Review Article

The Role of a Pharmacist in Breaking Down Barriers to Improve Continuous Glucose Monitoring Use

by Erin Newkirk, PharmD, CDCES, BCPS, Sushma Dey, PharmD

Continuous glucose monitoring (CGM) systems are wearable devices that are inserted into the skin to measure interstitial glucose levels every 1-5 minutes throughout the day. CGM allows patients and clinicians to view glucose data trends, and the majority of systems are approved by the U.S. Food and Drug Administration (FDA) to be used for diabetes treatment decision making (Table 1). CGM use has been increasing and can be beneficial for patients who require self-monitoring of glucose. CGM systems can be prescribed for personal and professional use. "Personal" use refers to prescribing a CGM for the patient to use and view the transmitted data. The two types of personal CGMs on the market are real-time CGMs (rtCGMs) and intermittently scanned CGMs (isCGMs).[1] The major difference between the two is that rtCGMs automatically transmit a continuous stream of glucose data to a receiver, while isCGMs require the patient to scan the sensor to obtain glucose information.

Alternatively, professional-use CGM systems (Table 2) are purchased by the clinic and worn intermittently by patients, as a useful patient-teaching tool. They can provide important data for pattern identification and insulin dose adjustments. Professional CGMs can be set up in "blinded" or "unblinded" modes. Unblinded CGM allows patients to see glucose data in real time, while blinded CGM captures glucose data without influencing the patient's behavior in the moment.[6]

CGM has been shown to help people with diabetes improve their day-to-day management of diabetes and achieve positive long-term outcomes.[7] Studies have shown that, irrespective of insulin delivery, A1c reductions are greater with the use of CGM.[8] CGM use across the entire spectrum of people with diabetes is recommended by most experts. In previous guidelines, CGM was only proposed for people who did not meet glucose targets, had hypoglycemia unawareness, or experienced hypoglycemia.[9] The CGM selection criteria have been expanded to include everyone using a rapid-acting insulin. The 2021 American Diabetes Association (ADA) Standard of Medical Care guidelines now state that CGM is recommended for all patients who use multiple daily injections of insulin or pump therapy.[10]

TABLE 1. CGM Systems[2-5]

	Dexcom G6	FreeStyle Libre 14 day/FreeStyle Libre 2	Guardian 3	Eversense
CGM Type	rtCGM	isCGM	rtCGM	rtCGM
Calibration with fingerstick BG required?	No	No	Yes, at the minimum every 12 hours	Yes, at the minimum twice daily spaced 10-14 hours apart
FDA approved for treatment decisions?	Yes	Yes	No	Yes
Duration of Sensor Wear	10 days	14 days	7 days	90 days
Transmitter Information	Replace after 3 months	No transmitter	Rechargeable Replace after 122 uses or 1 year, whichever comes first	Rechargeable Replace Yearly

BG = blood glucose; CGM = continuous glucose monitor; isCGM = intermittently scanned CGM; rtCGM = real-time CGM

TABLE 2. Professional CGM Systems[2-5]

	Dexcom G6 Pro	FreeStyle Libre Pro	Medtronic iPro2
Blinding Options	Blinded or unblinded	Blinded	Blinded
Calibration with fingerstick BG required?	No	No	Yes, at the minimum four times a day
Duration of Sensor Wear	10 days	14 days	6 days

BG = blood glucose; CGM = continuous glucose monitor

Barriers to obtaining and successfully using CGM systems include misunderstanding of eligibility requirements; lack of knowledge about CGM systems and how to utilize the data; and the cost of obtaining and using the system. Pharmacists are in a key position to break down some of these barriers.

Insurance Coverage for CGM

Historically, the majority of insurance companies limited personal CGM coverage to patients with a diagnosis of type 1

diabetes. Medicare expanded coverage of therapeutic CGMs that are FDA-approved for making diabetes treatment decisions for patients with either type 1 or type 2 diabetes as long as multiple requirements are met (Table 3).

