

# DUE Quarterly

## DRUG USE IN THE ELDERLY

April 2011

PROMOTING MORE EFFECTIVE MEDICATION USE BY SENIORS

## Strategies for diagnosing and managing Type 2 diabetes in seniors

Type 2 diabetes is a chronic condition characterized by hyperglycemia from insulin resistance and/or deficiency. Obesity and inactivity are major causes of insulin resistance. Aging is associated with increased adiposity and lean body mass loss, while beta cell function also deteriorates. With increasing life expectancy and a growing elderly population, it is not surprising diabetes prevalence is increasing and highest among seniors. The National Diabetes Surveillance System shows more than 1 in 5 (23%) seniors aged 75 to 79 years have diabetes.

### Diagnosis

Current Canadian Diabetes Association (CDA) diagnosis Clinical Practice Guidelines (CPGs) rely on either a fasting plasma glucose of  $\geq 7.0$  mmol/L, or a casual plasma glucose of  $\geq 11.1$  mmol/L, with diabetic symptoms. Alternatively, an oral glucose tolerance test can be performed (see Table 1). In asymptomatic individuals, the diagnosis should be verified by a confirmatory test.

The CPGs suggest people 40 years or older be screened for diabetes with a fasting plasma glucose every 3 years, and more frequently if cardiovascular risk factors are present. For seniors, annual screening for diabetes is likely appropriate.

### The importance of a diagnosis

The goal is to identify diabetes patients at risk for microvascular (retinopathy, nephropathy, neuropathy) and

macrovascular (heart attack and stroke) complications. Forty per cent may already have microvascular complications at the time of diagnosis because Type 2 diabetes can have a long sub-clinical course. Additionally, good glycemic control will have further benefits in reducing incontinence, urinary tract infections and promoting wound healing.

### Switching to HbA1C for diagnosis?

Having patients fast, or return for formal oral glucose tolerance tests can be inconvenient and time consuming. Hemoglobin A1c (HbA1c) use has been a proposed alternative since it strongly predicts complication risks, does not require preparation, is much less variable, and is already used for monitoring diabetes control. In fact, a HbA1c  $\geq 6.5\%$  has been recommended as an alternative diagnostic criteria for diabetes by the American Diabetes Association, the International Diabetes Federation, and the European Association for the Study of Diabetes.

In Canada, HbA1c use for diabetes diagnosis has not yet been accepted. It should be noted that a validated HbA1c assay is required, and the test should be repeated for confirmation in the absence of symptoms. Furthermore, diabetes screening should be an ongoing process, since a negative test does not preclude future diabetes development. HbA1c is not a suitable test for people with hemoglobinopathies (thalassemia, sickle cell disease) and may not be reliable in those with anemia.

**Table 1. Diagnosis of diabetes**

<b>FPG <math>\geq 7.0</math> mmol/L</b> Fasting = no caloric intake for at least 8 hours or <b>Casual PG <math>\geq 11.1</math> mmol/L + symptoms of diabetes</b> Casual = any time of the day, without regard to the interval since the last meal Classic symptoms of diabetes = polyuria, polydipsia and unexplained weight loss or <b>2hPG in a 75-g OGTT <math>\geq 11.1</math> mmol/L</b>
<i>A confirmatory laboratory glucose test (an FPG, a casual PG or a 2hPG in a 75-g OGTT) must be done in all cases on another day in the absence of unequivocal hyperglycemia accompanied by acute metabolic decompensation. However, in individuals in whom type 1 diabetes is a possibility (younger individuals and lean, older individuals), to avoid rapid deterioration, confirmatory testing should not delay initiation of treatment.</i>
2hPG = 2-hour plasma glucose FPG = fasting plasma glucose OGTT = oral glucose tolerance test PG = plasma glucose
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## NEXT ISSUE

- Constipation

*DUE Quarterly offers expert opinions – not ACP-AMA guidelines or evaluations of drug use.*

**Glycemic targets –  
What should we aim for in seniors?**

Although a target HbA1c of 7% or less is recommended for most patients, CPGs recommend treatment goals and strategies be tailored to the patient. What does this mean for older adults?

