

UPDATED FOR 2024

Clinical Practice Guidelines Quick Reference Guide

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Screening and diagnosis of type 2 diabetes in adults

Assess risk factors for type 2 diabetes ANNUALLY:

- Family history (first-degree relative with type 2 diabetes)
- High risk populations (non-white, low socioeconomic status)
- History of GDM/prediabetes
- Cardiovascular risk factors
- Presence of end organ damage associated with diabetes
- Other conditions and medications associated with diabetes (see CPG Chapter 4, Screening for Diabetes in Adults, Table 1)

Who to screen

Who to screen	No risk factors	Age <40 years or low-moderate risk*	No screen indicated
		Age ≥40 years or high risk* (33% chance of developing type 2 diabetes within 10 years)	Screen every 3 years
		or very high risk (50% chance of developing type 2 diabetes within 10 years)	Screen every 6 to 12 months
	Presence of risk factors		

How to screen

Test	Result	Dysglycemia category
FPG (mmol/L) No caloric intake for at least 8 hours	6.1 – 6.9	IFG
	≥7.0	Diabetes
A1C (%)**	6.0 – 6.4	Prediabetes
	≥6.5	Diabetes

If asymptomatic and A1C or FPG are in the diabetes range, repeat the same test (A1C or FPG) as a confirmatory test. If both FPG and A1C are available and only one is in the diabetes range, repeat the test in the diabetes range as the confirmatory test. If both A1C and FPG are available and are each in the diabetes range, diabetes is confirmed. If symptoms of overt hyperglycemia are present, diagnosis of diabetes can be determined with one test (A1C, FPG, 2hPG, random PG) in the diabetes range, see Chapter 3, CPG.

*using a validated risk calculator (e.g. CANRISK)

**Use a standardized, validated assay. Be aware of factors that affect A1C accuracy (see CPG Chapter 9, Table 1)

A1C Targets for glycemic management

A1C%	Targets
<6.0	Selected adults with type 2 diabetes with potential for remission to normoglycemia
≤6.5*	Adults with type 2 diabetes to reduce the risk of chronic kidney disease and retinopathy if at low risk of hypoglycemia†
≤7.0	MOST ADULTS WITH TYPE 1 OR TYPE 2 DIABETES
7.1	7.1-8.0%: Functionally dependent†
↓	7.1-8.5%:
8.5	<ul style="list-style-type: none"> • Recurrent severe hypoglycemia and/or hypoglycemia unawareness • Limited life expectancy • Frail elderly and/or with dementia‡

Avoid higher A1C to minimize risk of symptomatic hyperglycemia and acute and chronic complications

End of life: A1C measurement not recommended. Avoid symptomatic hyperglycemia and any hypoglycemia.

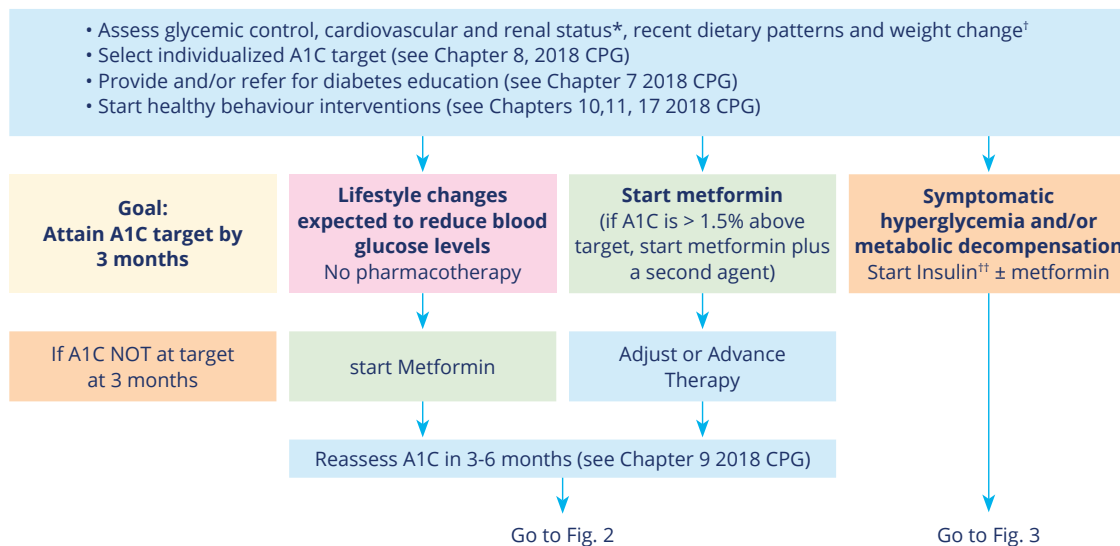
* Target 6.0 to <6.5 for adults with type 2 diabetes with potential for remission to prediabetes

