

September 2020 ~ Resource #360904

## Continuous Glucose Monitoring FAQs

Continuous glucose monitoring (CGM) is the newest way to monitor glucose levels. Most CGMs check glucose about every one to five minutes, display readings, and can alert patients when glucose levels are higher or lower than customizable, preset thresholds. Currently available CGMs can show trends as glucose levels rise or fall. CGMs can display graphs showing glucose levels over specified periods of time. Some CGMs still require fingerstick glucose readings in order to make treatment decisions. The *Dexcom G5 Mobile*, *Dexcom G6*, and *FreeStyle Libre* systems<sup>a</sup> are approved to be used alone (without fingerstick glucose readings) to adjust meds and make treatment decisions.<sup>4,20,25,36,43</sup> For CGMs to be most beneficial, the collected data **should be used to guide lifestyle or med changes**. The chart below answers common questions about continuous glucose monitoring.

Topic/Question	Answer/Pertinent Information
<p><b>What different types and options for continuous glucose monitoring are available?</b></p>	<p><b>Professional CGM</b> may be available at some prescriber's offices, usually an endocrinologist. It can be provided to patients on a short-term basis in order to analyze glucose trends (e.g., three days).<sup>2</sup> Examples include the <i>FreeStyle Libre Pro</i>, <i>Dexcom G6 Pro</i>, and <i>iPro2 Professional</i>.<sup>2,33</sup></p> <p><b>Personal CGM</b> is used long-term by a patient as a part of their diabetes management.<sup>2</sup> Two different types of personal CGMs are available.</p> <ul style="list-style-type: none"> <li>• <b>Stand-alone CGM:</b> provides continuous glucose levels, with accessible tracking and trending. Examples are: <ul style="list-style-type: none"> <li>○ <i>Dexcom G4 Platinum</i>:<sup>c</sup> compatible with <i>Tandem T:slim X2</i> systems WITHOUT basal- or IQ-technology<sup>b</sup> (U.S. only) insulin pumps.</li> <li>○ <i>Dexcom G5 Mobile</i><sup>c</sup> and <i>Dexcom G6</i>: compatible with both Apple and Android technology. <ul style="list-style-type: none"> <li>▪ See <a href="https://www.dexcom.com/faqs/devices-compatible-with-dexcom-cgm-apps">https://www.dexcom.com/faqs/devices-compatible-with-dexcom-cgm-apps</a>.</li> </ul> </li> <li>○ <i>Medtronic Guardian Connect</i> (U.S. only): compatible with most Windows and Apple operating systems.<sup>1</sup></li> <li>○ <i>Senseonics Eversense</i> (U.S. only): compatible with both Apple and Android technology.<sup>1</sup></li> <li>○ <i>FreeStyle Libre</i> systems<sup>a</sup>: use flash glucose monitoring (glucose readings captured when scanned for).<sup>10</sup> <ul style="list-style-type: none"> <li>▪ Glucose values are reported when the user scans the sensor by passing a reader close to the sensor.<sup>10</sup></li> <li>▪ Has a built-in glucose meter compatible with <i>FreeStyle Precision Neo</i> strips.<sup>4,44</sup></li> </ul> </li> </ul> </li> <li>• <b>Combination insulin pump/CGM:</b> integrates continuous glucose readings with insulin pump technology. Examples are: <ul style="list-style-type: none"> <li>○ <i>Medtronic MiniMed 530G</i> (U.S. only; discontinued, but patients may still use), <i>630G</i>, and <i>670G</i>. Uses <i>Medtronic Enlite</i> (<i>530G</i> and <i>630G</i>) and <i>Guardian Sensor 3</i> (<i>630G</i> and <i>670G</i>). <ul style="list-style-type: none"> <li>▪ Compatible with Bayer's <i>Contour Next Link 2.4</i> wireless meter (<i>630G</i> and <i>670G</i>).<sup>17,18</sup></li> </ul> </li> <li>○ <i>Tandem T:slim X2</i> systems<sup>b</sup> (U.S. only [uses <i>Dexcom G6</i> CGM sensors]). <ul style="list-style-type: none"> <li>▪ Compatible with <i>Dexcom G6</i> CGM.<sup>38,45</sup></li> </ul> </li> </ul> </li> </ul>
<p><b>How does</b></p>	<ul style="list-style-type: none"> <li>• Most CGM systems consist of three basic parts to measure, record, and display glucose readings. These parts usually include</li> </ul>

