POCT

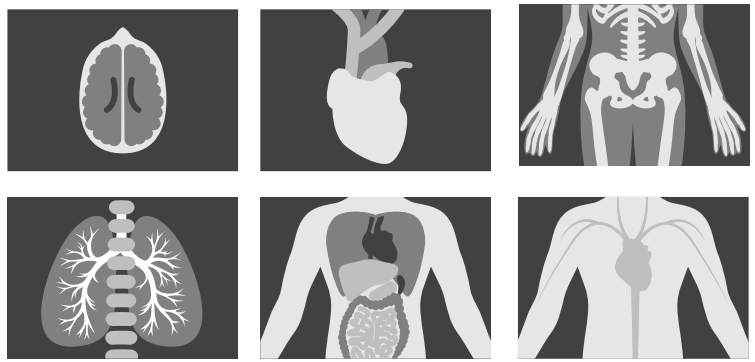
A1c POCT:
Monitor With Real-Time Data to Improve Diabetes Outcomes

POINT OF CARE TESTING UNIVERSITY

Who Needs Diabetes Monitoring?

About **1 in 10** U.S. adults have diabetes.

- Chronic condition in which the body does not produce enough insulin (type 1) or when the body cannot effectively use the insulin it produces (type 2).
- Up to 95% of diabetes diagnoses are type 2 diabetes.



Multiple organ systems are affected.

- **Monitoring** diagnosed and at-risk individuals can improve outcomes and prevent long-term complications.
- Type 2 diabetes is frequently found in adults but can occur at any age.
  - > 5,000 youth are diagnosed each year and the number is climbing.

Individuals at-risk for diabetes and diabetes complications….

- Diagnosed with diabetes or prediabetes
- Overweight
- Age 45+
- Family history
- Physically inactive
- History of gestational diabetes or delivered baby 9+ lbs
- Non-White ethnicity
- Non-alcoholic fatty liver disease

World Health Organization. https://www.who.int/news-room/fact-sheets/detail/diabetes. Accessed July 15, 2024.
Centers for Disease Control and Prevention. https://www.cdc.gov/diabetes/about/about-type-2-diabetes.html. Accessed July 7, 2024.

Monitoring Diabetes With A1c Can Improve Outcomes

American Diabetes Association (ADA)
recommended glycemic goal is **< 7.0% A1c** in individuals diagnosed with diabetes.

Only **1 in 4** achieve the recommended goal.

A1c represents average glycemic control over the past 2-3 months and accounts for preprandial and postprandial blood glucose levels.

Compared with glucose, A1c has lower biological variability and is not affected by stress and exercise.

Every **1%** decrease in A1c level lowers risk of complications.

Point-of-care (POCT) or in-office/near-patient A1c improves testing compliance and reduces costs.

Practices with POCT A1c are **3.7 times less likely** to have patients that miss testing

Schnell O, et al. *J Diabetes Sci Technol*. 2017 May;11(3):611-617.
Stratton IM, et al. *BMJ*. 2000;321(7258):405–412.
Lage MJ, Boye KS. *Current Medical Research and Opinion*. 2020;36(9):1441–1447.
Crocker JB, et al. *J Diabetes Sci Technol*. 2021 May;15(3):561-567.
Centers for Disease Control and Prevention. https://archive.cdc.gov/www_cdc_gov/diabetes/research/reports/diabetes-abcs.html. Accessed July 7, 2024.

American Diabetes Association (ADA)
Glycemic Assessment Frequency Recommendations

- Assess glycemic status by A1c and/or appropriate continuous glucose monitoring (CGM) at least two times a year.
- Assess more frequently (e.g., every three months) for individuals not meeting treatment goals, with frequent or severe hypoglycemia or hyperglycemia, changing health status, or growth and development in youth.
- Assess glycemic status at least quarterly and as needed in individuals whose therapy has recently changed and/or who are not meeting glycemic goals.

> “The A1c test is the primary tool for assessing glycemic status in both clinical practice and clinical trials and is strongly linked to diabetes complications.”

The use of POCT A1c testing may provide an opportunity for more timely treatment changes during encounters between individuals with diabetes and health care professionals.

American Diabetes Association Professional Practice Committee; 6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2024. Diabetes Care 1 January 2024; 47 (Supplement_1): S111–S125.

