Guideline Summary NGC-9467

Guideline Title

Diabetes care.

Bibliographic Source(s)

Medical Services Commission. Diabetes care. Victoria (BC): British Columbia Medical Services Commission; 2010 Sep 1. 17 p. [33 references]

Guideline Status

This is the current release of the guideline.

Scope

Disease/Condition(s)

Type 1 and 2 diabetes mellitus (DM)

Guideline Category

Diagnosis

Management

Prevention

Risk Assessment

Treatment

Clinical Specialty

Endocrinology

Family Practice

Internal Medicine

Preventive Medicine

Intended Users

Physicians

Guideline Objective(s)

To describe the care objectives for the prevention, diagnosis and management of diabetes mellitus (DM) in non-pregnant adults. It focuses on the approaches and systems that are ideally in place to improve care for the majority of patients the majority of the time

Target Population

Non-pregnant adults with or at risk of developing type 1 and 2 diabetes mellitus (DM)

Interventions and Practices Considered

Prevention/Risk Assessment

1. Lifestyle modification
2. Pharmacologic intervention (metformin or acarbose)
3. Awareness of risk factors (e.g., obesity, age ≥40 years, high risk population)

Diagnosis

1. Fasting plasma glucose (FPG)

2. Glycosylated hemoglobin (A1C)

Management

1. Healthy diet
2. Calculation of body mass index (BMI)
3. Aerobic exercise
4. Smoking cessation
5. Patent education
6. Referral to diabetes education clinic
7. Hyperglycemia and hypoglycemia management (e.g., consider less stringent glycemic targets in patients at risk of hypoglycemia)
8. Preventing complications and comorbidities
   - Blood pressure
   - Glucose control
   - Lipids
   - Cardiovascular disease
   - Retinopathy
   - Nephropathy
   - Neuropathy
   - Foot examination
   - Psychosocial aspects
   - Vaccinations
   - Additional practice points

Major Outcomes Considered

- Complication rates from diabetes mellitus (DM)
- Mortality

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Evidence was obtained through a systematic review of peer-reviewed literature (up to June 2010) using the terms for diabetes care, prevention, specific populations, testing pre-diabetes, classification/diagnosis, management, medications, insulin, metformin, glycemic management, hypertension, lipid control, dyslipidemia, screening/diagnosis, cardiovascular disease, renal disease, etc. with the databases MEDLINE, PubMed, EBSCO, Ovid, and the Cochrane Collaboration's Database for Systematic Reviews. Clinical practice guidelines from other jurisdictions were also reviewed (up to June 2010).

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Not stated

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

This guideline is an evidence-based clinical guideline for general practitioners with consensus statements when evidence is not available. It is based on scientific evidence current as of the Effective Date.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The guideline was approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

Recommendations

Major Recommendations

Prevention and Risk Factors

Safe and effective therapies for the prevention of type 1 diabetes mellitus (DM) have not yet been identified. The risk for developing type 1 DM is influenced by family history of type 1 DM and other autoimmune diseases.

A large proportion of type 2 DM can be prevented using lifestyle modification and/or pharmacologic intervention. Lifestyle modification is particularly important for persons considered at high risk, and pharmacologic therapy with metformin or acarbose can also be considered for patients with impaired glucose tolerance (IGT). Risk factors for type 2 DM include but are not limited to: 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 IGT or impaired fasting glucose (IFG) and other conditions associated with insulin resistance (e.g., dyslipidemia, hypertension, abdominal obesity, vascular disease, schizophrenia and use of antipsychotic medications).

Diagnosis

The classic diagnostic symptoms for DM are polyuria, polydipsia, and unexplained weight loss with a "casual"* plasma glucose (PG) ≥11.1 mmol/L. In the absence of classic symptoms, a fasting† plasma glucose (FPG) is the recommended initial test in the diagnosis of diabetes. Glycosylated hemoglobin (A1C) has been proposed as a diagnostic test for type 2 diabetes; however, has not universally been adopted. See Appendix A in the original guideline document for the Screening Algorithm for Type 2 DM in Adults.