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Topic/Question	Answer/Pertinent Information
<p><b>continuous glucose monitoring work?</b></p>	<p>a sensor (with a fine needle for insertion into the skin), transmitter, and receiver.</p> <ul style="list-style-type: none"> <li>○ The <i>FreeStyle Libre</i> systems<sup>a</sup> are slightly different. Instead of the transmitter and receiver, they use a portable reader. The reader is manually waved over the sensor to capture glucose readings.<sup>4,25</sup></li> <li>○ The <i>FreeStyle Libre 2</i> (U.S. only) system has optional alarms that can be turned on for highs and lows, as well as for loss of signal between the reader and the sensor. Highs and lows are only captured when the sensor is within 20 feet of the reader.<sup>49,50</sup></li> </ul> <ul style="list-style-type: none"> <li>● <b>Sensor:</b> acts similar to a test strip to measure glucose values.<sup>2</sup> <ul style="list-style-type: none"> <li>○ Measures glucose level within interstitial fluid (fluid just below the surface of the skin).<sup>2</sup> <ul style="list-style-type: none"> <li>▪ Test strips measure glucose levels within blood.</li> <li>▪ Interstitial fluid glucose levels may lag behind blood glucose readings by a few minutes, especially when glucose levels are changing.<sup>2,5</sup></li> </ul> </li> <li>○ Sends an electric signal through a wire to the transmitter (except for <i>FreeStyle Libre</i> systems<sup>a</sup>).</li> <li>○ Most sensors need to be changed every seven or ten days (14 days for <i>FreeStyle Libre 14-day</i> and <i>Libre 2</i> systems, up to 90 days [sensor implanted by a healthcare provider] for <i>Senseonics Eversense</i>).<sup>1,4,25,41</sup></li> </ul> </li> <li>● <b>Transmitter:</b> attaches to sensor base and sends glucose levels to the receiver or reader to display results.<sup>1,2</sup> <ul style="list-style-type: none"> <li>○ Transmitters must be within range of the receiver for proper functioning. Acceptable distances are: <ul style="list-style-type: none"> <li>▪ within six feet (2 meters [Canada]):<sup>16-18</sup> <i>MiniMed 530G</i> (U.S. only; discontinued, but patients may still use), <i>630G</i>, and <i>670G</i>.</li> <li>▪ within 20 feet (6 meters [Canada]):<sup>19,20,35,37,38,43,45</sup> <i>Dexcom G4 Platinum</i>,<sup>c</sup> <i>Dexcom G5 Mobile</i>,<sup>c</sup> <i>Dexcom G6</i>, <i>Medtronic Guardian Connect</i> (U.S. only), and <i>Tandem T:slim X2</i> systems<sup>b</sup> (U.S. only).</li> </ul> </li> <li>○ The <i>Senseonics Eversense</i> (U.S. only) transmitter is applied daily over the implanted sensor and must be within 24.9 feet (7.6 meters [Canada]) of the app for effective wireless communication.<sup>41</sup></li> </ul> </li> <li>● <b>Receiver or Reader:</b> displays current and stored glucose readings.<sup>1,4,25</sup> <ul style="list-style-type: none"> <li>○ Updates in real time (receivers), or when scanned within 1.5 inches (4 cm) of sensor (<i>FreeStyle Libre</i> systems<sup>a</sup>). <ul style="list-style-type: none"> <li>▪ Patients should scan <i>FreeStyle Libre</i> sensors at least once every eight hours.<sup>4,24,25,50</sup></li> <li>▪ Patients can use the <i>FreeStyle LibreLink</i> app on their smartphone (compatible with most Apple and Android phones) instead of the reader to scan for results with the <i>FreeStyle Libre</i> sensors.<sup>32</sup></li> </ul> </li> <li>○ Displays trends to aid in decisions about treating highs and lows.<sup>2</sup></li> <li>○ Receiver not required for <i>Senseonics Eversense</i>. Instead, data are sent to mobile device.<sup>1,41</sup></li> </ul> </li> </ul>
<p><b>Which patients</b></p>	<ul style="list-style-type: none"> <li>● Most of the data supporting the use of CGM are in patients with type 1 diabetes.<sup>12</sup></li> </ul>

