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Canada

# Targets for Glycemic Control

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# November Diabetes Awareness Month

- Every day 640 Canadians are diagnosed with diabetes or 1 person every 3 minutes.
- There is still no cure for 11.7 million people in Canada
- Diabetes is the leading cause of blindness, end stage renal disease and non-traumatic amputation in Canadian Adults.
- Targets for Glycemic Control – Chapter 8 from the 2018 Clinical Practice Guidelines.

# Glycated Hemoglobin: A1C

- Reliable measure of mean plasma glucose over 3-4 months

- Valuable indicator of treatment effectiveness

- Measure at least every 3 months when glycemic targets are not being met or treatments adjusted

- Measure every 6 months if stable at glycemic targets

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## Targets Checklist

✓ **A1C ≤7.0% for MOST people with diabetes**

✓ **A1C ≤6.5% for SOME people with type 2 diabetes**

✓ **A1C 7.1%-8.5% in people with specific features**

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# A1C Targets

| ≤6.5 | Adults with type 2 diabetes to reduce the risk of CKD and retinopathy if at low risk of hypoglycemia |
|---|---|
| ≤7.0 | **MOST ADULTS WITH TYPE 1 OR TYPE 2 DIABETES** |
| 7.1 ↓ 8.5 | **7.1-8.0%**: Functionally dependent*<br>**7.1-8.5%:**<br>• Recurrent severe hypoglycemia and/or hypoglycemia unawareness<br>• Limited life expectancy<br>• Frail elderly and/or with dementia** |
| | Avoid higher A1C to minimize risk of symptomatic hyperglycemia and acute and chronic complications |
| End of life | A1C measurement not recommended. Avoid symptomatic hyperglycemia and any hypoglycemia |

\* Based on class of antihyperglycemic medication(s) utilized and person's characteristics
\** see Diabetes in Older People chapter

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### To achieve A1C ≤7.0%

| | A1C (%) | Preprandial PG (mmol/L) | 2 hour Postprandial PG (mmol/L) |
|---|---|---|---|
| For most patients | ≤7.0 | 4.0-7.0 | 5.0-10.0 |
| If A1C ≤7.0% not achieved despite the above PG targets | | 4.0-5.5 | 5.0-8.0 |

*PG,* plasma glucose

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## Correlation between A1C and estimated mean glucose values

| A1C values (%) | 5.5–6.5 | 6.5–6.9 | 7.0–7.4 | 7.5–7.9 | 8.0–8.5 |
|---|---|---|---|---|---|
| Estimated mean glucose (mmol/L) | 6.2–7.7 | 7.8–8.5 | 8.6–9.3 | 9.4–10.1 | 10.2–10.9 |

*A1C,* glycated hemoglobin

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Moorhouse P, Rockwood K. J R Coll Physicians Edinb 2012;42:333-340.

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## Recommendations 1-3

1. Glycemic targets should be individualized [Grade D, Consensus]
2. In most people with type 1 or type 2 diabetes, an A1C ≤7.0% should be targeted to reduce the risk of microvascular [Grade A, Level 1A] and, if implemented early in the course of disease, CV complications [Grade B, Level 3]
3. In people with type 2 diabetes, an A1C ≤6.5% may be targeted to reduce the risk of CKD [Grade A, Level 1A] and retinopathy [Grade A, Level 1A], if they are assessed to be at low risk of hypoglycemia based on class of antihyperglycemic medication(s) utilized and the person's characteristics [Grade D, Consensus]

*CKD*, chronic kidney disease; *CV*, cardiovascular

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## Recommendation 4

4. A higher A1C target may be considered in people with diabetes with the goals of avoiding hypoglycemia and over-treatment related to antihyperglycemic therapy, with any of the following: [Grade D, Consensus]
   – **Functionally dependent**: 7.1-8.0%
   – History of recurrent **severe hypoglycemia**, especially if accompanied by **hypoglycemia unawareness**: 7.1-8.5%
   – **Limited life expectancy**: 7.1-8.5%
   – **Frail** elderly and/or with **dementia**: 7.1-8.5%
   – **End of life**: A1C measurement not recommended. Avoid symptomatic hyperglycemia and any hypoglycemia

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## Recommendation 5

5. In order to achieve an A1C ≤7.0%, people with diabetes should aim for:
   – **Fasting plasma glucose (FPG)** or **preprandial** PG target of **4.0–7.0** mmol/L and a **2h PPG** target of **5.0–10.0** mmol/L [Grade B, Level 2 for type 1; Grade B, Level 2 for type 2 diabetes]
   – If an **A1C target ≤7.0% cannot be achieved** with a FPG target of 4.0-7.0 mmol/L and PPG target of 5.0–10.0 mmol/L, further **FPG lowering to 4.0 to 5.5** mmol/L and/or **PPG lowering to 5.0–8.0** mmol/L may be considered, but must be balanced against the risk of hypoglycemia [Grade D, Level 4 for FPG target for type 2 diabetes; Grade D, Consensus for FPG target for type 1 diabetes; Grade D, Level 4 for PPG target for type 2 diabetes; Grade D, Consensus for PPG target for type 1 diabetes]

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## Key Messages

- Optimal glycemic control is fundamental to the management of diabetes
- Both fasting and postprandial plasma glucose levels correlate with the risk of complications and contribute to the measured A1C value
- Glycemic targets should be individualized based on the individual's age, duration of diabetes, risk of severe hypoglycemia, presence or absence of hypoglycemia unawareness, frailty or functional dependence and life expectancy

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