Medicare currently provides coverage for Dexcom, FreeStyle Libre and Eversense CGM systems, which are all approved for non-adjunctive use.[2-5] In other words, these CGM systems can be used as the primary device to make diabetes treatment decisions. At this time, some Wisconsin Medicaid plans cover CGM only for patients with type 1 diabetes. Wisconsin Medicaid will rarely cover personal FreeStyle Libre CGM, with some plans only covering personal Dexcom G6 CGM if the patient is being followed within an endocrine practice and a Dexcom G6 Professional session has been completed. Some plans require the patient to provide a 30- or 60-day glucose log demonstrating glucose testing of four or more times per day, and documentation of a recent provider visit. Depending on the insurance type, coverage may be through medical or pharmacy benefits. Most commercial insurance plans cover Dexcom and FreeStyle Libre through the pharmacy benefit. The process for everyone involved is much smoother when patients are able to receive their CGM through the pharmacy benefit; however, the majority of Medicare and Medicaid plans require CGM to go through as durable medical equipment (DME), which can add additional time and steps to complete before a person with diabetes can receive the CGM system.

As guidelines continue to recommend CGM use, systems have become more affordable and accessible. Despite advancements, the cost of personal-use CGM systems is still a barrier to their use, even with expanded insurance coverage. Personal-use CGM systems should be considered for all patients using insulin therapy. Professional-use CGM is an ideal option for those who cannot afford a personal device, as most persons with diabetes have coverage for professional-use CGM. It also serves as an opportunity for persons with diabetes to learn about how CGM works, experience what it is like to wear a device prior to considering personal-use CGM, and learn how daily lifestyle factors impact glucose control.

Pharmacists have a vital role in identifying potential candidates, guiding device selection, teaching patients how to use the device, and helping patients understand their data. There are also unique billing opportunities, using CPT codes 95249 (personal CGM training/download), 95250 (professional CGM insertion/download), and CPT 95251 (CGM interpretation).[11] Services associated with CPT codes 95249 and 95250 may be completed by a pharmacist in a face-to-face format with the requirement of 72 hours of data collection to be billed. CGM interpretation associated with CPT code 95251 can be completed in a non-face-to-face format. The CPT code 95251 provides reimbursement for interpretation and analysis of CGM data and is only billable by a physician or licensed non-physician provider with potential opportunities for pharmacist involvement with this service through a collaborative practice agreement.[12]

TABLE 3. Medicare Criteria for CGM Use[11]

Patient has diabetes
Evidence of SMBG ≥ 4 times per day
Patient is insulin-treated with ≥ 3 daily insulin injections or using an insulin pump
Insulin regimen requires frequent adjustments on basis of glucose readings
Follow-up with the treating healthcare provider a minimum of every six months to assess diabetes treatment

CGM = continuous glucose monitor; SMBG = self-monitoring blood glucose

The Importance of CGM Data Use and Interpretation

To ensure optimal use, the ADA recommends that patients receiving CGM systems obtain robust diabetes education, training and support, and medication management based on data from the CGM reports.[13] Patients benefit from education on numerous aspects of using CGM. When patients initially use CGM, a common reaction is to chase the glucose readings, which can often result in hypoglycemia followed by hyperglycemia, or a "roller coaster" glucose pattern.

Pharmacists understand the pharmacokinetics of insulin therapy and are in a key position to discuss the onset, peak, and duration of action of insulin to avoid insulin stacking and over-treating high/low glucose readings. Patients can benefit from discussing glucose patterns with pharmacists who can provide insight into how factors like dose-timing, dietary intake, and exercise are impacting insulin action and glucose levels.

Retrospectively reviewing data with patients requires both patients and healthcare providers to understand the steps for sharing CGM data. Each CGM system allows healthcare providers and caregivers to have access to glucose data, but there can be multiple barriers to uploading CGM data without proper education and equipment. The clinic or pharmacy staff need to understand which platform can be used to upload data for each CGM device. If patients are using smartphones as their display device, patients can be invited to automatically share their data to the company's platform option(s) for the diabetes team to review the data. If the patient is using a reader or receiver as the display device, patients can be invited to share their data with the use of a computer and USB cord to upload the data. Data management systems used to sync patient blood glucose meters, such as Glooko and Tidepool, can also be used to manage data from select CGM systems. Table 4 provides information about data sharing for commonly used CGM systems.

Some patients might feel overwhelmed by having access to all the CGM data, or lack the diabetes skills to process the information. It is crucial that patients are actively involved in the CGM review. Pharmacists and other healthcare providers are the coaches in the background, who know the evidence and have the experience, but treatment decisions need to take into account patient lifestyle and preferences. As a coach, it is important to always find something going well before discussing any areas of opportunity to improve glucose control.

