SCREENING & DIAGNOSIS

Who to screen and what do you screen with?

Screen every 3 years in individuals ≥40 years of age or in individuals at high risk using a risk calculator.

Screen earlier and/or more frequently in people with additional risk factors for diabetes or for those at very high risk using a risk calculator.

DIAGNOSIS OF PREDIABETES & DIABETES

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
<th>Dysglycemia category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FPG (mmol/L)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No caloric intake for at least 8 hours</td>
<td>6.1 – 6.9</td>
<td>IFG</td>
</tr>
<tr>
<td></td>
<td>≥7.0</td>
<td>Diabetes</td>
</tr>
<tr>
<td><strong>2hPG in a 75 g OGTT (mmol/L)</strong></td>
<td>7.8 – 11.0</td>
<td>IGT</td>
</tr>
<tr>
<td></td>
<td>≥11.1</td>
<td>Diabetes</td>
</tr>
<tr>
<td><strong>A1C (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardized, validated assay, in the absence of factors that affect the accuracy of A1C and not for suspected type 1 diabetes</td>
<td>6.0 – 6.4</td>
<td>Prediabetes</td>
</tr>
<tr>
<td></td>
<td>≥6.5</td>
<td>Diabetes</td>
</tr>
<tr>
<td><strong>Random PG (mmol/L)</strong></td>
<td>≥11.1</td>
<td>Diabetes</td>
</tr>
</tbody>
</table>

If asymptomatic, a repeat confirmatory test (FPG, A1C, or a 2hrPG in a 75 g OGTT) must be done. If symptomatic, diagnosis made, and begin treatment.
WHAT A1C SHOULD I TARGET?

A target A1C $\leq 6.5\%$ may be considered in some patients with type 2 diabetes to further lower the risk of nephropathy and retinopathy which must be balanced against the risk of hypoglycemia.

Consider 7.1-8.5\% if:
- Limited life expectancy
- High level of functional dependency
- Extensive coronary artery disease at high risk of ischemic events
- Multiple co-morbidities
- History of recurrent severe hypoglycemia
- Hypoglycemia unawareness
- Longstanding diabetes for whom it is difficult to achieve an A1C $\leq 7\%$, despite effective doses of multiple antihyperglycemic agents, including intensified basal-bolus insulin therapy.
**At diagnosis of type 2 diabetes**

- **Start lifestyle intervention (nutrition therapy and physical activity) +/- Metformin**
- **A1C <8.5%**
  - Start metformin immediately.
  - Consider initial combination with another antihyperglycemic agent.
- **A1C ≥8.5%**
  - Symptomatic hyperglycemia with metabolic decompensation
  - Initiate insulin +/- metformin

### Add another agent best suited to the individual by prioritizing patient characteristics:

<table>
<thead>
<tr>
<th>PATIENT CHARACTERISTIC</th>
<th>CHOICE OF AGENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical cardiovascular disease</td>
<td>Antihyperglycemic agent with demonstrated CV outcome benefit (empagliflozin, liraglutide)</td>
</tr>
</tbody>
</table>

- **Priority:**
  - Degree of hyperglycemia
  - Risk of hypoglycemia
  - Overweight or obesity
  - Cardiovascular disease or multiple risk factors
  - Comorbidities (renal, CHF, hepatic)
  - Preferences & access to treatment

