, continuous glucose monitoring has not been shown to improve A1C levels after six months in patients receiving multiple daily insulin injections (7.7% vs. 8.0% in one study and 8.4% vs. 8.3% in another study).^{2,3} In a randomized study of 158 patients, there was no difference in overall or diabetes-specific quality of life at six months between patients using continuous glucose monitoring and those who were self-monitoring.³

The cost of continuous glucose monitoring ranges from \$2,500 to \$6,000 per year. A flash reading device costs approximately \$100, with replaceable sensors costing another \$120 to \$200 monthly.⁵ Other devices cost \$1,000 to \$1,400, with replaceable sensors costing an additional \$35 to \$100 every seven to 10 days. Yearly battery replacement costs about \$500.⁶ The cost-effectiveness of continuous glucose monitoring in patients with type 2 diabetes has

not been studied. Currently, Medicare pays for continuous glucose monitoring only in patients receiving insulin via a pump or multiple daily injections who require four or more daily finger-stick glucose measurements.⁷ Insurance companies, if they provide coverage, may require a letter of medical necessity and possibly additional documentation.

Continuous glucose monitoring has a few potential advantages. The ability to get in-the-moment glucose readings without a finger stick may be appealing to patients. Physicians may appreciate the longitudinal data on blood glucose excursions that the devices offer. However, as with other technology introduced into health care, the promise that more data will lead to better patient outcomes has not yet been realized. Most people with type 2 diabetes do not require self-monitoring of blood glucose, and unnecessary monitoring not only wastes money but can negatively impact quality of life.⁸ Until we have research supporting continuous glucose monitoring for patients with type 2 diabetes, especially those not receiving regular insulin injections, there are no patient-oriented benefits to justify its great expense and additional hassles for patients and physicians.

Editor's Note: Dr. Shaughnessy is an assistant medical editor for *AFP*.

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References

1. American Diabetes Association. 7. Diabetes technology: standards of medical care in diabetes—2019. *Diabetes Care*. 2019;42(suppl 1):S71-S80.
2. Haak T, Hanaire H, Ajjan R, et al. Flash glucose-sensing technology as a replacement for blood glucose monitoring for the management of insulin-treated type 2 diabetes. *Diabetes Ther*. 2017;8(1):55-73.
3. Beck RW, Riddleworth TD, Ruedy K, et al. Continuous glucose monitoring versus usual care in patients with type 2 diabetes receiving multiple daily insulin injections. *Ann Intern Med*. 2017;167(6):365-374.
4. Ehrhardt NM, Chellappa M, Walker MS, 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;5(3):668-675.
5. Continuous glucose monitoring cost. Accessed December 23, 2019. <https://www.howmuchisit.org/continuous-glucose-monitoring-cost>
6. Spero D. Is continuous glucose monitoring worth it? *Diabetes Self-Management*. Accessed February 7, 2020. <https://www.diabetesselfmanagement.com/blog/is-continuous-glucose-monitoring-worth-it>
7. Doheny K. Medicare to cover therapeutic CGM, sets criteria. Endocrineweb. November 7, 2017. Accessed December 23, 2019. <https://www.endocrineweb.com/news/diabetes/57179-medicare-cover-therapeutic-cgm-sets-criteria>
8. Simon J, Gray A, Clarke P, et al. Cost effectiveness of self monitoring of blood glucose in patients with non-insulin treated type 2 diabetes. *BMJ*. 2008;336(7654):1177-1180. ■