*Casual=any time of day, regardless of the interval since the last meal.

†Fasting = no caloric intake for at least 8 hours

Lifestyle Management of DM*

Healthy Living

- Encourage a long-term healthy diet, recognizing diverse diets and needs.
- Calculate and optimize patient's body mass index (BMI) (mass in kilograms/height in metres^2)

Target BMI: 18.5-24.9 kg/m^2
Note that desirable BMI range may be lower for certain populations, (e.g. Asian, Pacific).

- Measure and optimize patient's waist circumference (WC).

Targets for WC: male (M) ≤94 cm; female (F) ≤80 cm (Europid, Sub-Saharan African, Eastern Mediterranean and Middle Eastern); M ≤90 cm; F ≤80 cm (South Asian, Chinese, Japanese, South and Central American).

- Encourage aerobic exercise (30 min/day) and resistance exercise (i.e., weights) 3 sessions/week. *Aerobic exercise and/or resistance training may also benefit elderly people with type 2 DM and can be recommended if not contraindicated. Consider an electrocardiogram (ECG) stress test for previously sedentary people with additional risk factors for cardiovascular disease (CVD) who wish to undertake exercise more vigorous than brisk walking*.
- At each visit encourage patient to stop smoking; provide support as needed.

Self-Management

- Educate patients regarding basic clinical management measurements such as blood glucose, glycosylated hemoglobin (A1C), blood pressure (BP), and lipid profile. Encourage patients to accept responsibility for the care of their DM and develop a mutually acceptable management plan, including an identified primary care provider and individualized self-monitoring of blood glucose (SMBG). See Controversies in Care: SMBG in the original guideline document.
- Consider referral to a Diabetes education clinic.

*See Patient Education and Resources in the original guideline document; for practitioners see

www.primaryhealthcarebc.ca/gpsc_initiatives.html.

Management of Hyperglycemia and Hypoglycemia

- Focus is on achieving target A1C levels and on minimizing symptomatic hyper- and hypoglycemia.

Hyperglycemia

Please refer to Appendix B in the original guideline document for the Management of Hyperglycemia in type 2 DM, including details on when to initiate oral hypoglycemic medications or insulin without a 2-3 month trial of lifestyle modifications alone.

- Appendix C in the original guideline document: Antidiabetic Agents and Adjunctive Agents for Use in Type 2 DM
- Appendix D in the original guideline document: Insulin Therapeutic Considerations and Availability

Hypoglycemia

- **Hypoglycemia can be 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, current treatment with insulin, and being elderly. Severe hypoglycemia is less common in persons with type 2 DM but the elderly and those on insulin or secretagogues are more vulnerable.
- *Prevention*: Educate patients and families about prevention, detection and treatment of hypoglycemia. See Patient Education and Resources in the original guideline document.
- *To reduce the risk of hypoglycemia*: increase the frequency of SMBG (including episodic assessment during sleeping hours), make glycemic targets less stringent, and consider multiple insulin injections.

Treatment: See Appendix E in the original guideline document: Treatment of Hypoglycemia.

Preventing Complications and Comorbidities of DM

Healthy elderly people with DM may be treated to achieve the same targets as younger people (e.g., glucose control, BP, and lipids). Consider more conservative targets in people with multiple comorbidities, a high level of functional dependency, or limited life expectancy.

Blood Pressure

- BP control is a priority; measure and record at diagnosis and regularly thereafter: optimize to ≤130/80.
- If lifestyle modification is not sufficient, choose from the following first-line agents: a thiazide diuretic, angiotensin-converting enzyme inhibitors/angiotensin II receptor blocker (ACEI/ARB), cardioselective B-blocker.

Blood Glucose: Long-term Control

Studies suggest there is a long-term "legacy" benefit of glucose lowering early in the course of type 1 and 2 DM.

- Measure glycosylated hemoglobin (A1C) every 3 months to ensure that glycemic goals are being met or maintained. Target for most patients A1C ≤7.0% (see Controversies in Care in the original guideline document).
- **Consider testing every 6 months if treatment and lifestyle remains stable and if targets have been consistently met.**
- Focus on minimizing symptomatic hypo- and hyperglycemia, in addition to A1C levels.