† Based on class of antihyperglycemic medication(s) utilized and the person's characteristics

‡ See Diabetes in Older People chapter

At diagnosis of type 2 diabetes (Fig. 1)

2020



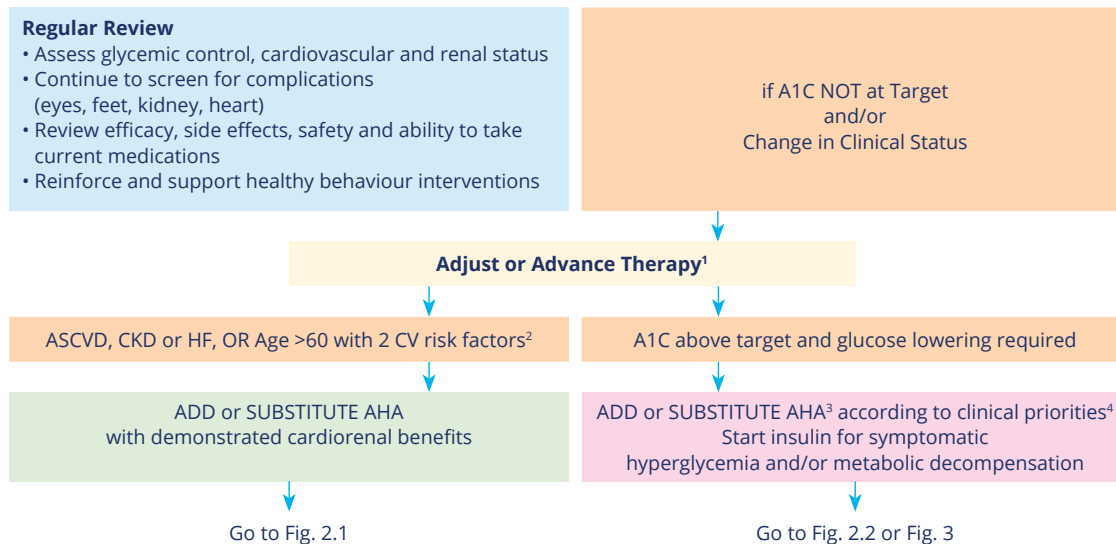
* In individuals **with** atherosclerotic cardiovascular disease, history of heart failure (with reduced ejection fraction) or chronic kidney disease, agents with cardiorenal benefits may be considered (see Pharmacologic Glycemic Management of Type 2 Diabetes in Adults 2020 Update – The Users Guide)

† Unintentional weight loss should prompt consideration of other diagnoses (e.g. type 1 diabetes or pancreatic disease)

†† Reassess need for ongoing insulin therapy once type of diabetes is established and response to healthy behaviour interventions is assessed

Reviewing, adjusting or advancing therapy in type 2 diabetes (Fig. 2)

2020



1 Changes in clinical status may necessitate adjustment of glycemic targets and/or deprescribing

2 Tobacco use; dyslipidemia (use of lipid modifying therapy or a documented untreated LDL ≥ 3.4 mmol/L, or HDL-C < 1.0 mmol/L for men and < 1.3 mmol/L for women, or triglycerides ≥ 2.3 mmol/L); or hypertension (use of blood pressure drug or untreated SBP ≥ 140 mm Hg or DBP ≥ 95 mmHg)