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Topic/Question	Answer/Pertinent Information
<b>are most appropriate for continuous glucose monitoring?</b>	<ul style="list-style-type: none"> <li>• U.S. endocrinology experts believe CGM should be available to <b>all patients using insulin</b> regardless of diabetes type.<sup>12</sup></li> <li>• CGMs can be used to guide lifestyle and med changes, but may be most appropriate for the following patients: <ul style="list-style-type: none"> <li>○ patients at risk from hypoglycemia (e.g., athletes, elderly, patients with renal impairment)<sup>12</sup></li> <li>○ patients with hypoglycemia unawareness<sup>10,24</sup></li> <li>○ patients with frequent hypoglycemia<sup>10,24</sup></li> <li>○ patients unable to reach A1C goals because of hypoglycemia<sup>31</sup></li> </ul> </li> </ul>
<b>What are the approved ages with available continuous glucose monitors?</b>	<ul style="list-style-type: none"> <li>• <i>Dexcom G4 Platinum Pediatric</i> is approved for patients between the ages of two and 17 years old.<sup>37</sup></li> <li>• <i>Dexcom G4 Platinum</i>,<sup>c</sup> <i>FreeStyle Libre</i>, <i>Freestyle Libre 14-day</i>, and <i>Senseonics Eversense</i> are approved for patients ≥18 years old.<sup>4,19,25,41</sup></li> <li>• <i>Dexcom G5 Mobile</i> and <i>Dexcom G6</i> are approved for patients at least two years old.<sup>20,36,43</sup></li> <li>• <i>FreeStyle Libre 2</i> (U.S. only) is approved for patients at least four years old.<sup>49,50</sup></li> <li>• <i>Medtronic MiniMed 530G</i> (U.S. only; discontinued, but patients may still use) is approved for patients ≥16 years old.<sup>16</sup></li> <li>• <i>Medtronic MiniMed 630G</i> (with <i>Guardian Sensor 3</i>) is approved for patients ≥14 years old.<sup>1,17</sup></li> <li>• <i>Medtronic MiniMed 670G</i> is approved for patients ≥7 years old.<sup>18</sup></li> <li>• <i>Medtronic Guardian Connect</i> (U.S. only) is approved for patients between the ages of 14 and 75 years old.<sup>35</sup></li> <li>• <i>Tandem T:slim X2</i> systems (U.S. only) is approved for patients ≥6 years old.<sup>40</sup></li> </ul>
<b>What instructions should be given to patients about glucose sensors?</b>  <i>Continued... Sensor</i>	<ul style="list-style-type: none"> <li>• To avoid irritation, instruct patients to avoid placing sensors on areas that experience rigorous movement during exercise, under a belt, or on the waistline.<sup>14,15</sup></li> <li>• Scarred or tattooed areas should not be used for sensor insertion/placement.<sup>13</sup></li> <li>• The abdomen is the most common part of the body used for sensor placement.<sup>14,15,19,20</sup> <ul style="list-style-type: none"> <li>○ The abdomen is not used for <i>FreeStyle Libre</i> sensors. Apply these on the back of the upper arm.<sup>4</sup></li> <li>○ <i>Dexcom G5 Mobile</i> or <i>Dexcom G6</i> sensors can also be placed on the upper buttock for children ages two to 17 years old.<sup>20,43</sup></li> <li>○ <i>Guardian Connect</i> sensors can also be placed on the back of the upper arm.<sup>35</sup></li> </ul> </li> <li>• For most sensors, patients need to wait <b>two hours</b> after sensor placement for glucose readings to be available.<sup>1</sup> <ul style="list-style-type: none"> <li>○ It takes <b>1 hour</b> for the <i>FreeStyle Libre</i> systems<sup>a</sup> to provide glucose readings, but readings in the first <b>12 hours</b> of initial placement need to be confirmed with a finger-stick glucose before they're used to make treatment decisions.<sup>4,25,50</sup></li> <li>○ It takes <b>24 hours</b> after sensor implantation (by healthcare provider) for the <i>Senseonics Eversense</i> to provide glucose readings.<sup>1,41</sup></li> </ul> </li> <li>• Teach patients to clean skin thoroughly (e.g., first with soap and water, then with an alcohol swab) and dry completely prior to placing sensors.</li> <li>• Patients may have difficulty <b>maintaining sensor adhesion</b>. For example: <ul style="list-style-type: none"> <li>○ <i>Skin Tac</i> can be used to ensure adhesion with <i>Guardian</i> sensors.<sup>15</sup></li> <li>○ Medical tape can be used to ensure adhesion with <i>Dexcom</i> sensors (e.g., <i>Tegaderm</i>, <i>Skin Tac</i>, <i>3M</i> tape).<sup>39</sup></li> </ul> </li> </ul>