Blood Glucose: SMBG*

- Reinforce patient's responsibility for regular monitoring as appropriate; ensure patients can use glucose meter, interpret results and modify treatment as needed (see Controversies in Care in the original guideline document).
- Develop a blood glucose-monitoring schedule with patient and review records. SMBG is more important when using a drug that can cause hypoglycemia. Targets for most patients: Premeal = 4.0–7.0 mmol/L: 2h Postmeal = 5.0–10.0 mmol/L (more lenient targets can be used in patients with history of hypoglycemia or the elderly).
- Annual accuracy verification of glucose meter (simultaneous fasting glucose meter/lab comparison within 20%).

*Blood glucose test strips are a PharmaCare benefit for those holding a valid Certificate of Training in self-monitoring of blood glucose from a British Columbia (BC) diabetes education centre.

Lipid Profile

- Measure fasting lipid profile (total cholesterol [TC], high-density lipoprotein cholesterol [HDL-C], low-density lipoprotein cholesterol [LDL-C], triglycerides) initially. If within target without therapy then consider rechecking q1-3 years as clinically indicated.
- In patients receiving lipid treatment measure lipids within 6 to 8 weeks of initiation or change of pharmacotherapy and every 6 to 8 months thereafter (creatinine kinase [CK] and alanine transaminase [ALT] are the recommended safety tests)
- Apolipoprotein B (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 coronary heart disease (CHD) – although the majority of diabetic patients are high risk (see Controversies in Care in the original guideline document). To estimate the 10-year risk of CHD for patients with type 2 DM use the UK prospective diabetes (UKPDS) risk calculator or table, available at: www.dtu.ox.ac.uk/riskengine/

Lipid Targets (LDL-C or ApoB) According to CHD Risk Category*		
	LDL-C (mmol/L)	ApoB (g/L)
Moderate risk (<20% 10-year risk)	<3.5	<1.05
High risk (≥20% 10-year risk)	<2.5	<0.85
*LDL-C target of <2.0 or ApoB <0.8 (or a 50% LDL-C decrease from the baseline value) has been suggested by the new Canadian Cardiovascular Society (CCS) guidelines for individuals in the moderate risk category with LDL-C >3.5 or ApoB >1.0. (See Controversies in Care in the original guideline document).		

ApoB, apolipoprotein B; CHD, coronary heart disease; LDL-C, low-density lipoprotein cholesterol.

Cardiovascular (CV) Disease

- Consider low dose acetylsalicylic acid (ASA) (81-325 mg) for people with stable cardiovascular disease. The decision to prescribe antiplatelet therapy for primary prevention of CV events should be based on individual clinical judgement.
- Consider employing angiotensin-converting enzyme inhibitors for any patient over 55 years of age, patients with hypertension or patients with confirmed albuminuria.

Retinopathy

Early recognition and treatment of retinopathy can prevent blindness.

- Ensure patient receives dilated pupil retinal examination at diagnosis, then every one to two years or as indicated (annual referral to optometrist/ophthalmologist).

Nephropathy

- Screen for macroscopic proteinuria and non-renal disease with urine dipstick.
- If protein-negative dipstick measure albumin/creatinine ratio (ACR): If ACR is equivocal, repeat collection; treat ACR if persistently above normal threshold.
- Measure serum creatinine (SCr) (lab will report estimated glomerular filtration rate [eGFR]) at least annually.
- 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

Neuropathy

The best way to prevent diabetic neuropathy is to regularly monitor and manage blood glucose.

- Check annually for symptoms or findings such as peripheral anesthetic neuropathy or pain, or autonomic neuropathy (e.g., erectile dysfunction, gastrointestinal disturbance, orthostatic hypotension).
- Include screening via monofilament during foot exam.

Foot Examination

- Examine feet annually, and more frequently for those at high risk (i.e., patients with anesthetic neuropathy).
- Encourage regular self-examination of feet.

Psychosocial Aspects of Diabetes

Challenging psychosocial factors affect many aspects of diabetes management and glycemic control.