Depending on the CGM device, a report

TABLE 4. CGM Data Sharing Applications, Sharing Options, and Display Options[4,14-16]

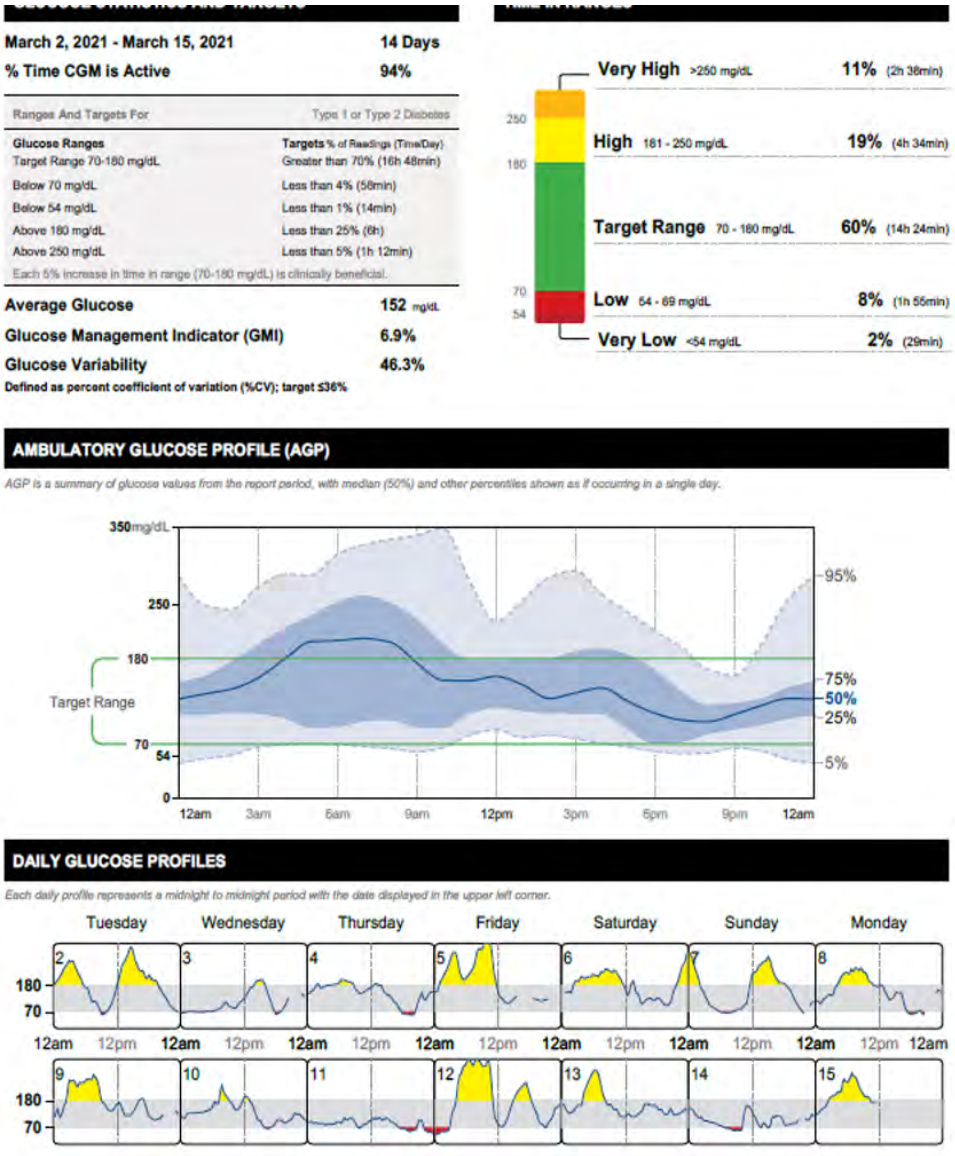
CGM System	Data Sharing Methods	Share With	Display Options	Notes
Dexcom G6	**Dexcom CLARITY:** cloud-based software to view glucose trends on computer or app **Dexcom G6 app**[a]**:** smartphone app for patient to view glucose data **Dexcom Follow:** smartphone app for caregivers to view glucose data if patient is using mobile device	• Healthcare professionals via Dexcom CLARITY after accepting to share data via sharing code provided by clinic/ pharmacy • Caregivers via Dexcom Follow app (up to 10 followers)	• Receiver • Android™ or iOS smartphone • Apple watch® and Android watch OS display screens (with paired compatible smartphone) • T:slim X2® (Tandem) insulin pump • Compatible with Glooko and Tidepool	• Smartphone and reader display device options • Display device must be within 20 feet of Dexcom transmitter for glucose readings • Receiver stores 120 glucose readings, important to upload receiver to Clarity at least every 30 days to ensure data is not lost • Mobile device automatically uploads to Dexcom CLARITY every 3 hours
FreeStyle Libre Systems	**FreeStyle Libre 14 day** **FreeStyle LibreView:** cloud-based software to view glucose trends on computer **LibreLink**[a]**:** smartphone app for patient to view glucose data **LibreLinkUp**[a]**:** smartphone app for caregivers to view glucose data	• Healthcare professionals via LibreView • Caregivers via LibreLinkUp app (up to 20 followers)	• Reader • Android™ or iOS smartphone • FreeStyle Libre Reader is compatible with Tidepool	• Smartphone and reader display device options • Patients must scan at least every 8 hours for glucose readings • Reader stores up to 90 days of glucose data that can be viewed for historic trends • Automatic data upload to LibreView each time sensor is scanned
	FreeStyle Libre 2 **FreeStyle LibreView:** cloud-based software to view glucose trends on computer No smartphone app available yet	• Healthcare professionals via LibreView • FreeStyle Libre 2 users cannot share data with caregivers at this time	• Reader only • FreeStyle Libre 2 is compatible with Tidepool	• Reader display option • Patients must scan at least every 8 hours for glucose readings • Reader stores up to 90 days of glucose data that can be viewed for historic trends • No automatic data upload at this time
Medtronic Guardian™ Connect	**CareLink:** cloud-based software to view glucose trends on computer **Guardian™: Connect US**[a] smartphone app for patient and caregivers to view glucose data **Sugar IQTM Diabetes Assistant**[b] - companion app that identifies glucose patterns & activities affecting them	• Healthcare professionals via CareLink • Medtronic Guardian Connect cannot share data with caregivers	• Android™ or iOS smartphone • iPad® (with compatible iPhone) • compatible with InPen™ (Medtronic) smart insulin pen app	• Unable to use GuardianTMConnect if patient is using insulin pump (670G) integration • Smartphone is the only way to view/ upload data, no separate display device available
Eversense	**Eversense DMS:** software to view glucose trends on computer **Eversense mobile app**[a]**:** smartphone app for patient to view glucose data **Eversense Now app:** smartphone app for caregivers to view glucose data	• Healthcare professionals via Eversense DMS • Caregivers via Eversense Now app (up to 5 followers)	• Android™ or iOS smartphone • Apple watch® and iPad® (with paired compatible iPhone)	• Smartphone is the only way to view/ upload data, no separate display device available