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Topic/Question	Answer/Pertinent Information
<b>instructions, continued</b>	<ul style="list-style-type: none"> <li>▪ Be sure not to tape over the transmitter to ensure proper communication to the receiver.<sup>39</sup></li> <li>○ <i>FreeStyle Libre</i> sensors should not be reused if they fall off or need to be removed for any reason.<sup>4</sup> <ul style="list-style-type: none"> <li>▪ If patients struggle with adhesion, consider products to help (e.g., <i>Over-Bandage</i>, <i>Skin Tac</i>, <i>Mastisol</i>, <i>Tegaderm</i>).<sup>48</sup></li> <li>▪ New sensors should be applied on rotating sites to avoid irritation.<sup>4</sup></li> </ul> </li> <li>• To remove sensors (other than <i>Senseonics Eversense</i> sensors, as these are removed by healthcare providers), instruct patients to gently pull off like an adhesive bandage, starting at the edge.<sup>4,14,15,19,20</sup> <ul style="list-style-type: none"> <li>○ Most transmitters are reusable. Remind patients to remove transmitters from sensors.<sup>14,15,19,20</sup></li> <li>○ Sensors should be disposed of in a container appropriate for sharps and blood exposure.<sup>4,14,15,19,20</sup></li> </ul> </li> </ul>
<b>What calibration is needed with continuous glucose monitors?</b>	<ul style="list-style-type: none"> <li>• Most CGMs need to be calibrated at least every 12 hours using fingerstick blood glucose levels.<sup>1,19,20,27</sup> <ul style="list-style-type: none"> <li>○ Blood glucose levels must be between 40 and 400 mg/dL (2.2 to 22.2 mmol/L) for proper calibration.<sup>1,19,20,27</sup></li> <li>○ <i>MiniMed 530G</i> (U.S. only; discontinued, but patients may still use) should be calibrated three or four times per day.<sup>16</sup></li> </ul> </li> <li>• <i>FreeStyle Libre</i> systems<sup>a</sup> and <i>Dexcom G6</i> do <b>NOT</b> require fingerstick blood glucose level calibration.<sup>4,25,36,43</sup></li> </ul>
<b>What travel considerations are important with continuous glucose monitors?</b>	<ul style="list-style-type: none"> <li>• Sensors should not be exposed to x-ray technology. <ul style="list-style-type: none"> <li>○ It is safe for patients to go through metal detectors. However, patients should request a manual pat down or remove sensors prior to going through airport security.<sup>4,19,20,43</sup></li> <li>○ It is safe to wear the <i>Senseonics Eversense</i> sensor and transmitter when going through metal detectors at the airport.<sup>41</sup></li> </ul> </li> <li>• Remind patients to adjust the time if changing time zones.<sup>4</sup></li> </ul>
<b>How does water exposure affect continuous glucose monitoring?</b>	<ul style="list-style-type: none"> <li>• Flexibility with water exposure may be an important factor for patients to consider when selecting a CGM.</li> <li>• Sensors are water resistant to different depths and durations of time depending on the model. For example: <ul style="list-style-type: none"> <li>○ <i>FreeStyle Libre</i> sensors are water resistant in up to three feet of water (1 meter) for up to 30 minutes.<sup>1,4,25</sup></li> <li>○ <i>Dexcom G5 Mobile</i> and <i>Dexcom G6</i> sensors are water resistant in up to eight feet of water (2.4 meters) for up to 24 hours.<sup>1,43</sup></li> <li>○ <i>Senseonics Eversense</i> transmitter is water resistant in up to three feet of water (1 meter [3.2 feet]) for up to 30 minutes.<sup>41</sup></li> </ul> </li> </ul>
<b>When should continuous glucose monitors NOT be used?</b>	<ul style="list-style-type: none"> <li>• CGM is not generally recommended for use in pregnant, dialysis, or critically ill patients due to lack of safety information.<sup>4,13,16-19,25</sup></li> <li>• Sensors and the <i>Eversense</i> transmitter (not the <i>Eversense</i> sensor, as this is implanted) should be removed prior to Computed Tomography (CT) scans, Magnetic Resonance Imaging (MRI), or x-rays.<sup>4,13,16-19,41</sup></li> </ul>
<b>When are</b>	<ul style="list-style-type: none"> <li>• Even with CGM, check blood glucose using a fingerstick during the following conditions:<sup>4,14-20,25</sup></li> </ul>