- Screen for depression, anxiety and eating disorders. Treatment of these conditions may improve outcomes.
- Cognitive behaviour therapy (CBT) based techniques such as stress management strategies and coping skills can be implemented to improve outcomes.

Vaccinations

- Annual influenza vaccination.
- Pneumococcal vaccination: A single re-vaccination is recommended if the patient is >65 and previous vaccination was more than 5 years ago.

Additional Practice Points

Type 1 DM

- Patients with type 1 diabetes should see an experienced DM care team at diagnosis and at least annually.
- Insulin use: Multiple (3-4) daily injections or the use of continuous subcutaneous insulin infusions (CSII) should be considered as part of an intensive diabetes management program.

Type 2 DM

- See Appendix B in the original guideline document for Management of Hyperglycemia in Type 2 Diabetes.
- In elderly people with type 2 DM:
  - Polypharmacy: review medication list periodically, particularly if the patient presents with depression, falls, cognitive impairment, perceptual difficulties, or urinary incontinence.
  - Sulfonylureas: (especially glyburide) use with caution because the risk of hypoglycemia increases with age. Generally initial doses can be half of those for younger people and increased more slowly.
  - Monitor for postural BP.

Clinical Algorithm(s)

The following clinical algorithms are provided in the appendices of the original guideline document:

- Screening Algorithm for Type 2 Diabetes in Adults
- Management of Hyperglycemia in Type 2 Diabetes

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

This guideline is an evidence-based clinical guideline for general practitioners with consensus statements when evidence is not available. The type of supporting evidence is not specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Appropriate prevention, diagnosis and management of diabetes mellitus (DM) in non-pregnant adults
- Management of hyperglycemia and hypoglycemia

Potential Harms

Side effects of medication (see the table in Appendix B in the original guideline document for disadvantages of medications)

Contraindications

Contraindications

- Biguanide is contraindicated if creatinine clearance/estimated glomerular filtration rate (CrCL/eGFR) <30 mL/min.
- Repaglinide is contraindicated with gemfibrozil.
- Incretin mimetics (glucagon like peptide [GLP]-1) are contraindicated in patients with personal or family history of medullary thyroid carcinoma or patients with multiple endocrine neoplasia syndrome type 2.
- Avoid thiazolidinediones in patients with heart failure or hepatic dysfunction.

Qualifying Statements

Qualifying Statements

The Clinical Practice Guidelines (the "Guidelines") have been developed by the Guidelines and Protocols Advisory Committee on behalf of the Medical Services Commission. The Guidelines are intended to give an understanding of a clinical problem, and outline one or more preferred approaches to the investigation and management of the problem. The Guidelines are not intended as a substitute for the advice or professional judgment of a health care professional, nor are they intended to be the only approach to the management of clinical problems.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Chart Documentation/Checklists/Forms

Clinical Algorithm

Mobile Device Resources

Patient Resources

Quick Reference Guides/Physician Guides

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Medical Services Commission. Diabetes care. Victoria (BC): British Columbia Medical Services Commission; 2010 Sep 1. 17 p. [33 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2010 Sep 1

Guideline Developer(s)

Medical Services Commission, British Columbia - State/Local Government Agency [Non-U.S.]

Source(s) of Funding

Medical Services Commission, British Columbia

Guideline Committee

Guideline and Protocols Advisory Committee

Composition of Group That Authored the Guideline

Not stated

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the British Columbia Ministry of Health Web site.

The guideline is also available for mobile devices from the British Columbia Ministry of Health Web site.

Availability of Companion Documents

The following is available:

- Diabetes mellitus (DM) care. Summary of guideline. Victoria (BC): British Columbia Medical Services Commission; 2011 May 1. 2 p. Electronic copies: Available in Portable Document Format (PDF) from the British Columbia Ministry of Health Web site.

In addition, a patient care flow sheet is available in the appendices to the original guideline document.

Patient Resources

A patient guide is available in the original guideline document.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI Institute on January 31, 2013. The information was verified by the guideline developer on February 12, 2013.

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