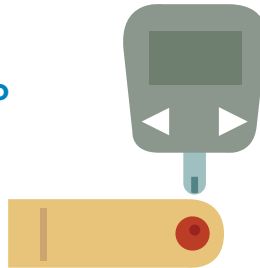




Blood Glucose Monitoring

Ongoing patient self-management education and support are critical to preventing acute complications and reducing the risk of long-term complications in Patients With Diabetes (PWD).



The American Diabetes Association (ADA) Standards of Medical Care are intended to provide clinicians, patients, and other interested individuals with the components of diabetes care, general treatment goals, and tools to evaluate the quality of care.

The Assessment of Glycemic Control section of the ADA Standards of Care describes two primary techniques that are available for health providers and patients to assess the effectiveness of the management plan on glycemic control: patient self-monitoring of blood glucose (SMBG), and A1C. Continuous Glucose Monitoring (CGM) devices are also an option for patients, but these devices are still not approved by the US Food and Drug Administration as the sole agent to monitor glucose.

The Standards of Medical Care states that “SMBG allows patients to evaluate their individual response to therapy and assess whether glycemic targets are being achieved. Results of SMBG can be useful in preventing hypoglycemia and adjusting medications (particularly prandial insulin doses), medical nutrition therapy, and physical activity. Evidence also supports a correlation between SMBG frequency and lower A1C¹.”

Furthermore, it states that “SMBG frequency and timing should be dictated by the patient’s specific needs and goals. SMBG is especially important for patients treated with insulin to monitor for and prevent asymptomatic hypoglycemia and hyperglycemia.”

Miller, KM, Beck, RW, Bergenstal, RM, et al. Evidence of a Strong Association Between Frequency of Self-Monitoring of Blood Glucose and Hemoglobin A1C Levels in T1D Exchange Clinic Registry Participants. *Diabetes Care*. 2013;36(7):2009-2014. doi:10.2337/dc12-1770.

American Diabetes Association. Standards of Medical Care in Diabetes – 2015. *Diabetes Care*. 2015; 38 (1) 1 – 99.

Other Monitoring

In addition to blood glucose, many other things can be monitored to give clinicians tools to better assess diabetes control including:

- **A1C**
establishes average blood glucose levels within the last 3 months
- **Ketones**
allows monitoring for life threatening complications (Diabetic Ketoacidosis)
- **Blood Pressure**
lipid panels and CVD (Cardio Vascular Disease) screening – monitors for complications of DM and comorbidities
- **Albumin**
allows monitoring for DM related kidney damage

American Diabetes Association. Standards of Medical Care in Diabetes – 2015. *Diabetes Care*. 2015; 38 (1) 1 – 99.



Blood Glucose Monitoring

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Importance of Monitoring

Monitoring of blood glucose is one of the key things to assessing patients' diabetes control.

- Monitoring allows both the patient and their healthcare professional to assess:
 - If medications are working well or need to be adjusted
 - If patients are following the correct dietary plan
 - If patients are adhering to medications
- Blood glucose monitoring is also important for patients to assess when to self-adjust insulin regimens (when allowed by physician plan), when to treat hypoglycemia and when to seek medical attention.
- Monitoring also allows the patient to see in real time how improving nutrition, medication adherence and exercise will improve blood glucose (BG)

American Diabetes Association. Standards of Medical Care in Diabetes – 2015. *Diabetes Care*. 2015; 38 (1) 1 – 99.





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Current Guidelines on Timing

- In 2015 the American Diabetes Association (ADA) released new guidelines for the treatment of DM.
- In 2011 the American Association of Clinical Endocrinologists (AACE) released the Medical Guidelines for Clinical Practice for Developing a Diabetes Mellitus Comprehensive Care Plan, which was updated with a simplified treatment algorithm in 2013.

American Diabetes Association. Standards of Medical Care in Diabetes – 2015. *Diabetes Care*. 2015; 38 (1) 1 – 99.

Handelsman, Y, Mechanick, JI, Blonde, L, et al. American Association of Clinical Endocrinologists Medical Guidelines for Clinical Practice for Developing a Diabetes Mellitus Comprehensive Care Plan. *Endocrine Practice*. 2011;17(s2):1-53. doi:10.4158/EP.17.S2.1.

