

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

Targets Checklist

- ✓ **A1C \leq 7.0% for MOST people with diabetes**
- ✓ **A1C \leq 6.5% for SOME people with type 2 diabetes**
- ✓ **A1C 7.1%-8.5% in people with specific features**

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* 7.1-8.5%: <ul style="list-style-type: none"> Recurrent severe hypoglycemia and/or hypoglycemia unawareness Limited life expectancy 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

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

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, glyated hemoglobin

Clinical Frailty Scale



1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



7 Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).



2 Well – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.



8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.



3 Managing Well – People whose medical problems are well controlled, but are not regularly active beyond routine walking.



9 Terminally Ill – Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.



4 Vulnerable – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”, and/or being tired during the day.



5 Mildly Frail – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.



6 Moderately Frail – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In **severe dementia**, they cannot do personal care without help.

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 $\leq 7.0\%$ 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 $\leq 6.5\%$ 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

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

Recommendation 5

5. In order to achieve an A1C $\leq 7.0\%$, 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 $\leq 7.0\%$ 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]

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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