### Add another class of agent best suited to the individual (classes listed in alphabetical order):

<table>
<thead>
<tr>
<th>Class</th>
<th>Relative A1C Lowering</th>
<th>Hypoglycemia</th>
<th>Weight Effect in Cardiovascular Outcome Trial</th>
<th>Other therapeutic considerations</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha-glucosidase inhibitor (acarbose)</td>
<td>↓</td>
<td>Rare</td>
<td>Neutral to ↓</td>
<td>Improved postprandial control, GI side-effects</td>
<td>$$</td>
</tr>
<tr>
<td>DPP-4 Inhibitors</td>
<td>↓↓</td>
<td>Rare</td>
<td>Neutral to ↓</td>
<td>Alo, Sasa, Sita Neutral</td>
<td>Caution with saxagliptin in heart failure</td>
</tr>
<tr>
<td>GLP-1R agonists</td>
<td>↓↓ to ↓↓</td>
<td>Rare</td>
<td>Neutral</td>
<td>Insulinemia Superiority in T2DM patients with clinical CVD Lix: Neutral</td>
<td>GI side effects</td>
</tr>
<tr>
<td>Insulin</td>
<td>↓↓↓↓</td>
<td>Yes</td>
<td>↑↑</td>
<td>Glar: Neutral</td>
<td>No dose ceiling, flexible regimens</td>
</tr>
<tr>
<td>Insulin secretagogue: Meglitinide</td>
<td>↓↓</td>
<td>Yes</td>
<td>↑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfonylurea</td>
<td>↓↓</td>
<td>Yes</td>
<td>↑</td>
<td>Less hypoglycemia in context of missed meals but usually requires TID to QID dosing</td>
<td></td>
</tr>
<tr>
<td>SGLT2 inhibitors</td>
<td>↓↓ to ↓↓</td>
<td>Rare</td>
<td>↑↓</td>
<td>Emper: Superiority in T2DM patients with clinical CVD</td>
<td>Genital infections, UTI, hypotension, dose-related changes in LDL-C, caution with renal dysfunction and loop diuretics, dapagliflozin not to be used if bladder cancer, rare diabetic ketoacidosis (may occur with no hyperglycemia)</td>
</tr>
<tr>
<td>Thiazolidinediones</td>
<td>↓↓</td>
<td>Rare</td>
<td>↑↑</td>
<td>Neutral</td>
<td>CYP, edema, fractures, rare bladder cancer (pioglitazone), cardiovascular controversy (rosiglitazone), 6-12 weeks required for maximal effect</td>
</tr>
<tr>
<td>Weight loss agent (orlistat)</td>
<td>↓</td>
<td>None</td>
<td>↓</td>
<td>GI side effects</td>
<td>$$$</td>
</tr>
</tbody>
</table>

- alo=alogliptin; empa=empagliflozin; glar=glargine; lir=liraglutide
- lix=lixisenatide; sas=saxagliptin; sit=sitagliptin

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If not at glycemic targets
- Add another agent from a different class
- Add/intensify insulin regimen

**Make timely adjustments to attain target A1C within 3-6 months**
The ABCDEs

A  A1C – optimal glycemic control (usually ≤7%)

B  BP – optimal blood pressure control (<130/80 mmHg)

C  Cholesterol – LDL-C ≤2.0 mmol/L if decision made to treat

D  Drugs to protect the heart (see algorithm)
   A – ACEi or ARB
   S – Statin
   A – ASA if indicated

E  Exercise/Eating – regular physical activity, healthy diet, achievement and maintenance of healthy body weight

S  Smoking cessation

See next panel for algorithm.
Does this patient require vascular protective medications?

**STEP 1:** Does the patient have end organ damage?
- Macrovascular disease
  - Cardiac ischemia (silent or overt)
  - Peripheral arterial disease
  - Cerebrovascular/Carotid disease
- Microvascular disease
  - Retinopathy
  - Nephropathy (ACR ≥2.0)
  - Neuropathy

**STEP 2:** What is the patient’s age?
- ≥55 years
- 40-54 years

**STEP 3:** Does the patient...
- Have diabetes >15 years AND age >30 years
- Warrant statin therapy based on the 2012 Canadian Cardiovascular Society Lipid Guidelines

See next panels for recommendations on vascular protection, women of childbearing age, and the frail elderly.

* Dose adjustments or additional lipid therapy warranted if lipid target (LDL-C ≤2.0 mmol/L) not being met.
# ACE-inhibitor or ARB (angiotensin receptor blocker) should be given at doses that have demonstrated vascular protection [eg. perindopril 8 mg once daily (EUROPA trial), ramipril 10 mg once daily (HOPE trial), telmisartan 80 mg once daily (ONTARGET trial)].

ASA should not be used for the primary prevention of cardiovascular disease in people with diabetes. ASA may be used for secondary prevention.

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**Diagram:**
- **STATIN***
- **ACEi or ARB***
- **ASA**
- **Clopidogrel if ASA-intolerant**
SPECIAL POPULATIONS

In women of childbearing age (type 1 or type 2 diabetes)...