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Topic/Question	Answer/Pertinent Information
glucose monitor information, continued	<p>glycemic control. Don't use GMI alone, it is still important to look for hypoglycemia.</p> <ul style="list-style-type: none"> <li>• GMI may look good, but time in range may indicate adjustments in therapy are needed to prevent significant hypoglycemia.</li> <li>○ <b>Time in range (TIR):</b> percent of readings and time measured glucose values fall within the specified target range (e.g., 70 to 180 mg/dL [3.9 to 10 mmol/L]).<sup>47</sup> TIR may be expressed as a percentage of time or in hours per day.<sup>31</sup> <ul style="list-style-type: none"> <li>▪ Aim for a TIR of 70% (correlates with an A1C of 7%) for most patients.<sup>42</sup></li> <li>▪ Aim for a TIR of 50% (correlates with an A1C of about 8%) for older or high-risk patients.<sup>31,42</sup></li> </ul> </li> <li>○ <b>Time above range (TAR):</b><sup>47</sup> percent of readings and time measured glucose values fall above 180 mg/dL (10 mmol/L). Aim for less than 25% (six hours) for most patients or &lt;50% for older or high-risk patients.<sup>42,47</sup> <ul style="list-style-type: none"> <li>▪ level one: (high)<sup>47</sup> TAR with glucose values between 181 and 250 mg/dL (10.1 to 13.9 mmol/L)</li> <li>▪ level two (very high):<sup>47</sup> TAR with glucose values above 250 mg/dL (13.9 mmol/L). Aim for less than 5% (72 minutes) for most patients or consider a goal of less than 10% for older or high-risk patients.<sup>42,47</sup></li> </ul> </li> <li>○ <b>Time below range (TBR):</b><sup>47</sup> percent of readings and time measured glucose values fall below 70 mg/dL (3.9 mmol/L). Aim for less than 4% (~1 hour) for most patients or less than 1% for older or high-risk patients.<sup>42,47</sup> <ul style="list-style-type: none"> <li>▪ level one (low):<sup>47</sup> TBR with glucose values between 54 and 69 mg/dL (3 to 3.8 mmol/L)</li> <li>▪ level two (very low):<sup>47</sup> TBR with glucose values below 54 mg/dL (3 mmol/L). Aim for less than 1% (14 minutes) for most patients and to avoid completely for older or high-risk patients.<sup>42,47</sup></li> </ul> </li> <li>○ <b>TBR</b> may be especially useful for patients who are at their goal A1C, but experience frequent low readings.<sup>31</sup> For example, changes in therapy may be needed for a patient who has an A1C of 6.8%, but who has hypoglycemia 10% of the time. However, changes in therapy may NOT be needed for a patient who has an A1C of 6.8%, but who only has hypoglycemia 1% of the time.<sup>30</sup></li> <li>• You can view an <b>example of a standardized CGM report</b> (e.g., Ambulatory Glucose Profile) at <a href="https://care.diabetesjournals.org/content/diacare/42/8/1593/F2.large.jpg">https://care.diabetesjournals.org/content/diacare/42/8/1593/F2.large.jpg</a></li> </ul>
Do any medications interfere with continuous glucose monitoring?	<ul style="list-style-type: none"> <li>• Acetaminophen may falsely raise CGM readings from <i>Dexcom G4 Platinum</i><sup>c</sup> and <i>G5 Mobile</i><sup>c</sup> and <i>Medtronic Guardian Connect</i> and their sensors.<sup>13,20,35</sup> Acetaminophen doses ≤1,000 mg every six hours do not affect <i>Dexcom G6</i> readings.<sup>13,43</sup> <ul style="list-style-type: none"> <li>○ To be on the safe side, patients should not rely on readings from the <i>Dexcom G4 Platinum</i><sup>c</sup> or <i>G5 Mobile</i><sup>c</sup> or <i>Medtronic Guardian Connect</i> if they have recently taken any product containing acetaminophen.<sup>13,35</sup></li> </ul> </li> <li>• Taking ascorbic acid (vitamin C) may falsely raise all <i>FreeStyle Libre</i> system<sup>a</sup> readings. Salicylic acid (aspirin) may falsely lower <i>FreeStyle Libre</i> and <i>FreeStyle Libre 14 day</i> system readings.<sup>4</sup></li> <li>• One small pilot study found some evidence that the following medications may interfere with accuracy of CGM readings with the <i>Dexcom 4G Platinum</i> sensors: acetaminophen, albuterol, atenolol, and lisinopril.<sup>3</sup></li> <li>• Some evidence suggests that some medications used on an inpatient basis may also interfere with accurate CGM readings (e.g., dopamine, mannitol, maltose [breakdown product from peritoneal dialysis]).<sup>23</sup></li> </ul>