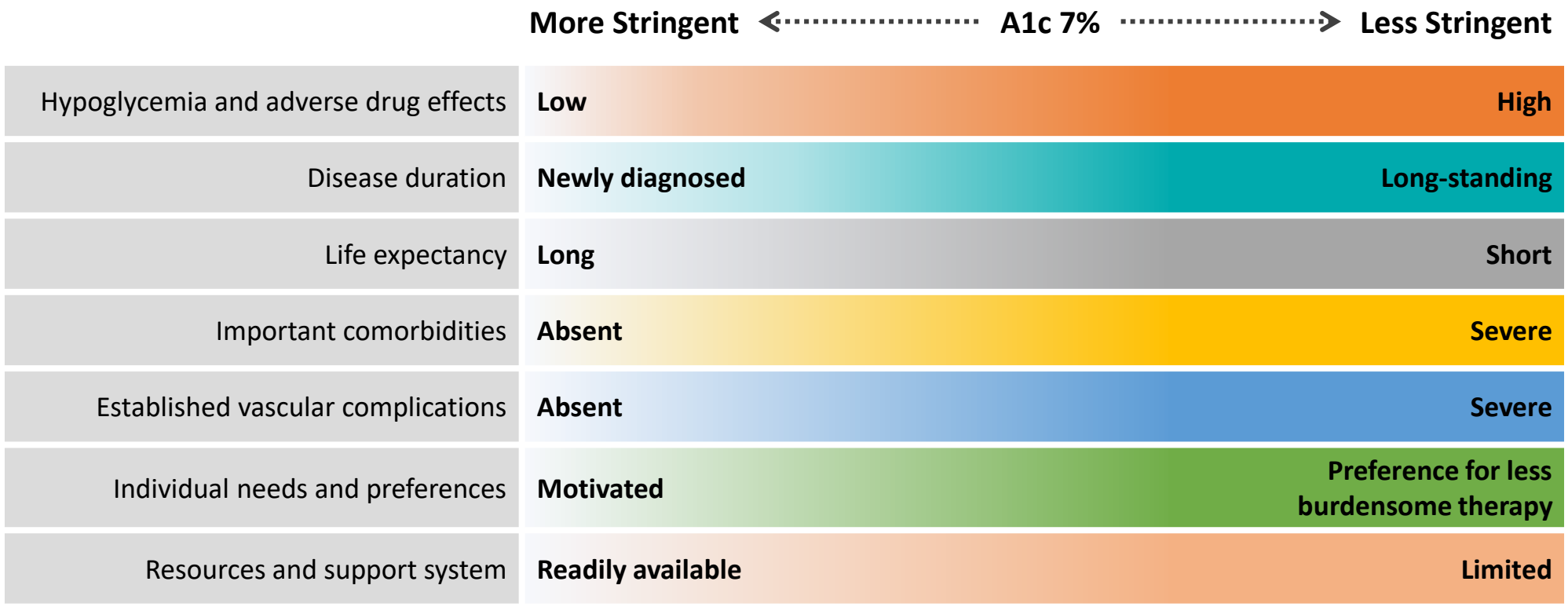
Glycemic Goals Should Be Based on Individual Patient Circumstances

ADA Recommended Glycemic Goals
A1c in non-pregnant adults of < 7%.
Achievement of lower A1c levels than the goal of 7% may be acceptable and even beneficial if it can be achieved safely and without significant hypoglycemia or other adverse treatment effects.
Less stringent glycemic goals may be appropriate for individuals with limited life expectancy or where harms of treatment are greater than benefits.
De-intensify medications for individuals who are at high risk for hypoglycemia or for whom the harms and/or burdens of treatment may be greater than the benefits, within individualized glycemic goals.
Reassess glycemic goals based on individualized criteria.
Setting a glycemic goal during consultation is likely to improve patient outcomes.

American Diabetes Association Professional Practice Committee; 6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2024. Diabetes Care 1 January 2024; 47 (Supplement_1): S111–S125.

A1c Targets Can be Individualized In Multiple Areas

POCT A1c may provide an opportunity to develop individualized glycemic targets during patient visits, eliminating the need for follow-up.