3 All AHA's have Grade A evidence for effectiveness to reduce blood glucose levels

4 Consider degree of hyperglycemia, costs and coverage, renal function, comorbidity, side effect profile, and potential for pregnancy

For people with ASCVD, CKD or HF, OR >60 yrs and 2 CV risk factors (Fig. 2.1)

2020

ADD or SUBSTITUTE AHA with demonstrated cardiorenal benefits

		Established Cardiovascular or Renal Disease			Risk Factors
		ASCVD	CKD	HF	>60 yrs with 2 CV risk factors [†]
Lower Risks Observed in Outcomes Trials	MACE	GLP1-RA ^{††} or SGLT2i [*]	SGLT2i [*] or GLP1-RA ^{††}		GLP1-RA ^{††}
	HHF	SGLT2i [*]	SGLT2i [*]	SGLT2i [*] (and lower CV mortality)	SGLT2i [*]
	Progression of Nephropathy	SGLT2i [*]	SGLT2i [*]		SGLT2i [*]

Highest level of evidence **Grade A** Grade B Grade C or D

[†] Tobacco use; dyslipidemia (use of lipid modifying therapy or a documented untreated LDL ≥ 3.4 mmol/L, or HDL-C < 1.0 mmol/L for men and < 1.3 mmol/L for women, or triglycerides ≥ 2.3 mmol/L); or hypertension (use of blood pressure drug or untreated SBP ≥ 140 mm Hg or DBP ≥ 90 mmHg); central obesity

^{††} Stop DPP4i when starting a GLP1-RA

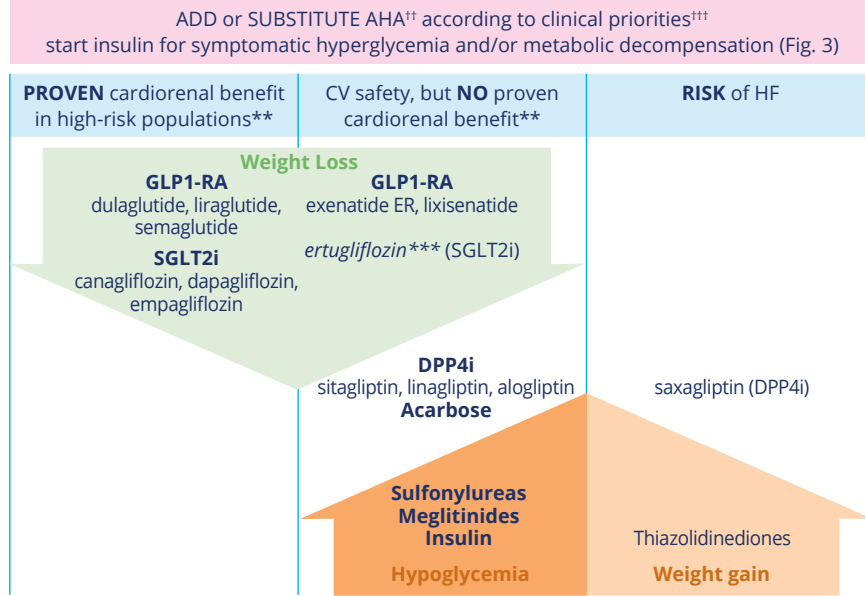
^{*} Initiate only if eGFR > 30 ml/min/1.73m²

Where additional glucose lowering is required (Fig. 2.2)

2020

†† All AHA's have Grade A evidence for effectiveness to reduce blood glucose levels

††† Consider degree of hyperglycemia, costs and coverage, renal function, comorbidity, side effect profile, and potential for pregnancy