CGM = continuous glucose monitor; DMS = data management system
a Application available on Android and iPhone smartphones
b Application available on iPhone smartphones only

could include up to 35 pages of data, which can make it overwhelming to identify which reports are most useful to optimize the time spent during the visit. The International Diabetes Center created a format for a standardized, single-page report that includes glucose statistics, glucose patterns, and glucose trends (Figure 1) called the Ambulatory Glucose Profile (AGP).[17,18] The AGP is the gold standard of presentation data of CGM devices, analogous to the electrocardiogram (EKG). AGP should be as familiar and easily interpreted as an EKG record. Any clinician looking at an EKG doesn't need to ask about which device is being used, but about how the heart is doing. The AGP report is a one-page report that allows clinicians to look visually and quickly at the glucose data, regardless of which CGM device is being used.

The AGP report defaults to data from the last 14 days, as that period has been found to correlate well with 3 months of CGM data. It is important to have at least 10 days or ~70% of the data on the report in order to make sure there is a reliable representation of the patient's usual

FIGURE 1. Ambulatory Glucose Profile Report[17]



Printed with permission from the International Diabetes Center. The Ambulatory Glucose Profile was developed by International Diabetes Center, HealthPartners Institute, Minneapolis, MN.

routine.[19] The AGP report is organized into 3 sections.

