Diabetes Guidelines for the Frail Elderly

Intended for those with severe or very severe frailty according to the Clinical Frailty Scale
The guidelines advocate for more lenient blood glucose (BG) targets with frailty and make recommendations to avoid excessive blood glucose testing.

Developed by the Diabetes Care Program of Nova Scotia [**http://cme.medicine.dal.ca/ADS.htm**] with the Palliative and Therapeutic Harmonization (PATH) Program. For a more extensive description of the rational behind the guideline: see Mallery LH. J Am Med Dir Assoc. 2013 Nov;14(11):801–8.

This guideline recommends liberal glycemic targets, by keeping blood glucose measures between 10 to 20 mmol/L and HbA1c above 8% and below 12%.

Random Blood Glucose, mmol/L (mg/dL)	Action
Less than 7 (126)	Decrease diabetes treatment
7.0 – 9.9 (126–179)	May be acceptable. There is a risk for hypoglycemia with oral diabetes agents or insulin. If there is hypoglycemia, decrease treatment.
10 – 20 (180–360)	This range is acceptable if there are no reversible symptoms
Frequently above 20 (360)	Increase treatment

HgbA1c, %	ACTION
Less than 8	Decrease diabetes treatment
8 – 12	Acceptable, if asymptomatic
More than 12	This range is acceptable if there are no reversible symptoms such as polyuria*

FREQUENCY OF TESTING

Blood Glucose (Bedside Capillary) Testing

- **On admission (with a diagnosis of diabetes) –** twice daily at alternate times for one to two weeks to establish baseline and need to adjust treatment
- **Routine/ongoing** (If BG stable and within liberalized glycemic target range)
    - On oral agents or stable doses of basal insulin without regular/rapid insulin: routine testing is usually not necessary
    - On regular/rapid insulin (meal time insulin), test once daily alternate times

A1C Testing

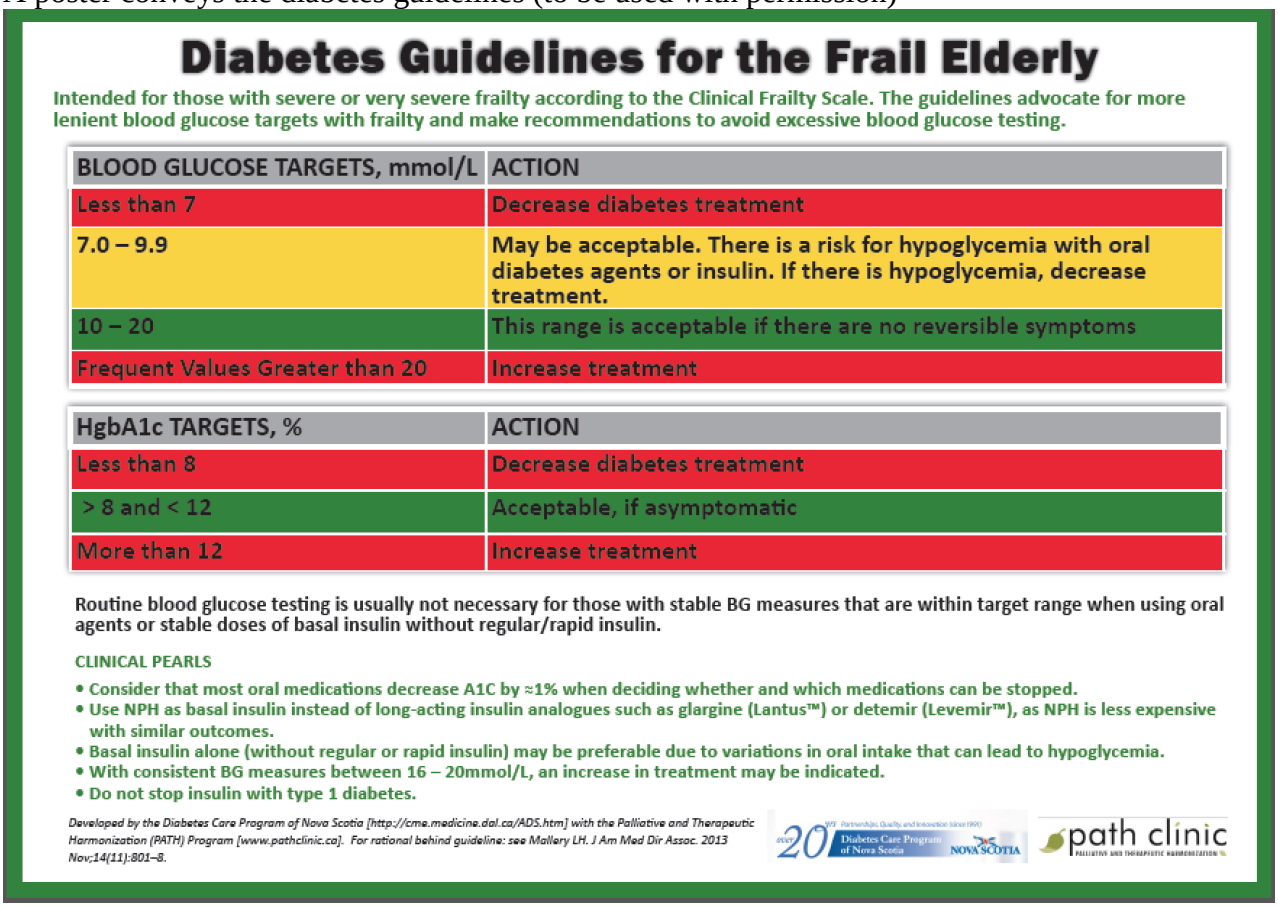
- **On admission (with a diagnosis of diabetes)** – measure once to establish baseline
- **Routine/ongoing**
    - Lifestyle modification only – not more than once/year, but may not be needed
    - Oral agents/insulin – once or twice/year