Skeptics may argue tight glycemic control to prevent long-term complications is not relevant in seniors. For those with very poor life expectancy this may be appropriate. However, prevention of short-term hyperglycemia complications, such as incontinence due to polyuria, is highly relevant. In addition, seniors may be at higher risk for visual loss from co-existing conditions including cataracts, glaucoma and age-related macular degeneration.

Some factors may limit the ability to safely achieve tight glycemic targets in this group. Seniors are particularly vulnerable to hypoglycemia and polypharmacy risks.

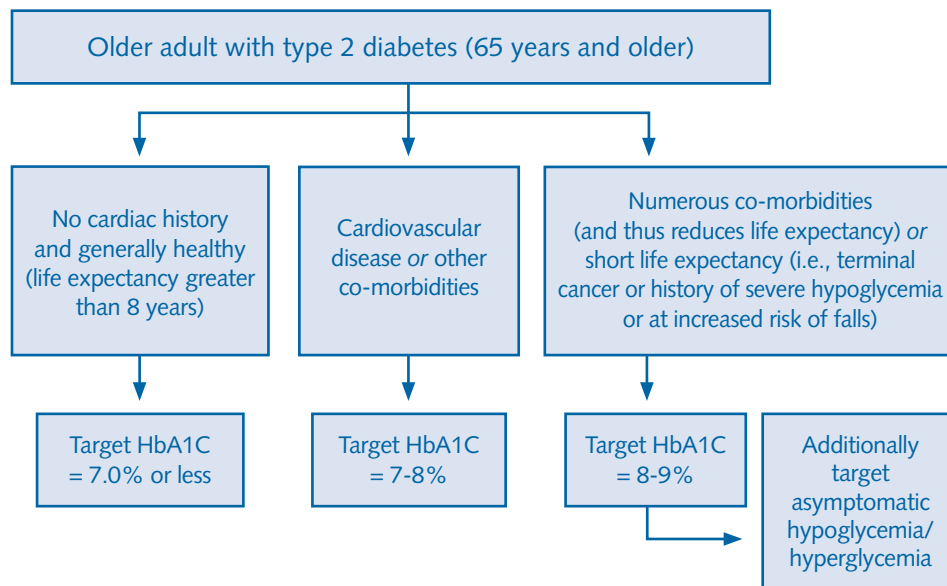
Tight glycemic control reduces the incidence and progression of microvascular complications in Type 2 diabetes. Tight control implemented from diagnosis (in younger adults) is associated with reduced cardiovascular disease in long-term UKPDS follow up (due to “metabolic memory” – later benefits from previous good glycemic control). Recent short-term trials (ACCORD, ADVANCE, VA-DT) in established diabetes patients have not shown any cardiovascular benefit (target HbA1c <6%) compared with more conventional control (7-7.9%), although there were microvascular benefits.

However, tight glycemic control is associated with increased hypoglycemia risk, and hypoglycemic episodes are associated with increased mortality. Old age, female gender, low BMI and renal impairment are all predictors of increased hypoglycemic risk. The premature termination of the glycemic arm of the ACCORD study should not call into question the value of tight glycemic control, but rather the aggressive polypharmacy strategy to achieve the HbA1c target at any cost. The excess mortality was statistically significant (3 deaths per 1,000 subjects). The absence of excess mortality in ADVANCE or VA-DT provides further reassurance in implementing tighter control.

Sinclair et al. recommended a target HbA1c range of 6.5-7.5% (with a fasting glucose range of 5.0-7.0 mmol/L) for seniors with

Type 2 diabetes who are generally healthy and free of major co-morbidities. For frail patients (i.e., those who are dependent, have multi-system disease or reside in long-term care facilities) they recommended a target HbA1C of 7.5-8.5% (with a fasting blood glucose range of 7.0-9.0 mmol/L).

We, the authors, propose the following generalized approach in seniors:



**Self-monitoring of blood glucose**

Although there is limited evidence proving blood glucose testing reduces HbA1c, it can be a vital part of an effective diabetes management strategy. Testing is likely most beneficial in patients taking insulin secretagogues (sulphonylureas, glitinides or insulin), during intercurrent illness and during changes in therapy.

In July 2009, the Canadian Agency for Drugs and Technology in Health recommended against routine blood glucose testing for patients with type 2 diabetes who are on diet therapy or oral anti-diabetes medication. In their report, however, it stated blood glucose self-monitoring may benefit patients: on secretagogues, with unstable glucose readings, who have changes in medications or lifestyle, who are acutely ill and at high risk of hypoglycemia.