Considerations	<ul style="list-style-type: none"> <li>• Use of CGM in hospitalized patients is still a work in progress.<sup>10,24</sup></li> </ul>

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Topic/Question	Answer/Pertinent Information
<b>for continuous glucose monitoring in hospitalized patients.</b>	<ul style="list-style-type: none"> <li>○ CGM is not recommended in hospitalized patients until more safety and efficacy data are available.<sup>24</sup> <ul style="list-style-type: none"> <li>▪ There is concern that some devices may not provide accurate readings with changes in pH, hematocrit levels, blood oxygen tension, and peripheral perfusion.<sup>23</sup></li> <li>▪ Studies comparing the efficacy and clinical benefits of CGM devices vs using fingerstick blood glucose monitoring have yielded mixed results.<sup>24</sup> <ul style="list-style-type: none"> <li>• Several studies have been unable to show improved glycemic control with inpatient use of CGM.<sup>24</sup></li> <li>• Some studies indicate CGM seems to improve identification of hypoglycemia in hospitalized patients.<sup>11,24</sup> This may be a time saver compared to checking fingerstick blood glucose values.</li> </ul> </li> </ul> </li> <li>○ Check to see if your hospital has a policy for handling patients who would like to continue to use their personal CGM while in the hospital.<sup>29</sup> <ul style="list-style-type: none"> <li>▪ If use is allowed, consider requiring a waiver to ensure hospital glucose monitoring devices are used to validate glucose values before making treatment decisions.</li> <li>▪ Work with patients to properly remove and replace sensors as needed. Most CGMs have reusable transmitters. Remove transmitters from sensors to avoid accidental disposal.<sup>14,15,19,20</sup> <ul style="list-style-type: none"> <li>• Sensors should be disposed of in an approved sharps container.<sup>4,14,15,19,20</sup></li> </ul> </li> </ul> </li> </ul>
<b>What are the costs associated with continuous glucose monitoring?</b>	<ul style="list-style-type: none"> <li>• Costs for CGM equipment and supplies will vary among manufacturers.</li> <li>• Patients should check with their specific insurance carrier to ask about coverage.</li> <li>• Medicare and insurance coverage are becoming more common as newer CGMs are approved to be used to adjust diabetes medications without patients needing to get additional glucose values. <ul style="list-style-type: none"> <li>○ For example, Medicare Part B covers CGMs approved to be used in place of blood sugar monitors for treatment decisions.<sup>7,21,22</sup> Medicaid coverage will vary by state.</li> <li>○ In Canada, most private insurers cover the <i>FreeStyle Libre</i>.<sup>25</sup></li> </ul> </li> </ul>
<b>What billing codes should be used with continuous glucose monitors?</b>	<ul style="list-style-type: none"> <li>• In the U.S., use the following billing codes when working with CGMs:<sup>26</sup> <ul style="list-style-type: none"> <li>○ <b>Professional CGM: 95250</b> (e.g., sensor placement, hook-up, calibration, patient training, sensor removal, download) <ul style="list-style-type: none"> <li>▪ Can be completed by a healthcare professional under the direct supervision of a physician, physician assistant, or nurse practitioner. Modifier 52 should be used if the monitoring was for a duration of less than 72 hours.</li> </ul> </li> <li>○ <b>Personal CGM: 95249</b> (e.g., sensor placement, hook-up, calibration, patient training, sensor removal) <ul style="list-style-type: none"> <li>▪ Can be completed by a healthcare professional under the direct supervision of a physician, physician assistant, or nurse practitioner.</li> </ul> </li> <li>○ <b>Interpretation of CGM data: 95251</b> (personal or professional use) <ul style="list-style-type: none"> <li>▪ Physician, physician assistant, or nurse practitioner must be involved (e.g., direct involvement, co-signature) in order to comply with Medicare requirements.</li> <li>▪ Can only be used one time/month per patient.</li> </ul> </li> </ul> </li> </ul>

