

SUMMARY OF GUIDELINE

Effective Date: Sept 1, 2010

Diabetes Mellitus (DM) Care

For full Guideline please go to website: www.BCGuidelines.ca

A. Prevention and Risk Factors

- *Type 1*: Influenced by family history of type 1 DM and other autoimmune diseases.
- *Type 2*:
 - Many cases can be prevented by modifying lifestyle. Consider intervening with metformin or acarbose in patients with impaired glucose tolerance.
 - Some risk factors are: obesity; age ≥ 40 years; close relative with type 2 DM; member of a high risk population (Aboriginal, Hispanic, South Asian, Asian, or African descent); history of impaired glucose tolerance, impaired fasting glucose, or other conditions associated with insulin resistance (e.g., dyslipidemia, hypertension, abdominal obesity, vascular disease, and schizophrenia with use of antipsychotic medications).

B. Screening and Diagnosis

- Screen people aged ≥ 40 years every 3 years; earlier and/or more often with addition risk factors.
- Classic diagnostic symptoms: Polyuria, polydipsia, unexplained weight loss, casual plasma glucose (PG) ≥ 11.1 mmol/L.
- Without classic symptoms, perform a fasting plasma glucose (FPG):
 - For FPG of 5.6-6.0: If no risk factors, re-screen more often; if 1 or more risk factors, consider 75 g oral glucose tolerance test (OGTT) and manage as in the next bullet.
 - For FPG of 6.1-6.9: Proceed to OGTT; diagnose DM if FPG ≥ 7.0 and 2-hr PG > 11 ; pre-DM if FPG 6.1-6.9 and 2-hr PG 7.8-11.0.
 - For FPG result ≥ 7.0 : Diagnose DM.

C. Lifestyle Management (see Table 1)

TABLE 1: Tips for Healthy Living and Self-Management

Healthy Living	Self-Management
<ul style="list-style-type: none"> • Encourage a long-term healthy diet • Calculate and optimize BMI (target 18.5-24.9 kg/m²) • Measure and optimize waist circumference • Encourage aerobic exercise (30 min/day) and resistance exercise (e.g., weights) 3 sessions weekly • Encourage smoking cessation at each visit 	<ul style="list-style-type: none"> • Educate re basic clinical management measurements such as BG, Hb A1C, BP, and lipid profile • Develop a mutually acceptable management plan including self-monitoring of blood glucose (SMBG) See H. Controversies in Care • Consider referral to a diabetes education clinic

D. Drug Management of Hyperglycemia based on A1C level

- *A1C < 9.0%*: Initiate metformin if not at target after 2-3 months of lifestyle intervention.
- *A1C $\geq 9.0%$* : Initiate pharmacotherapy immediately (metformin concurrently with another agent from a different class; or insulin) without waiting for effect from lifestyle interventions.
- *Symptomatic hyperglycemia with metabolic decompensation*: Initiate insulin \pm metformin.
- If not at target, adjust anti-diabetic agent or add another to attain target A1C within 6-12 months.
- See full guideline Appendices B-D for advice about additional DM agents (including costs).

E. Management of Hypoglycemia

- A serious complication of therapy; consider less stringent glycemic targets in patients at risk.
- Risk factors: Prior episode of severe hypoglycemia, long-term DM, current low A1C ($< 6.0\%$), autonomic neuropathy, hypoglycemia unawareness, treatment with insulin, and older age.
- Less common in Type 2 but vulnerable are the elderly and those on insulin or secretagogues.
- Educate patients and families about prevention, detection, and treatment of hypoglycemia.
- To reduce the risk, increase the frequency of SMBG (including episodic assessment during sleeping hours), loosen glycemic targets, and consider multiple insulin injections.
- Treatment of hypoglycemia (see Table 2)