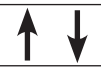
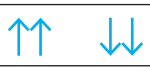
The top section of the AGP includes glucose statistics and time in range targets, which provide information on whether any action needs to be taken. Information on glucose exposure includes the average glucose over the time range of collected data (usually 14 days); and the glucose management indicator (GMI). GMI was formerly called "estimated A1c"; however, it was confusing to patients, as it did not match their lab A1c value. GMI is calculated directly from the average glucose value from the CGM device, which provides a more direct and accurate measure of glucose levels that can be calculated for a shorter period of time. Since GMI is not determined by how much sugar is attached to hemoglobin molecules on red blood cells, it eliminates common misinterpretations of the variance in A1c, caused by a number of factors including kidney disease, iron deficiency, sickle cell disease, the use of certain medications, and differences between racial and ethnic groups.[20]

The time in range targets on the AGP report are considered as important as A1c. Like A1c, patient and disease factors are used to determine optimal time in range (TIR) for each individual patient. The 2019 International Consensus report on Time in Range recommends that patients have a TIR goal of more than 70% of the time within the target range of 70-180 mg/dl, less than 4% of time spent below 70 mg/dl, and less than 25% of the time spent above 180 mg/dl. Since most patients do not break down their day by percent of time, it can be helpful to highlight that 70% is just under 17 hours of the day, 4% is around 1 hour of the day, and 25% is 6 hours of the day. It has been estimated that for every 10% (roughly 2.5 hours/day) increase in TIR, there is a 0.5%-0.8% A1c reduction.[17] A truly landmark observation associating TIR with the development or progression of retinopathy, and the development of microalbuminuria, using the Diabetes Control and Complications Trial (DCCT) data validated the use of TIR as an outcome measure for clinical trials.[7] The 2021 ADA guidelines state that time in range (TIR) can be used for assessment of glycemic control, has been shown to be associated with microvascular complications, and is an acceptable study end point for clinical trials.[10]

The last section of the glucose metrics focuses on glycemic variability. Standard deviation (SD) is one way to evaluate variability; however, there is not a specific target as the SD is highly influenced by the mean glucose. Most experts prefer to evaluate glucose variability by evaluating the coefficient of variation (CV), which is calculated by taking the standard deviation divided by the mean times 100%. This division helps "correct" and normalize glucose variability, allowing a single variability goal of < 36%.[21] The CV best correlates with the relative risk of hypoglycemia. The higher the CV, the more variable the glucose is and the more problematic it is for the patient to live their normal life.

If the glucose metrics discussed above are not at goal, the next step is to move on to evaluate the graphical sections of the AGP report. The graphical sections of the AGP report help identify what action should take place.[18] The middle portion of the report includes a profile graph that provides a visual snapshot of glucose trends and patterns derived from the period of data acquisition. This graph gives the big picture and helps quickly identify any trouble spots. Having patients share their story when evaluating the graphs can identify lifestyle

TABLE 5. CGM System Arrows and Interpretation for Select Systems[2-5]

Arrow Direction	Interpretation for Glucose Trend			
	Dexcom G6	FreeStyle Libre 2	Guardian 3	Eversense
→			N/A	
	Increasing/decreasing <1 mg/dL/min			
↗↘				
	Increase/decrease 30-60 mg/dL in 30 min	Increase/decrease 1- 2 mg/dL/min	Increase/decrease 1 mg/dL/min	Increase/decrease 1- 2 mg/dL/min
↑↓				
	Increase/decrease 60-90 mg/dL in 30 min	Increase/decrease > 2 mg/dL/min	Increase/decrease 2 mg/dL/min	Increase/decrease > 2 mg/dL/min
↑↑↓↓		N/A		N/A
	Increase/decrease > than 90 mg/dL in 30 min		Increase/decrease 3 mg/dL/min	

CGM = continuous glucose monitor; dL = deciliter; mg = milligram; min = minute; N/A = not applicable

factors that might be impacting glucose control. It can be helpful to mark up the graph with key events during a typical day, such as awakening, meal times, medication timing, bedtime, exercise, etc. The goal for this profile graph is flat, narrow, and in range. Some helpful questions include the following:

- What do you think is causing this pattern of glucose?
- What do you think would help improve your glucose control?