**Our recommendations:**

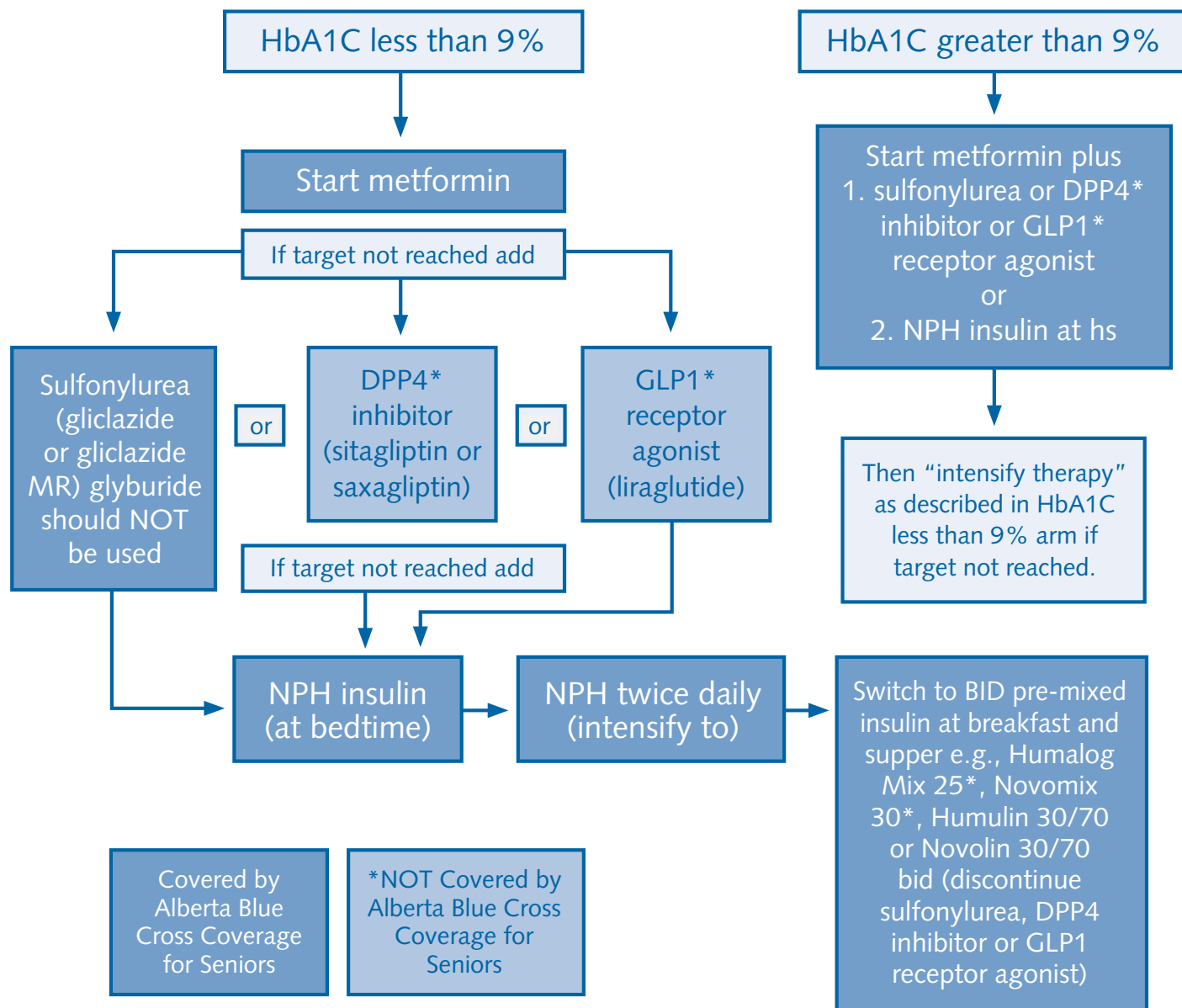
- Patients should be encouraged to test frequently at diagnosis to help them determine how diet, exercise and/or medication work.
- More frequent testing should be encouraged when pharmacotherapy changes (i.e., new oral medication is added) or there is a change in health status (i.e., ill). Test during the day, or

before supper and at bed time. The frequency will depend on current therapy – so a patient on metformin, testing once per week should perhaps test once daily at different times of the day during intercurrent illness. Another patient starting insulin at meals would likely need to test 4 times per day.