THE RATIONAL FOR THE GUIDELINE

Based on the VADT finding of no benefit when the HbA1c concentration was 6.9% compared to 8.4%, it seems unnecessary to maintain the HbA1c concentration below 8%. Thus, this guideline endorses a wide range of acceptable HbA1c targets. In this way, treatment decisions can be based on the level of frailty and tolerability of hyperglycemia and individualized treatment decisions can be made regarding whether to aim for an HbA1c concentration between 8% or 9% or higher (i.e., > 9% to < 12%). Although acceptance of high HbA1c levels near 12% may be the exception, it is unnecessary to alter therapy if an individual has tolerated high HbA1c levels for many years, limited life expectancy, and no hyperglycemia-associated symptoms.

- Older adults who are frail have shortened life expectancy and multiple co-morbidities. The Nova Scotia Department of Health and Wellness data indicates that in 2010/11, 27% of admissions had diabetes with an average length of stay of 2.5 years.[1]
- It takes at least 5 years to achieve benefit from tight control—an irrelevant timeframe with frailty [2-5]
- When there is long standing diabetes (as occurs with frailty), studies show limited benefit[3], no benefit[4] or harm[5] with tight control. [5,6]
- The demonstrated microvascular benefits in randomized controlled trials are surrogate, not clinical, outcomes that have limited relevance in frailty[2,6,7], including:
    - Decreased photocoagulation, but no difference in vision
    - Less albuminuria, but no difference in creatinine
    - Less neuropathy, based on changes in reflexes, biothesiometer readings, R-R intervals on EKG, lying and standing blood pressure measures, and self-reported erectile dysfunction
- In the Veterans Affairs Diabetes Trial,[4] there was no difference in positive outcomes or serious hyperglycemic adverse events when HbA1c was 6.9% compared to 8.4%. Therefore, a HbA1c target above 8% is reasonable. The targeted range of HbA1c (< 8 to < 12%) was chosen to allow for individualized treatment decisions based on drug tolerance and symptoms, as some frail patients may be able to tolerate higher blood glucose and HbA1c measures.
- The most consistent finding of randomized controlled trials of intensive blood glucose control has been an increased risk of hypoglycemia, which is particularly problematic for the elderly.
- Studies indicate that high HbA1c levels may be common and tolerable[4]
- There is increased hospitalization with intensive treatment.
- The cost and human resources needed to measure and maintain tight control in long-term care is significant.

A poster conveys the diabetes guidelines (to be used with permission)



Diabetes Guidelines for the Frail Elderly

Intended for those with severe or very severe frailty according to the Clinical Frailty Scale. The guidelines advocate for more lenient blood glucose targets with frailty and make recommendations to avoid excessive blood glucose testing.