TABLE 2: Management of Hypoglycemia Episodes

Severity	Definition	How to Treat
Mild	Autonomic symptoms; individual able to self-treat.	<ul style="list-style-type: none"> • Oral ingestion of 15 g of carbohydrate, preferably as glucose or sucrose tablets or solution, including 15 g glucose as tablets; 3 tsp or 3 packets of sugar dissolved in water; 175 ml juice/soft drink; 6 life savers; or 1 tbsp honey. • A snack of 15 g carbohydrate and protein can be used to prevent repeat hypoglycemia if a meal is >1 hour away.
Moderate	Autonomic & neuroglycopenic symptoms; individual able to self-treat.	
Severe	Individual requires assistance; unconsciousness may occur; PG typically < 2.8 mmol/L.	<ul style="list-style-type: none"> • Conscious: 20 g carbohydrate (preferably glucose tablets) orally. • Unconscious: Seek emergency assistance; in the home situation, teach support persons how to administer 1 mg glucagon SC or IM.
Patients on Acarbose		<ul style="list-style-type: none"> • Glucose (dextrose); if unavailable, use honey or milk. • Avoid sugar.

F. Preventing Complications and Comorbidities (Consider conservative targets in people with multiple comorbidities, a high level of functional dependency, or limited life expectancy)

- (a) *BP*: Record regularly with optimal $\leq 130/80$; drug choices include thiazide, ACEI / ARB, cardioselective B-blocker.
- (b) *Long-term glucose control*: A1C q3months initially; target $\leq 7.0\%$; q6months if control is good.
- (c) *SMBG*: Develop and review a schedule with the patient; general targets are pre-meal PG 4-7 and 2h PC PG 5-10 (more lenient targets if history of hypoglycemia or elderly); verify accuracy of glucose meter annually, i.e., simultaneous fasting glucose meter / lab comparison within 20%.
- (d) *Lipid profile*: Initial TC, HDL-C, LDL-C, triglycerides
- No lipid drug therapy: If lipids are within target values, recheck in 1-3 years.
 - On lipid drug therapy: Measure lipids within 6 to 8 weeks of initiation or change of pharmacotherapy and every 6 to 8 months thereafter.
 - ApoB can be used in place of lipid profiles for ongoing monitoring of therapy.
 - Lipid targets must relate to the calculated risk, individualized to each patient, of developing CHD (majority of patients with DM are high risk; risk calculators are useful, e.g., UKPDS).
- (e) *Stable CVD*: Consider low dose ASA; consider ACEI for age > 55, hypertension or albuminuria.
- (f) *Retinopathy*: Ensure dilated pupil retinal examination at diagnosis, then q1-2 years prn.
- (g) *Nephropathy*:
- Screen for macroscopic proteinuria & non-renal disease with urine dipstick.
 - If dipstick is negative for protein, measure albumin/creatinine ratio (ACR). If ACR is equivocal, repeat collection. Treat ACR if persistently above normal threshold.
 - Measure serum creatinine at least annually (lab will report eGFR).
 - Treatment may not normalize subsequent ACRs or eGFR.
 - Stages of classic diabetic nephropathy according to ACR (mg/mmol): Normal: M < 2.0; F < 2.8; micro-albuminuria (equivocal): M 2-20; F 2.8-28; overt nephropathy: M > 20; F > 28.
- (h) *Neuropathy*: Check annually for symptoms or findings; use monofilament during foot exam.
- (i) *Foot exam*: Examine feet annually (more for those at high risk); encourage regular self-exam.
- (j) *Psychosocial*: Screen for depression, anxiety and eating disorders; cognitive behaviour therapy (e.g., stress management, coping skills) may improve outcomes.
- (k) *Vaccinations*: Annual influenza vaccination plus pneumococcal vaccination as indicated.

G. Additional Practice Points

- *Type 1*: Refer to an experienced DM care team at diagnosis and at least annually. Consider multiple (3-4) daily insulin injections or continuous SC insulin infusions as part of an intensive management program.
- *Elderly people with Type 2*: Review meds periodically particularly with depression, falls, cognitive impairment, perceptual difficulties, or urinary incontinence. Use sulfonylureas (especially glyburide) with caution because the risk of hypoglycemia increases with age. Monitor postural BP.

H. Controversies in Care

- Ongoing controversies focus on appropriate targets and interventions for glycemic control, risk calculation, and SMBG for Type 2. See the full guideline for a review of evidence.