



Continuous Glucose Monitoring

Blood glucose testing is an important part of diabetes care because it helps individuals with diabetes manage their condition and prevent complications. Blood glucose testing provides useful information that can help identify high or low blood sugar levels, determine the effectiveness of any prescribed medication, and track progress in reaching overall treatment goals. Advances in technology have greatly improved blood glucose monitoring for patients with type 1 and type 2 diabetes. The continuous glucose monitoring (CGM) system provides more personalized care and gives patients a better understanding of how their blood sugar levels are impacted in their daily living.

Blood sugar monitoring tests have been around for nearly 100 years and have evolved considerably through medical technology advances. The finger-stick device is the most well-known type of glucose monitoring test for individuals with diabetes. It requires a person to stick their finger with a sharp needle to extract blood and place it on a paper testing strip. While this type of testing device provides the greatest accuracy for blood sugar levels at that precise moment, there are factors that can affect a person's reading, such as damaged test strips, an insufficient blood sample, and the amount of red blood cells in the blood.

The continuous glucose monitoring system was designed to help people with diabetes measure their blood glucose levels more often with fewer finger sticks. The CGM works through a tiny sensor inserted under the skin, usually on the

abdomen or arm. The sensor measures a person's glucose level through the fluid in their skin every few minutes, and a transmitter wirelessly sends the information to a monitor, which records glucose levels 24 hours a day. The device will emit an alarm if glucose levels are too low or too high. Patients can also view their glucose level anytime, allowing them to observe how their glucose changes over periods of time to recognize trends and help them to make informed decisions throughout the day about balancing food, physical activity, and medicine.

CGMs provide many benefits for diabetes management. Studies show that these devices are among the best options for outpatient blood sugar management and reducing A1C, which is considered the gold standard test for blood glucose management. CGMs also help to increase a patient's overall percentage of time spent in a healthy glucose range.

There are currently four CGM systems on the market that are approved by the Food and Drug Administration. Each stand-alone system uses a wireless transmitter to send glucose readings to a monitor for immediate results. The monitor may also be connected to a patient's smart phone if they desire. A prescription is required for a CGM system. The cost and operation for each device

varies, and most major insurance companies require a prior authorization for coverage. Patients should consult with their physician about which CGM would be best for them and check with their insurance carrier to determine coverage.



Patient Story – Gabriel Denman

Eight year-old, Gabriel (Gabe) Denman enjoys playing outdoors and being a big brother to 4 year-old, Laynne. His parents, Caleb and Ashlee, are proud of his strength and positive attitude as he manages his type 1 diabetes – a diagnosis he has lived with since he was 3 years old. In the months before his diagnosis, his parents had noticed he was often thirsty and was not gaining weight as he should. Caleb and Ashlee were employed as Emergency Department (ED) nurses at the time and were aware that Gabe might be experiencing a medical issue. As they monitored his health, Ashlee suspected Gabe was having trouble with his blood sugar levels.

“I had been giving him juice. He would finish a cup and then immediately ask for another. After giving him what seemed like the hundredth cup of juice, he was weak and appeared sickly,” Ashlee remembered. “My mother-in-law monitors her blood sugar, so we took Gabe to her house and used her glucose meter. His blood sugar was extremely high, so we immediately went to the Licking Memorial Hospital (LMH) ED.”

After staff members stabilized Gabe with intravenous fluids, he was transferred to Nationwide Children’s Hospital for further stabilization and care. The couple was told he did indeed have type 1 diabetes – an autoimmune disease where the pancreas stops producing insulin – a hormone created by the pancreas that controls the amount of glucose in your bloodstream at any given moment. The onset of type 1 diabetes is not connected to diet or lifestyle, and the exact cause is

unknown. However, researchers have found that in most people with type 1 diabetes, the body’s immune system which normally fights harmful bacteria and viruses – mistakenly destroys islet cells that produce insulin in the pancreas. Once the islet cells of the pancreas are destroyed, the body produces little or no insulin.

Insulin moves sugar (glucose) from the bloodstream to the body’s cells for energy. Sugar enters the bloodstream when food is digested. Without enough insulin, sugar builds up in the bloodstream and can cause life-threatening complications if left untreated. Right now, no cure exists, but type 1 diabetes can be managed. Advances in blood sugar monitoring and insulin delivery have improved blood sugar management and quality of life for children with the disease.