BLOOD GLUCOSE TARGETS, mmol/L	ACTION
Less than 7	Decrease diabetes treatment
7.0 – 9.9	May be acceptable. There is a risk for hypoglycemia with oral diabetes agents or insulin. If there is hypoglycemia, decrease treatment.
10 – 20	This range is acceptable if there are no reversible symptoms
Frequent Values Greater than 20	Increase treatment

HgbA1c TARGETS, %	ACTION
Less than 8	Decrease diabetes treatment
> 8 and < 12	Acceptable, if asymptomatic
More than 12	Increase treatment

Routine blood glucose testing is usually not necessary for those with stable BG measures that are within target range when using oral agents or stable doses of basal insulin without regular/rapid insulin.

CLINICAL PEARLS

- **Consider that most oral medications decrease A1C by ≈1% when deciding whether and which medications can be stopped.**
- **Use NPH as basal insulin instead of long-acting insulin analogues such as glargine (Lantus™) or detemir (Levemir™), as NPH is less expensive with similar outcomes.**
- **Basal insulin alone (without regular or rapid insulin) may be preferable due to variations in oral intake that can lead to hypoglycemia.**
- **With consistent BG measures between 16 – 20mmol/L, an increase in treatment may be indicated.**
- **Do not stop insulin with type 1 diabetes.**

Developed by the Diabetes Care Program of Nova Scotia [http://cme.medicine.dal.ca/ADS.htm] with the Palliative and Therapeutic Harmonization (PATH) Program [www.pathclinic.ca]. For rational behind guideline: see Mallery LH. J Am Med Dir Assoc. 2013 Nov;14(11):801–8.

over 20 yrs Partnerships, Quality, and Innovation since 1991 — Diabetes Care Program of Nova Scotia — NOVA SCOTIA

path clinic — PALLIATIVE AND THERAPEUTIC HARMONIZATION

References

1. Diabetes Care Program of Nova Scotia. Department of Health and Wellness SEAscape Database, June 2011.
2. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). Erratum in Lancet 1999 Aug 14;354(9178):602. *Lancet*. 1998 Sep 12;352(9131):837-53.
3. ADVANCE Collaborative Group, Patel A, MacMahon S, Chalmers J, Neal B, Billot L, et al. Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. *N Engl J Med*. 2008 Jun 12;358(24):2560-72. Epub 2008 Jun 6.
4. Duckworth W, Abraira C, Moritz T. Glucose control and vascular complications in veterans with type 2 diabetes. VDAT Study. *N Engl J Med*. 2009 Jan 8;360(2):129-39. Epub 2008 Dec 17. Erratum in: *N Engl J Med.* 2009 Sep 3;361(10):1028. N Engl J Med. 2009 Sep 3;361(10):1024-5.
5. Action to Control Cardiovascular Risk in Diabetes Study Group, Gerstein HC, Miller ME, Byington RP, Goff DC Jr, Bigger JT, et al. Effects of intensive glucose lowering in type 2 diabetes. *N Engl J Med*. 2008 Jun 12;358(24):2545-59. Epub 2008 Jun 6.
6. Hemmingsen B, Lund SS, Gluud C, Vaag A, Almdal T, Hemmingsen C, et al. Intensive glycemic control for patients with type 2 diabetes: systematic review with meta-analysis and trial sequential analysis of randomized clinical trials. *BMJ*. 2011 Nov 24;343:d6898. doi: 10.1136/bmj.d6898. Review.
7. Coca SG, Ismail-Bergi F, Haq N, Krumholz HM, Parikh CR. Role of intensive glucose control in development of renal end points in type 2 diabetes mellitus: systematic review and meta-analysis intensive glucose control in type 2 diabetes. *Arch Intern Med*. 2012 May 28;172(10):761-9. Review. Erratum in: *Arch Intern Med*. 2012 Jul 23;172(14):1095.
8. Mallery LH, Ransom T, Steeves B, Cook B, Dunbar P, Moorhouse P. Evidence-Informed Guidelines for Treating Frail Older Adults With Type 2 Diabetes: From the Diabetes Care Program of Nova Scotia (DCPNS) and the Palliative and Therapeutic Harmonization (PATH) Program. J Am Med Dir Assoc. 2013 Nov;14(11):801–8.