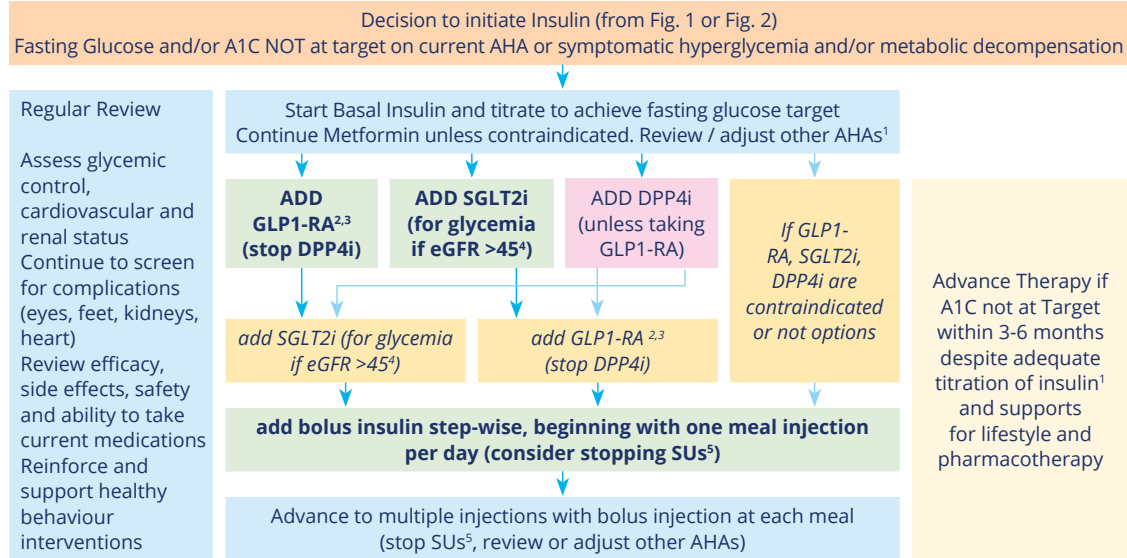


** In CV outcome trials performed in people with ASCVD, CKD, HF or at high CV risk

*** VERTIS (CV outcome trial for ertugliflozin) presented at ADA June 2020 showed non-inferiority for MACE. Manuscript not published at time of writing.

Starting or advancing insulin in type 2 diabetes (Fig. 3)

2020



1 titration of basal insulin to achieve FPG target without hypoglycemia

2 and titrate dose of GLP1-RA as tolerated

3 or fixed ratio combination

4 for cardiorenal benefit, SGLT2i may be initiated at eGFR >30 ml/min/1.73m² (and continued at lower eGFR depending on the SGLT2i)

5 sulfonylureas or meglitinides

Highest level of evidence Grade A Grade B Grade C or D

Which cardiovascular non-antihyperglycemic medications are indicated for my patient?

<p>Does the patient have cardiovascular disease?</p> <ul style="list-style-type: none"> - Cardiac ischemia (silent or overt) - Peripheral arterial disease - Cerebrovascular/carotid disease <p>NO</p>	YES	<p>Statin¹ + ACEi/ARB² + ASA³</p>
<p>Does the patient have microvascular disease?</p> <ul style="list-style-type: none"> - Retinopathy - Kidney disease (ACR \geq2.0) - Neuropathy <p>NO</p>	YES	<p>Statin¹ + ACEi/ARB²</p>
<p>Is the patient:</p> <ul style="list-style-type: none"> - age \geq55 with additional CV risk factors?⁴ 	YES	<p>Statin¹</p>
<ul style="list-style-type: none"> - age \geq40? - age \geq30 and diabetes >15 years? - warranted for statin therapy based on the Canadian Cardiovascular Society Lipid Guidelines? 	YES	

1 Dose adjustments or additional lipid therapy warranted if lipid target (LDL-C <2.0 mmol/L) not being met.

2 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]).

3 ASA should not routinely be used for the primary prevention of cardiovascular disease in people with diabetes. ASA may be used for secondary prevention. Consider clopidogrel if ASA-intolerant.