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- a. *FreeStyle Libre* systems include the *FreeStyle Libre* (Canada; discontinued in the U.S., but may still be in use.), *FreeStyle Libre 14 Day* (U.S. only), and *FreeStyle Libre 2* (U.S. only).<sup>49,50</sup> The *FreeStyle Libre 14 Day* (U.S. only) reader is black while the *FreeStyle Libre 2* (U.S. only) reader is blue.
- b. *Tandem T:slim X2* systems (U.S. only) include the *Tandem T:slim X2 Basal-IQ Technology* (designed to assist patients with low blood glucose levels) and *Tandem T:slim X2 Control-IQ Technology* (designed to assist patients with high and low blood glucose levels).<sup>40</sup>
- c. Dexcom stopped selling *G4 Platinum* and *G5 mobile* CGM **transmitters** in June 2020. Dexcom will stop selling *G4 Platinum* and *G5 Mobile sensors* by the end of 2020.<sup>46</sup>

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*Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.*



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## References

- Diabetes Forecast. Continuous glucose monitors: consumer guide. 2020. [http://main.diabetes.org/dforg/pdfs/2020/2020-cg-continuous-glucose-monitors.pdf?utm\\_source=Offline&utm\\_medium=Print&utm\\_content=cgms&utm\\_campaign=DF&s\\_src=vanity&s\\_subsrc=cgms](http://main.diabetes.org/dforg/pdfs/2020/2020-cg-continuous-glucose-monitors.pdf?utm_source=Offline&utm_medium=Print&utm_content=cgms&utm_campaign=DF&s_src=vanity&s_subsrc=cgms). (Accessed July 2, 2020).
- Shifflett T. Continuous glucose monitoring: everything you need to know. Updated June 4, 2020. <https://www.thediabetescouncil.com/continuous-glucose-monitoring-everything-you-need-to-know/>. (Accessed July 2, 2020).
- Basu A, Slama MQ, Nicholson WT, et al. Continuous glucose monitor interference with commonly prescribed medications: a pilot study. *J Diabetes Sci Technol* 2017;11:936-41.
- FreeStyle Libre 14-day* user manual. Updated August 2018. [https://freestyleserver.com/Payloads/IFU/2018/ART39764-001\\_rev-A-Web.pdf](https://freestyleserver.com/Payloads/IFU/2018/ART39764-001_rev-A-Web.pdf). (Accessed July 6, 2020).
- Cengiz E, Tamborlane WV. A tale of two compartments: interstitial versus blood glucose monitoring. *Diabetes Technol Ther* 2009;11:S11-6.
- Dexcom. With Health Canada approval, *Dexcom G5 Mobile* CGM system is the first medical device in North America for making daily diabetes decisions without painful fingersticks. November 14, 2016. <https://www.dexcom.com/news/health-canada-dexcom-g5-mobile-approval>. (Accessed July 6, 2020).
- Medicare. Medicare coverage of diabetes supplies, services, & prevention programs. December 2019. <https://www.medicare.gov/Pubs/pdf/11022-Medicare-Diabetes-Coverage.pdf>. (Accessed July 6, 2020).
- FDA. FDA expands indication for continuous glucose monitoring system, first to replace fingerstick testing for diabetes treatment decisions. December 20, 2016. <https://www.fda.gov/news-events/press-announcements/fda-expands-indication-continuous-glucose-monitoring-system-first-replace-fingerstick-testing>. (Accessed July 2, 2020).
- FDA. FDA approves first continuous glucose monitoring system for adults not requiring blood sample calibration. September 27, 2017. <https://www.fda.gov/news-events/press-announcements/fda-approves-first-continuous-glucose-monitoring-system-adults-not-requiring-blood-sample>. (Accessed July 2, 2020).
- Rodbard D. Continuous glucose monitoring: a review of recent studies demonstrating improved glycemic outcomes. *Diabetes Technol Ther* 2017;19:S25-37.
- Wang M, Singh LG, Spanakis EK. Advancing the use of CGM devices in a non-ICU setting. *J Diab Sci Technol* 2019;13:674-81.
- Fonseca VA, Grunberger G, Anhalt H, et al. Continuous glucose monitoring: a consensus conference of the American Association of Clinical Endocrinologists and American College of Endocrinology. *Endocr Pract* 2016;22:1008-21.
- Dexcom. Safety information. <https://www.dexcom.com/safety-information>. (Accessed July 2, 2020).
- Enlite* glucose sensor user guide. March 31, 2014. [https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/Mp6025676-2AF1\\_a\\_pdf.pdf](https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/Mp6025676-2AF1_a_pdf.pdf). (Accessed July 6, 2020).
- Guardian Sensor (3)* user guide. June 2018. <https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/Guardian%20Sensor%203%20User%20Guide%20-%20June-%202018.pdf>. (Accessed July 6, 2020).
- MiniMed 530G* system user guide. March 2018. [https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/z10-mp6025813-014-000-a--mp6025813-014\\_a.pdf](https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/z10-mp6025813-014-000-a--mp6025813-014_a.pdf). (Accessed July 2, 2020).
- MiniMed 630G* system user guide. March 2018. <https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/MiniMed%20630G%20System%20User%20Guide%20-%202020-Mar-2018.pdf>. (Accessed July 2, 2020).
- MiniMed 670G* system user guide. December 2017. <https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/MiniMed-670G-System-User-Guide.pdf>. (Accessed July 2, 2020).
- Dexcom G4 Platinum* continuous glucose monitoring system receiver with share user's guide. <https://dexcompdf.s3-us-west-2.amazonaws.com/Dexcom-G4-PLATINUM-Share-User-Guide.pdf>. (Accessed July 6, 2020).
- Dexcom G5 Mobile* continuous glucose monitoring system user guide. <https://s3-us-west-2.amazonaws.com/dexcompdf/LBL013990-REV003-G5-Mobile-User-Guide-NA-Android-US.pdf>. (Accessed July 6, 2020).
- Dexcom. Medicare announces criteria covering *Dexcom G5 Mobile* CGM for all people with diabetes on intensive insulin therapy. March 24, 2017. <https://www.dexcom.com/news/medicare-announces-criteria-covering-dexcom-g5-mobile-cgm-for-all-people-with-diabetes-on-intensive-insulin>. (Accessed July 2, 2020).
- FreeStyle Libre*. Medicare guide. <https://www.freestylelibre.us/content/dam/adc/freestylelibreus/documents/FreeStyle%20Libre%20-%20Medicare%20Guide.pdf>. (Accessed July 6, 2020).
- Rice MJ, Coursin DB. Continuous measurement of glucose: facts and challenges. *Anesthesiology* 2012;116:199-204.

More . . .