“At first it was overwhelming. We thought about Gabe’s future. For his entire life, he will always have to count carbohydrates, monitor his blood sugar, and take insulin,” Ashlee shared. “He quickly adapted though and has learned when to eat or drink something to level out his blood sugar. Also, new technologies have really been beneficial for his care.”

With a continuous glucose monitor (CGM) and tracking application, Caleb and Ashlee receive alerts on their phones when Gabe is experiencing a high or low that requires attention. The family also shared the app with staff members at the elementary school that Gabe attends in order for the teachers to be aware

of Gabe’s needs. The technology has made it simple to assist Gabe in battling the sugar highs and lows that he often experiences.

Until the summer of 2022, Gabe felt like he was the only child who had to manage type 1 diabetes. He had never met another child with the disease. Gabe’s grandmother, Traci Lautenschleger, is employed at Licking Memorial Health Systems (LMHS) as a registration specialist. She told Ashlee about LMHS’ Camp A1C – a free, one-day event for children, ages 7 to 12, who have diabetes.

During the camp, held at Infirmary Mound Park, children participate in a number of physical activities including kickball, relay races, volleyball, an inflatable obstacle course, a scavenger hunt, and water games. The children are also encouraged to make a craft, learn more about diet and exercise, and spend time with other children who also monitor and manage their blood sugar. LMH Community Case Management staff members including nurses and dietitians, lead the camp and closely monitor and care for the children during the activities.

“Gabe enjoyed the dinosaur theme. He made his own fossil and was so proud to show us his creation,” Ashlee said. “However, he most enjoyed meeting the other children. He was happy to spend time with children facing the same challenges he faces, and finding out – he is not the only child ever with type 1 diabetes.”

Patient Story – Gabriel Denman (continued on back page)



Diabetes Care – How do we compare?

At Licking Memorial Health Systems (LMHS), we take pride in the care we provide. To monitor the quality of that care, we track specific quality measures and compare to benchmark measures. Then, we publish the information so you can draw your own conclusions regarding your healthcare choices.

1. Much of the care that patients with diabetes receive takes place in the outpatient or physician office setting. The physician offices of Licking Memorial Health Professionals (LMHP) measure the most critical indicators for diabetes care.

| | LMHP 2019 | LMHP 2020 | LMHP 2021 | National |
|--|-----------|-----------|-----------|---------------------------|
| LMHP patients with diabetes having HbA1C test | 95% | 91%* | 86%* | 88% ⁽¹⁾ |
| LMHP patients with diabetes receiving eye exam | 74% | 63%* | 41%* | 58% ⁽¹⁾ |
| LMHP patients with diabetes having foot exam | 86% | 73%* | 47%* | 80% ⁽²⁾ |
| | | | | LMHP Goal |
| LMHP patients with diabetes having lipid profile | 90% | 85%* | 84%* | 90% |
| LMHP patients with diabetes having microalbuminuria test | 86% | 79%* | 64%* | 85% |

2. The hemoglobin A1C (HbA1C) test is a simple lab test that shows the average amount of sugar (also called glucose) that has been in a person's blood over an extended period of time. While having the testing done is important, the test results (or outcomes) indicate how well the physician, in collaboration with the patient, is managing the diabetes. While the goal for most people with diabetes is 7% or less, anything less than 8% is considered a good degree of control of blood sugar levels.

| | LMHP 2019 | LMHP 2020 | LMHP 2021 | National ⁽¹⁾ |
|---|-----------|-----------|-----------|-------------------------|
| LMHP patients with diabetes with HbA1C less than or equal to 7% | 55% | 47%* | 43%* | 38% |
| LMHP patients with diabetes with HbA1C less than or equal to 8% | 76% | 69%* | 63%* | 59% |

3. People with diabetes are at high risk for heart disease. An elevated LDL ("bad") cholesterol test reveals if an individual has unhealthy fat levels, which increase the risk for heart disease – a very serious complication of diabetes. An LDL level of 100 milligrams per deciliter (mg/dL) or less is considered best for heart health.

| | LMHP 2019 | LMHP 2020 | LMHP 2021 | National ⁽¹⁾ |
|--|-----------|-----------|-----------|-------------------------|
| LMHP patients with diabetes with LDL less than or equal to 100 mg/dL | 75% | 74%* | 71%* | 48% |

4. The Community Case Management (CCM) program at Licking Memorial Hospital (LMH) provides services to people with diabetes in the community including the Diabetes Self-Management Education & Support program. The American Diabetes Association recommends that a person with diabetes should have an HbA1C blood test at least every six months to monitor glucose levels. LMH staff members work closely with patients and their physicians to ensure that this test is performed as recommended in order to manage each patient's condition better.