The bottom of the AGP report shows the daily glucose profile, which allows for verification of patterns spelled out in a calendar format. Looking at the daily patterns with patients helps identify behavioral changes needed to do better in real time, day-to-day management. Once any troubled area is identified, an actionable item should be identified with the patient. Of course, the No. 1 patient safety priority would be to eliminate any hypoglycemia.

In the end, both patients and providers have access to the one-page AGP report, which shows a big-picture view to help develop a diabetes management plan. When looking at the retrospective CGM data, healthcare providers need to involve their patients, and review the AGP report together. Patients using CGM data in real time is the way to get the most out of the technology on the path to successful diabetes management.

CGM Trend Arrows and Alarms

CGM trend arrows are one of the most useful components of CGM systems, as they can help prevent real-time hypoglycemia and hyperglycemia. Each CGM device has trend arrows, which can inform a patient if the glucose trend is rising, falling, or staying relatively steady. (Table 5). It is important to educate the patient on how to respond to the arrows, to avoid overtreatment of glucose levels. An important consideration is that the arrow direction is determined by the past 10 to 20 minutes of glucose values, and patients should evaluate trend arrows and keep in mind that the arrow predicts what glucose levels will likely be in the next 20 to 30 minutes. If a patient is having issues with receiving glucose trends, ensure that the patient is keeping the CGM display device within the distance specified by the manufacturer of the transmitter (i.e. 20 feet).

All CGM devices besides the FreeStyle Libre 14 day have CGM alarms, which can be one of the most useful components to help prevent hypoglycemia and prolonged hyperglycemia. However, alarms can be incredibly bothersome if not set correctly. It is important to work with each patient to identify the glucose level threshold—at what level is glucose considered out of range for that patient, and the alarm should sound? Pharmacists can help patients identify the best alarm settings so the alerts are helpful, versus causing alarm fatigue.

Solutions to CGM Sensor Placement Issues

CGM sensor placement and skin issues can be a challenge for some patients. Some patients may experience allergic reactions or contact dermatitis. Some reactions can be prevented by placing the sensor on thoroughly dry, clean, oil-free skin; rotating sites to preserve skin integrity; and avoiding areas of the skin that are already compromised. Placing the sensor in an area that avoids friction, such as the waistline, is also helpful. Patients who still experience skin reactions can use a skin protection barrier film or a barrier patch under the sensor. Some CGM manufacturers provide barrier patches at no cost to patients; patients can call customer service for help with sensor placement. There are also a variety of over-the-counter options for skin protection (Tables 6, 7).

Careful sensor removal techniques or the use of products to help with removal is also important. Diphenhydramine, hydrocortisone, or polysporin/bacitracin ointments can be used for acute skin treatment if needed.[22] Patients can also

TABLE 6. Options for Patients with Adhesive- Allergy/Skin Reactions[22,24-25]

Product Type	Product	Notes
Non-adhesive wraps: • Coban • Ace	Elastic wraps should be wrapped loosely and removed during sleep to avoid excessive tissue compression	Provides extra support to keep CGM in place during activity
Benadryl Antihistamine Spray®	Creates a thin barrier on skin	Useful to prevent reactions to CGM adhesives
Fluticasone Nasal Spray (Paret, M, 2020)	Can be sprayed onto skin as a topical steroid to prevent skin irritation/inflammation[24]	• Useful to prevent reaction to CGM adhesives • Spray should not decrease adhesive properties of CGM

CGM = continuous glucose monitor

TABLE 7. Adhesive/Barrier Product Options to Improve CGM Wear[22, 24-25]

Product Type	Product	Properties	Notes
Liquid Adhesives	Skin Tac™	• Barrier protection • Latex-free and hypoallergenic	• Available in wipes and liquid • May require removal product (TacAway™)
	Mastisol® Liquid Adhesive	Strongest liquid adhesive	• Available in liquid, swabs, and single-use vials • May require removal agent (Detachol®)
	SKIN-PREP®	• Barrier protection • Weakest liquid adhesive	Available in wipes and liquid
Transparent films	• IV3000 • Tegaderm HP™ (holding power)	• Physical barrier between skin and adhesive patch • Hypoallergenic	• Film may peel with sweating and water exposure • Thin film can be cut to fit specific CGM device/ customized to wearer preference
Adhesive Patches	• GrifGrips® • RockaDex • Simpatch™	• Cloth-like patches • Flexible, breathable, water resistant	• All listed products have pre-cut patches customized to fit Dexcom, Libre, and Guardian CGM systems. • Several colors and designs available
Adhesive Tape	**Clear plastic tapes:** • BlendtermTM • TransporeTM **Surgical Tape** **Kinesiology tape:** • RockTape® • KT Tape	Kinesiology tapes are cloth-like and water-resistant	Best suited to be used in addition to adhesive patches

CGM = continuous glucose monitor

consider using a different site; there has been no observed difference in sensor accuracy between upper arm and abdominal sites.[23] In areas where there is scar tissue from insulin injections, there can be sensor accuracy concerns, so patients should avoid those areas.