ADA recommendations:

Recommended blood glucose testing timing for all patients using multiple-dose insulin and beneficial for all other patients

- Before meals or snacks
- “Occasionally postprandially”
- At bedtime
- Before exercise
- When experiencing hypoglycemia symptoms or when treating hypoglycemia
- Before “critical tasks” (e.g driving, exercising, etc.)

American Diabetes Association. Standards of Medical Care in Diabetes – 2015. *Diabetes Care*. 2015; 38 (1) 1 – 99..

AACE recommendations:

Recommended blood glucose testing timing for all patients using insulin, and for non-insulin DM patients.

- At least two times a day but preferably anytime before insulin administration
- Patients with symptoms, history of lack of BG control or frequent low blood glucose may need monitoring after meals or during the night

Handelsman, Y, Mechanick, JI, Blonde, L, et al. American Association of Clinical Endocrinologists Medical Guidelines for Clinical Practice for Developing a Diabetes Mellitus Comprehensive Care Plan. *Endocrine Practice*. 2011;17(s2):1-53. doi:10.4158/EP.17.S2.1.

World Diabetes Day is celebrated on November 14th to mark the birthday of Frederick Banting who, along with Charles Best, was instrumental in the discovery of insulin in 1922, a life-saving treatment for diabetes patients.

did you know?

Each year, the American Diabetes Association (ADA) releases new diabetes treatment guidelines, the American Diabetes Association Standards of Medical Care.





Blood Glucose Monitoring

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Blood Glucose Patient Goals:

Glycemic Index Recommendations for Adults (Non-Pregnant)

A1C	<7.0%
Preprandial capillary plasma glucose	80-130 mg/dL (3.9-7.2 mmol/L)
Peak postprandial capillary plasma glucose	<180 mg/dL (<10.0 mmol/L)

- Glycemic goals in pediatrics are generally less strict due to potential for hypoglycemic unawareness and growth needs.
- In patients without severe hypoglycemia, tighter goals may be considered.
- Continuous glucose monitoring (CGM) combined with a structured intensive insulin regimen can lower A1C in adults (greater than age 25) with type 1 diabetes.
- Lowering of A1C through CGM and an insulin therapy may also be helpful with children, teens and younger adults.
- CGM can also be used as a supplemental tool with self monitoring blood glucose, especially for patients with hypoglycemic unawareness and/or frequent hypoglycemic episodes.

American Diabetes Association. Standards of Medical Care in Diabetes – 2015. *Diabetes Care*. 2015; 38 (1) 1 – 99.



Contour® Next Blood Glucose Meter



Blood Glucose Monitoring

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Paired Testing

Market research suggests that over 19 MM people with diabetes check their blood glucose (Roper 2013). While the number of testers has increased, the frequency of testing has declined. Along with other reasons for the decline, many patients with diabetes don't understand their numbers or don't know what to do with the BG results they get.

Some people see their blood glucose numbers as moving up and down for no reason, while others think of their numbers as a grade on a test or a judgment of how well they have done with their meal plan and exercise routine. It's easy for people with diabetes to skip testing when they don't understand or want to know the results.

Paired Testing is a relatively new approach to BG testing. Paired Testing means patients test their blood glucose level twice—before and again after a meal or activity—and compare the numbers. When they compare the pair of numbers, they can see how their decisions or actions affect their blood glucose level, and can see what they can do to improve. Paired Testing can help them make informed and wise decisions, which, in turn, may help them feel more confident and in charge of their diabetes.

The paired testing approach can help answer important questions, such as:

- Why their blood glucose level may be going up and down
- How their moods may be related to blood glucose level
- Whether or not their actions are making a real difference in their diabetes care

Having your patients try Paired Testing can help them assess other important issues as well, such as:

- How stress affects their blood glucose level
- How their favorite drinks impact their blood glucose level
- Why their blood glucose level sometimes seem too high in the morning
- Whether changes in their blood glucose level affect their sleep

GfK. 2103 US Roper Diabetes Patient Study.

A meter with a meal marker and audible reminder increases post-prandial and paired testing.

Using a meal marker resulted in

- Increased understanding of how to make decisions
- Better understanding of the difference between pre-meal and post-meal results

did you know?

"Adrenal Disorders." *American Association of Clinical Endocrinologists* (2011): 1-211. Web. 22 Jan. 2015.

BEFORE



AFTER