24. American Diabetes Association. Diabetes technology: standards of medical care in diabetes – 2020. *Diabetes Care* 2020;43(Suppl 1):S77-88.
25. FreeStyle. *FreeStyle Libre*. <https://myfreestyle.ca/en/products/libre>. (Accessed July 6, 2020).
26. American Association of Clinical Endocrinologists. CPT codes 95249, 95250, and 95251. <https://www.aace.com/practice-management/cpt-codes-95249-95250-and-95251>. (Accessed July 2, 2020).
27. Dexcom G4 continuous glucose monitoring quick start guide. <https://s3-us-west-2.amazonaws.com/dexcompdf/LBL-011798+Rev+02+Quick+Start+Guide%2C+G4+PLATINUM+OUS+English+mmol.pdf>. (Accessed July 2, 2020).
28. Ceriello A, Monnier L, Owens D. Glycaemic variability in diabetes: clinical and therapeutic implications. *Lancet Diabetes Endocrinol* 2019;7:221-30.
29. Wallia A, Umpierrez GE, Rushakoff RJ, et al. Consensus statement on inpatient use of continuous glucose monitoring. *J Diabetes Sci Technol* 2017;11:1036-44.
30. 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;41:2275-80.
31. Wright LA, Hirsch IB. Metrics beyond hemoglobin A1C in diabetes management: time in range, hypoglycemia, and other parameters. *Diabetes Technol Ther* 2017;19(S2):S16-26.
32. *FreeStyle Libre*. *FreeStyle Libre* portfolio. <https://www.freestylelibre.us/system-overview/continuous-glucose-monitor-app.html>. (Accessed July 2, 2020).
33. Dexcom. Dexcom products: professional CGM. <https://provider.dexcom.com/products/professional-cgm>. (Accessed July 2, 2020).
34. Lu B, Goldman JD. Glucose variability and the use of continuous glucose monitors in people with type 1 and type 2 diabetes. *AADE in Practice* 2018;6:22-5.
35. *Guardian Connect* system user guide. <https://www.medtronicdiabetes.com/sites/default/files/library/download-library/user-guides/GuardianT%20Connect%20CGM%20System%20User%20Guide.PDF>. (Accessed July 2, 2020).
36. Dexcom. *Dexcom G6* continuous glucose monitoring system user guide. March 2020. <https://s3-us-west-2.amazonaws.com/dexcompdf/G6-CGM-Users-Guide.pdf>. (Accessed July 2, 2020).
37. Dexcom. *Dexcom G4 Platinum Pediatric* continuous glucose monitoring system user's guide. [https://www.dexcom.com/sites/dexcom.com/files/user-guides/dexcom-g4-platinum-pediatric-ifu\\_1.pdf](https://www.dexcom.com/sites/dexcom.com/files/user-guides/dexcom-g4-platinum-pediatric-ifu_1.pdf). (Accessed July 2, 2020).
38. Tandem. *T:slim X2* insulin pump with Control-IQ technology user guide. June 2020. [https://www.tandemdiabetes.com/docs/default-source/product-documents/t-slim-x2-insulin-pump/aw-1004379\\_d\\_user-guide-tslim-x2-control-iq-7-3-mgd-artwork-web.pdf?sfvrsn=18a507d7\\_28](https://www.tandemdiabetes.com/docs/default-source/product-documents/t-slim-x2-insulin-pump/aw-1004379_d_user-guide-tslim-x2-control-iq-7-3-mgd-artwork-web.pdf?sfvrsn=18a507d7_28). (Accessed July 6, 2020).
39. Dexcom. How do I tape my sensor if it is falling off? <https://www.dexcom.com/faq/how-do-i-tape-my-sensor-if-it-falling-0>. (Accessed July 6, 2020).
40. Tandem Diabetes Care. <https://www.tandemdiabetes.com/>. (Accessed July 2, 2020).
41. *Eversense* user guide. [https://resources.eversenseddiabetes.com/sites/resources/files/2020-05/LBL-1632-01-001%20Rev%20E\\_Eversense%20User%20Guide\\_mgdL\\_R1.pdf](https://resources.eversenseddiabetes.com/sites/resources/files/2020-05/LBL-1632-01-001%20Rev%20E_Eversense%20User%20Guide_mgdL_R1.pdf). (Accessed July 2, 2020).
42. 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;42:1593-1603.
43. Dexcom. *Dexcom G6*: using your G6. March 2020. <https://s3-us-west-2.amazonaws.com/dexcompdf/Downloads+and+Guides+Updates/LBL016368+G6+Using+Your+G6+Guide+Canada.pdf>. (Accessed July 6, 2020).
44. *FreeStyle Libre*. Frequently asked questions about the *FreeStyle Libre* 14 day system. June 2020. <https://www.freestylelibre.us/support/faq.html#faqTabs>. (Accessed July 6, 2020).
45. Tandem. *T:slim X2* insulin pump with Basal-IQ technology user guide. January 2020. [https://www.tandemdiabetes.com/docs/default-source/product-documents/t-slim-x2-insulin-pump/aw-1004379\\_d\\_user-guide-tslim-x2-control-iq-7-3-mgd-artwork-web.pdf?sfvrsn=18a507d7\\_28](https://www.tandemdiabetes.com/docs/default-source/product-documents/t-slim-x2-insulin-pump/aw-1004379_d_user-guide-tslim-x2-control-iq-7-3-mgd-artwork-web.pdf?sfvrsn=18a507d7_28). (Accessed July 6, 2020).
46. Diatribe. Dexcom will discontinue G4 and G5 CGM systems in the United States. April 14, 2020. <https://diatribe.org/dexcom-will-discontinue-g4-and-g5-cgm-systems-united-states#:~:text=In%20June%20of%202020%2C%20Dexcom,and%20G5%20Mobile%20CGM%20sensors>. (Accessed July 6, 2020).
47. American Diabetes Association. Glycemic targets: standards of medical care in diabetes – 2020. *Diabetes Care* 2020;43(Suppl 1):S66-76.
48. *FreeStyle Libre 14 Day* system. Sensor application & adhesion guide. September 2019. <https://www.freestylelibre.us/content/dam/adc/freestylelibreus/documents/fourteendaytrial/FreeStyle%20Libre%2014%20day%20-%20Sensor%20Adhesion%20Guide.pdf>. (Accessed August 12, 2020).
49. *FreeStyle Libre*. Coming soon: discover the new *FreeStyle Libre 2* system. <https://www.freestylelibre.us/system-overview/freestyle-libre-2.html>. (Accessed July 14, 2020).
50. *FreeStyle Libre*. *FreeStyle Libre 2* flash glucose monitoring system user's manual. June 2020. [https://freestyleserver.com/Payloads/IFU/2020/q2/AR T40703-001\\_rev-D-Web.pdf](https://freestyleserver.com/Payloads/IFU/2020/q2/AR T40703-001_rev-D-Web.pdf). (Accessed August 5, 2020).

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