Some people have difficulty keeping the device in place for the full wear duration. Pharmacists are in a key position to help advise patients on liquid adhesive agents, adhesive patches, or tapes that can help keep the sensor in place for the indicated time (Table 7). Liquid adhesives can be used to create an additional line of adhesive on the skin where the device will be applied. Liquid adhesives should be applied as a ring around where the device will be placed, to avoid placing the adhesive in the exact spot where the CGM sensor is inserted. Several liquid adhesives also provide barrier protection that may help to reduce skin irritation from device placement. For patients who continue to have issues with displacement of CGM after trying liquid adhesives, transparent films and adhesive patches can be used to help hold the transmitter in place. Patients who are athletes, swimmers, or spend time outdoors will benefit from using adhesive patches and tapes that are breathable to protect the CGM from being removed due to sweat and/or excess water exposure.

Conclusion

With improved accuracy and affordability, CGM has quickly become a mainstay of diabetes management. It is important that patients know that CGM is not simply a replacement for fingerstick blood glucose monitoring, but a diabetes tool to help optimize glucose control. With CGM, patients have access to continuous glucose data to help identify glucose trends, adjust lifestyle factors, make informed treatment decisions, reduce the risk of hypoglycemia, and augment insulin delivery in automated insulin dosing (AID) systems. It is important to emphasize to a person with diabetes that they will get the most out of CGM by using both individual, real-time focused interventions to assess glucose status or the potential of hypoglycemia, and evaluating the "big picture" that comes from retrospective review of daily patterns. CGM technology can facilitate patient-centered discussions in clinical decision making and empower behavioral change. Pharmacists can incorporate CGM into diabetes management practices to help optimize therapy and be involved with a service that allows pharmacists to work at the top of their license that benefits patients.

Erin Newkirk is a Clinical Pharmacist and Sushma Dey is a PGY1 Pharmacy Resident at Froedtert and the Medical College of Wisconsin in Milwaukee, WI.

PR *This article has been peer-reviewed. The contribution in reviewing is greatly appreciated!*

Disclosure: The author(s) declare no real or potential conflicts or financial interest in any product or service mentioned in the manuscript, including grants, equipment, medications, employment, gifts, and honoraria.