• Discuss pregnancy plans at every visit
• Pregnancies should be planned
• Prior to conception
  • A1C ≤7.0%
  • Start...
    - Folic acid 5 mg per day x 3 months preconception
  • Stop...
    - Non-insulin antihyperglycemic agents (except metformin in women with polycystic ovarian syndrome)
    - Statins
    - ACEi or ARB either prior to or upon detection of pregnancy
  • Screen for complications (eye appointment, urine ACR)
SPECIAL POPULATIONS

In the frail elderly or those with limited life expectancy...

- Potential benefits of treatment must be balanced against the potential risks of harm (eg. hypoglycemia, hypotension, falls)
- Target A1C ≤8.5%
PROMOTE SELF-MANAGEMENT

Self-Management Education (SME) should be discussed at every diabetes-focused visit and individualized according to type of diabetes, patient ability, and motivation for learning and change.

**Set S.M.A.R.T. Goals**

- **S**pecific
- **M**easurable
- **A**chievable
- **R**ealistic
- **T**imely

<table>
<thead>
<tr>
<th>Self-Management Areas of Focus</th>
<th>Collaborate with your patient to create an action plan on their identified area of focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Education</td>
<td>Enable timely, culturally and literacy appropriate diabetes education and resources</td>
</tr>
<tr>
<td>Nutrition</td>
<td>Encourage to follow <em>Eating Well with Canada’s Food Guide</em> and refer for dietary counseling</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>Minimum 150 minutes aerobic activity per week and resistance exercise 2-3 times per week</td>
</tr>
<tr>
<td>Weight loss (5 - 10% of initial weight)</td>
<td>Can substantially improve glycemic control and cardiovascular disease risk factors in overweight patients</td>
</tr>
<tr>
<td>Medication</td>
<td>Counsel about adherence (dose, timing, frequency), anticipated effects, and mechanism of action</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Counsel about the prevention, recognition, and treatment of drug-induced hypoglycemia</td>
</tr>
<tr>
<td>Self-Monitoring Blood Glucose (SMBG)</td>
<td><strong>Not on insulin:</strong> Individualized to type of antihyperglycemic agents, level of control, and risk of hypoglycemia</td>
</tr>
<tr>
<td></td>
<td><strong>On insulin only once a day:</strong> SMBG ≥ once a day at variable times</td>
</tr>
<tr>
<td></td>
<td><strong>On insulin &gt; once a day:</strong> SMBG ≥ 3 times per day including pre- and post-prandial values</td>
</tr>
<tr>
<td>Foot Care</td>
<td>Educate on proper foot care including daily foot inspection</td>
</tr>
<tr>
<td>Mental Health &amp; Mood Disorders</td>
<td>Screen for depressive and anxious symptoms by interview or a standardized questionnaire (eg. PHQ-9) <a href="http://www.phqscreeners.com">www.phqscreeners.com</a></td>
</tr>
<tr>
<td>Smoking Cessation</td>
<td>Include formal smoking prevention and cessation counseling</td>
</tr>
</tbody>
</table>
PATIENT SME ACTION PLAN

• Date:

• The change I want to make happen is:

• My goal for the next month is:

• **Action Plan:** The specific steps I will take to reach my goal (what, when, where, how often):

• Things that could make it difficult to achieve my goal:

• My plan for overcoming these challenges are:

• Support and resources I will need:

• **How important is it to me that I achieve my goal?** (scale of 0 to 10, with 0 being not important at all and 10 being extremely important):

• **How confident am I that I can achieve my goal?** (scale of 0 to 10, with 0 being not confident at all and 10 being extremely confident):

• Review date:
TEAM CARE & ORGANIZATION OF CARE

The Five ‘Rs’

**Recognize:**
Consider diabetes risk factors for all of your patients and screen appropriately for diabetes.

**Register:**
Develop a registry or a method of tracking all your patients with diabetes.

**Resource:**
Support self-management through the use of interprofessional teams which could include the primary care provider, diabetes educator nurse, pharmacist, dietitian, and other specialists.

**Relay:**
Facilitate information sharing between the person with diabetes and team members for coordinated care and timely management change.

**Recall:**
Develop a system to remind your patients and caregivers of timely review and reassessment of targets and risk of complications.

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