- Patients receiving insulin should be encouraged to test prior to insulin administration to avoid hypoglycemia.
- For patients who understand the relationship between exercise, diet and medication, and are maintaining blood glucose ranges within target as determined by HbA1c testing, frequent testing provides limited additional benefit when compared to cost.
- Using 4-7 tests per day for 2 days per month can be useful to judge control before (and possibly 2 hours after) each meal and at bed time.
- Ultimately, the amount of self monitoring of blood glucose needs to be individualized, negotiated with the patient or caregiver, and reassessed and renegotiated over time.

## Practically speaking . . .

### Pharmacotherapy strategy for older adults (Always to be used in addition to lifestyle modification)



Please see additional notes on page 4

In the elderly, risks of hypoglycemia are greater which is the rationale behind the variance from the COMPUS recommendations. CDA doesn't make any specific recommendation about 2nd or 3rd line therapies and we feel our recommendations perhaps steers a steady course.

### Self-monitoring glucose devices

Reduced dexterity and visual impairment in seniors may influence choice for a self-monitoring blood glucose device. Most devices available in Alberta have larger screens and bigger number displays. For people with significant visual loss, the Oracle® is a device which “speaks” the blood glucose value to the patient. For those with limited dexterity the Accu-Chek Compact® and Ascensia Breeze 2® blood glucose meters do not require strip handling. There are also two lancing devices available in Alberta that do not require direct handling of lancets. These lancing devices are the Accu-Chek Multiclix® (sold only together with the Accu-Chek Aviva® machine) and the I Test Disq® (sold by itself). Patients should be able to find the most suitable devices with a pharmacist’s help.

### One approach to pharmacotherapy

Although 2008 CDA CPGs provide information about available

pharmacotherapy agents, they do not easily outline a treatment approach to follow. We provide our generalized recommended approach on page 3 in practically speaking.

#### Additional notes on our approach

1. Acarbose may be tried after metformin as it has good cardiac safety data. Many patients experience flatulence with this treatment and prefer not to take it.
2. Repaglinide is an option instead of a sulfonylurea for patients who may skip meals or have varied meal times. We generally do not use this drug first as we have experienced low hypoglycemia levels similar to the ADVANCE trial.
3. Pioglitazone may be used after secretagogues or DDP4 Inhibitors. However, this should only be used in those seniors with low fracture risk, as thiazolidinediones may increase fracture risk.

4. Insulin glargine and insulin detemir are alternatives to NPH for those experiencing hypoglycemia. We use as an alternative typically as it is not covered by Alberta Blue Cross Coverage for Seniors.
5. Multi-daily insulin injections are also an alternative to pre-mixed insulins (i.e., rapid or short-acting insulin plus intermediate or long insulin). We typically use mixed insulins to reduce a patient’s costs and simplify regimens. In all cases, we adjust insulin doses to reach glycemic targets.

*References available upon request.*

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### Tips to keep in mind when it comes to pharmacotherapy

- **All oral agents reduce HbA1C on average by about 1%.** If a client’s HbA1C is quite elevated using insulin may be a better strategy at reducing HbA1C compared to multiple oral agents.
- **Insulin is an effective medication.** Patients should be educated early that insulin is one “tool” in our “tool kit.” Patients may have a

misconception that they have failed at their diabetes if they use insulin and are often afraid to use it. Practitioners may be equally afraid to prescribe it if unsure of how to initiate or titrate.

- **Hypoglycemia** in seniors can put patients at risk of negative outcomes including falls and hospitalization. We recommend not using glyburide as it is more likely than other sulfonylureas to cause hypoglycemia (active metabolite).

- Due to recent concern with **rosiglitazone**, use **pioglitazone** preferentially. However, pioglitazone likely contributes to increased fracture risk. Avoid in seniors with a high fracture risk.
- When creating a medication regimen for seniors **keep it simple**. Particularly in light of potential cognitive decline, medication and supply costs, paid caregiver costs, and stress and time of unpaid caregivers.

### We’d like your feedback . . .

Comments and suggestions for future articles are welcome. Please contact:

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