References

1. Kruger DF, Edelman SV, Hinnen DA, Parkin CG. Reference guide for integrating continuous glucose monitoring into clinical practice. *Diabetes Educ*. 2019;45(suppl 1):3S-20S. doi: 10.1177/0145721718818066
2. Dexcom. Dexcom continuous glucose monitoring. Accessed May 24 2021. https://www.dexcom.com/g6-cgm-system
3. Abbot. FreeStyle Libre. Accessed March 10, 2021. https://www.freestyle.abbott/us-en/products/continous-glucose-monitor-app.html
4. Medtronic Diabetes. The Guardian Connect System. Accessed March 10, 2021. https://www.medtronicdiabetes.com/products/guardian-connect-continuous-glucose-monitoring-system
5. Eversense Diabetes. Eversense Continuous Glucose Monitoring System. Accessed May 24, 2021. https://www.eversensediabetes.com/mobile-app.
6. Association of Diabetes Care and Education Specialists. The diabetes care and education specialist's role in continuous glucose monitoring. Updated March, 2021. Accessed May 13, 2021. https://www.diabeteseducator.org/practice/educator-tools/diabetes-management-tools/self-monitoring-of-blood-glucose
7. Beck RW, Bergenstal RM, Riddlesworth TD, et al. Validation of time in range as an outcome measure for diabetes clinical trials. *Diabetes Care*. 2019;42(3):400-405. doi: 10.2337/dc18-1444
8. Mulinacci G, Alonso GT, Snell-Bergeon JK, Shah VN. Glycemic outcomes with early initiation of continuous glucose monitoring system in recently diagnosed patients with type 1 diabetes. *Diabetes Technol Ther*. 2019;21(1):6-10. doi: 0.1089/dia.2018.0257
9. American Diabetes Association. 7. Diabetes technology: standards of medical care in diabetes -2020. *Diabetes Care.* 2020;43(suppl 1):S77-S88. doi: 10.2337/dc20-S007
10. American Diabetes Association. 7. Diabetes technology: standards of medical care in diabetes -2021. *Diabetes Care.* 2021;44(suppl 1):S85-S99. doi. 10.2337/dc21-S007
11. United States Department of Health and Human Services. Medicare Coverage of Diabetes Supplies, Services, and Prevention Programs. Updated December 2020. Accessed February 14, 2021. https://www.medicare.gov/Pubs/pdf/11022-Medicare-Diabetes-Coverage.pdf
12. American Association of Clinical Endocrinologists. CPT codes 95249, 95250, 95251. Accessed February 21, 2021. https://www.aace.com/practice-management/cpt-codes-95249-95250-and-95251
13. American Diabetes Association. 6. Glycemic targets: standards of medical care in diabetes -2021. *Diabetes Care.* 2021;44(supp 1):S73-S84. doi: 10.2337/dc21-S006
14. Dexcom. Dexcom Mobile & Watch Apps. Accessed March 10, 2021. https://www.dexcom.com/mobile-and-watch-apps
15. FreeStyle Libre. Discover the mobile apps. Accessed March 10, 2021. https://www.freestyle.abbott/us-en/products/continous-glucose-monitor-app.html
16. Eversense Diabetes. Mobile app. Accessed March 10, 2021 https://www.eversensediabetes.com/mobile-app
17. Battelino T, Danne T, Bergenstal RM, et al. Clinical targets for continuous glucose monitoring data interpretation: recommendations from the International Consensus on Time in Range. *Diabetes Care*. 2019;42(8):1593-1603. doi: 10.2337/dci19-0028
18. Johnson ML, Martens TW, Criego AB, Carlso AL, Simonson GD, Bergenstal RM. Utilizing the Ambulatory Glucose Profile to standardize and implement continuous glucose monitoring in clinical practice. *Diabetes Technol Ther.* 2019;21(suppl 2):S2:17-25. doi: 10.1089/dia.2019.0034
19. Riddlesworth TD, Beck RW, Gal RL, et al. Optimal sampling duration for continuous glucose monitoring to determine long-term glycemic control. *Diabetes Technol Ther.* 2018;20(4):314-316. doi: 10.1089/dia.2017.0455
20. Bergenstal RM, Beck RW, Close KL, et al. Glucose Management Indicator (GMI): a new term for estimating A1c from continuous glucose monitoring. *Diabetes Care.* 2018;41(11):2275-2280. doi: 10.2337/dc18-1581
21. Monnier L, Colette C, Wojtusciszyn A, Dejager S, Renard E, Molinari N. Towards defining the threshold between low and high glucose variability in diabetes. *Diabetes Care.* 2017:40(7):832-838. doi: 10.2337/dc16-1769
22. Messer LH, Berget C, Beatson C, Polsky S, Forlenza GP. Preserving skin integrity with chronic device use in diabetes. *Diabetes Technol Ther.* 2018;20(S2):S254-S264. doi: 10.1089/dia.2018.0080
23. Steineck IIK, Mahmoudi Z, Ranjan A, Schmidt S, Jorgensen JB, Norgaard K. Comparison of continuous glucose monitoring accuracy between abdominal and upper arm insertion sites. *Diabetes Technol Ther.* 2019;21(5):295-302. doi:10.1089/dia.2019.0014
24. Dexcom Continuous Glucose Monitoring. How can I keep my Dexcom sensor adhered for the full 10 days? Updated February 8, 2021. Accessed February 24, 2021. https://www.dexcom.com/faqs/adhesive-tips
25. Paret M, Barash G, Rachmiel M. "Out of the box" solution for skin problems due to glucose-monitoring technology in youth with type 1 diabetes: real-life experience with fluticasone spray. *Acta Diabetol.* 2020;57(4):419-442. doi: 10.1007/s00592-019-01446-y