| | LMH 2019 | LMH 2020 | LMH 2021 | LMH Goal |
|--|----------|----------|----------|-------------------------|
| Diabetes Self-management Education & Support participants who obtained an HbA1C test | 100% | 100% | 100% | Greater than 85% |

5. A1C is the standard for measuring blood sugar management in people with diabetes. Studies show higher A1C levels to be associated with the risk of certain diabetes complications (eye, kidney and nerve disease). For every one percent decrease in A1C, there is significant protection against those complications.

| | LMH 2019 | LMH 2020 | LMH 2021 | LMH Goal |
|---|----------|----------|----------|-------------------------|
| Diabetes Self-management Education & Support participants with a decrease HbA1C or within normal limits | 84% | 79% | 78% | greater than 80% |

*Due to COVID-19 restrictions throughout 2020 and 2021, some patients were unable to obtain regular testing or attend in-person appointments.

Data Footnotes:

- (1) Average of reported Commercial, Medicare and Medicaid/HEDIS measures.
- (2) National Committee for Quality Assurance – NCQA Diabetic Recognition Program

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Signs of type 1 diabetes can begin to appear early; however, it may take time to recognize the symptoms. It is important to pay close attention to the signs in children. Experiencing frequent urination may be a sign that the kidneys are trying to expel excess sugar from the blood. The resulting dehydration may then cause extreme thirst, and the lack of available fluids may also cause dry mouth and itchy skin. If your child experiences increased

hunger or unexpected weight loss, they might not be receiving adequate energy from the food they consume.

“Do not be afraid to check your child’s blood sugar levels. Be suspicious of extreme thirst and the other signs of diabetes,” Ashlee warns. “A type 1 diagnosis is not as scary or overwhelming as it seems. Diabetes is manageable and

children adapt well once they understand what they need to do.”

LMHS hosts Camp A1C annually in July. The event is free and open to children ages, 7 to 12, who are under a physician’s care for diabetes. To find out more about the Camp, visit LMHealth.org.

Important Health Exams for Diabetes Care

Diabetes is a chronic health condition that affects how a person’s body uses glucose – an important source of energy for cells in the body. Too much sugar in a person’s blood can lead to other serious health conditions, such as heart, kidney, and eye disease. It is important for people with diabetes to maintain regular health checks to ensure their blood sugar, cholesterol, and blood pressure levels are within a healthy range, and to detect any potential complications. Important exams and tests include:

A1C test – a blood test that measures the average blood sugar levels over a period of two to three months and shows how well a person’s blood sugar is controlled. For most patients, an A1C result that is at or below 7 percent is good. Patients can have this tested as often as every three months.

Albumin-to-creatinine ratio (ACR) – this test measures the amount of albumin – a type of protein – in the urine. Too

much of this protein can be a sign of kidney damage. The ACR test should be performed annually to prevent or slow the progression of kidney disease.

Blood pressure – a person with diabetes has a higher risk of high blood pressure, which can increase the risk of a heart attack or stroke. Blood pressure should be checked regularly.

Ankle-brachial index – patients who have symptoms of peripheral artery disease (PAD) will have a blood pressure reading taken at their ankle. The results are compared with their regular blood pressure reading to screen for PAD.

Cholesterol – having diabetes increases a person’s risk of heart disease. Patients should check their cholesterol levels at least once a year as part of their wellness exam.

Foot exam – according to the American Podiatric Medical Association, half of

people with diabetes will lose feeling in their feet and lower extremities. A complete foot exam includes a check for reflexes, calluses, infections, sores, and loss of feeling. This exam should be performed at every office visit.

Eye exam – an ophthalmologist will dilate the eyes to check for damage of the blood vessels in the eyes. The exam should also include a check for early signs of glaucoma, cataracts, and diabetic retinopathy.

Many of these exams can be performed by a primary care physician; however, it is important for patients with diabetes to build a healthcare team, which may include a certified diabetes care and education specialist, pharmacist, dietitian, ophthalmologist, dentist, and podiatrist. Other specialists, such as a nephrologist for kidney care, and dermatologist, may also be a part of the healthcare team.



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Visit us at LMHealth.org.

Please take a few minutes to read this month’s report on **Diabetes Care**. You will soon discover why Licking Memorial Health Systems is measurably different ... for your health!

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