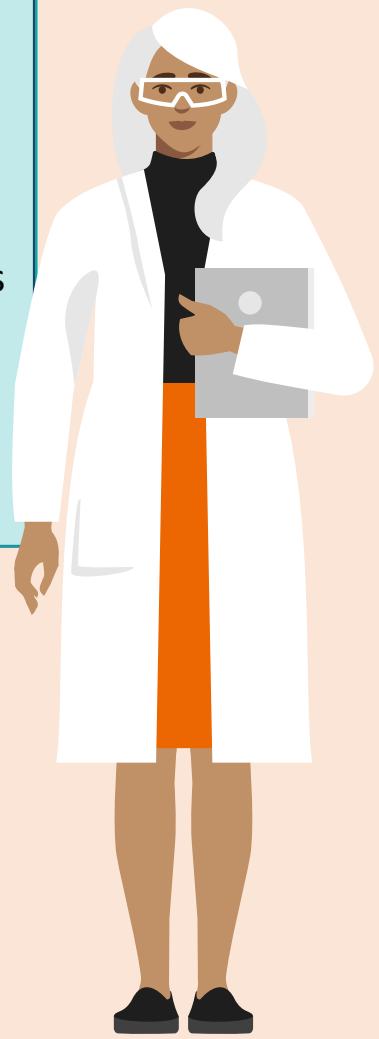


American Diabetes Association Professional Practice Committee; 6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2024. Diabetes Care 1 January 2024; 47 (Supplement_1): S111–S125.

ADA Standards of Care

For many people with diabetes, glucose monitoring, either using BGM or CGM **in addition to regular A1C testing,** can help achieve glycemic goals.

For individuals prone to glycemic variability, especially people with type 1 diabetes or type 2 diabetes with severe insulin deficiency, glycemic status is best evaluated by the **combination** of results from BGM or CGM and A1C.



Continuous Glucose Monitoring Doesn't Eliminate the Need for A1c

- A1c reflects average glycemia over 3 months while CGM or other capillary monitoring provides data over a more recent time period.
- CGM or blood glucose monitoring (BGM) by capillary device may be useful for individuals who are insulin dependent or who have substantial glycemic variability.
- Individual discrepancies in CGM and A1c values can occur.
  - Non-glycemic factors (medications, interruptions in CGM data sets, short CGM time course, device bias)
  - Glycemic factors (RBC lifespan, hemoglobin variants, transfusions)

American Diabetes Association Professional Practice Committee; 6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes—2024. Diabetes Care 1 January 2024; 47 (Supplement_1): S111–S125. Tozzo V, et al. Diabetes Care 23 February 2024; 47 (3): 460–466.

Continued Case for POCT A1c

Point-of-Care A1c testing can be utilized to improve clinical outcomes through multiple methods.

Improve access to testing

Increase testing frequency

Aid glycemic awareness and lifestyle changes

Facilitate patient engagement

Early diagnosis

Gourlay A, et al. *Prim Care Diabetes*. 2024;18(1):7-16

Patient Case: Marcus

Presentation:

A 57-year-old male patient presents at a community health fair in Chicago for health assessment and screenings.

History:

Patient reports that his last healthcare assessment was at his previous primary care provider two years ago. At this time, he was diagnosed with high blood pressure and type 2 diabetes with an A1c of 7.2%. His primary care provider advised lifestyle modifications and monitoring for both conditions.
The patient has since lost his insurance and has not been able to follow-up with recommended annual testing.

Health Assessments:

- Cardiovascular screening
- Pulmonary function screening
- BMI and sleep apnea screening
- Hearing screening
- Medication counseling

POCT Labs:

- A1c
- CBC
- PSA
- Vitamin D
- Lipid profile
- TSH

Patient Case: Marcus

POCT Lab Results

- A1c: **8.2%**
- CBC: normal range
- PSA: normal range
- Vitamin D: normal range
- Lipid profile
  - LDL: **161 mg/dL**
  - HDL: 65 mg/dL
  - Total cholesterol: **251 mg/dL**
  - Triglycerides: **237 mg/dL**
- TSH: normal range

Assessment Results

- BMI: 30
- Blood pressure: 138/84 mm Hg

Elevated A1c flagged Marcus to meet with the certified diabetes educator on-site at the community health fair.

A glycemic goals plan, diet, and lifestyle modifications were discussed, and a follow-up was scheduled at the diabetes clinic with a primary care provider.

Follow-Up Recommendations

- Metformin, statin, GLP-1 receptor agonist, SGLT-2 inhibitor
- Lifestyle modifications including dietary changes and exercise.

Key Points

1. POCT A1c was elevated compared to previous values, indicating worsening type 2 diabetes.
2. On-site POCT results allowed the diabetes educator to discuss a glycemic goals plan and treatment.
3. Patient was informed of his worsening diabetes and received education to reduce risk of future complications.