4 TC > 5.2 mmol/L, HDL-C < 0.9 mmol/L, hypertension, albuminuria, smoking.

For antihyperglycemic medications with CVD and/or cardiorenal benefits see Fig. 2.1

Keeping patients safe when they are at risk of dehydration (vomiting/diarrhea)

Re-hydrate appropriately (water, broth, diet soft drinks, sugar-free Kool-Aid™, diet Jell-O™; avoid caffeinated beverages).

Hold SADMANS meds. **Restart** once able to eat/drink normally.

- S** sulfonylureas, other secretagogues
- A** ACE-inhibitors
- D** diuretics, direct renin inhibitors
- M** metformin
- A** angiotensin receptor blockers
- N** non-steroidal anti-inflammatory drugs
- S** SGLT2 inhibitors

Special considerations regarding pregnancy for women with type 1 or type 2 diabetes

For women planning pregnancy, the following steps taken prior to conception:

- **A1C** 7% or less, but strive for \leq 6.5% (ensure contraception until at personalized target)
- **Stop:**
 - Non-insulin antihyperglycemic agents (except metformin and/or glyburide)
 - Statins
 - ACEi/ARB prior to pregnancy, but if overt nephropathy exists, continue until detection of pregnancy
- **Start:**
 - Folic acid 1 mg per day x 3 months prior to conception
 - Insulin if target A1C is not achieved on metformin and/or glyburide (type 2)
 - Other antihypertensive agents safe for pregnancy (Labetalol, nifedepine XL) if hypertension control needed
- **Screen for complications:**
 - Eye appointment, serum creatinine, urine ACR, blood pressure
- Aim for **healthy BMI**
- Ensure appropriate **vaccinations** have occurred
- **Refer** to diabetes clinic

Keeping people with diabetes safe when they are at risk of hypoglycemia:

For people using glyburide, gliclazide, repaglinide or insulin

Signs of hypoglycemia	Classification of hypoglycemia	Treatment*
Adrenergic (autonomic) <ul style="list-style-type: none"> • Trembling • Palpitations • Sweating • Anxiety • Hunger • Nausea • Tingling Neuroglycopenic <ul style="list-style-type: none"> • Difficulty concentrating • Confusion • Weakness • Drowsiness • Vision changes • Slurred speech • Headache • Dizziness 	Level 1 <ul style="list-style-type: none"> • Glucose level below normal (often between 3.0 and 3.9 mmol/L) • Associated with autonomic symptoms • Without neuroglycopenic symptoms or changes to mental status 	Level 1 or 2 hypoglycemia: <ul style="list-style-type: none"> • Ingest 15 g of carbohydrate, preferably as glucose or sucrose (i.e. tablets or solution). Glucose levels should be retested after 15 minutes and re-treated with another 15 g of carbohydrate if the glucose level remains <3.9 mmol/L Examples of 15 g of carbohydrate: <ul style="list-style-type: none"> • 4 x 4 g glucose tablets • 15 mL (3 teaspoons) or 3 packets of table sugar dissolved in water • 5 cubes of sugar • 150 mL juice or regular soft drink • 6 LifeSavers™ • 15 mL (1 tablespoon) honey
	Level 2 <ul style="list-style-type: none"> • Glucose level below normal (often <3.0 mmol/L) • Associated with neuroglycopenic symptoms • Without significant impact on mental status • With or without autonomic symptoms 	
	Level 3 <ul style="list-style-type: none"> • Glucose level below normal (regardless of glucose reading) • Associated with neuroglycopenic symptoms resulting in significantly altered mental/physical status • Requires assistance to treat 	Level 3 hypoglycemia: <ul style="list-style-type: none"> • Conscious: Treat with oral ingestion of 20 g of carbohydrate, preferably as glucose tablets or equivalent (if capable of swallowing) or 3 mg of glucagon intranasal or glucagon 1 mg SC/IM. Retreat with additional doses after 15 minutes if glucose level remains <3.9 mmol/L • Unconscious: Treat with glucagon (as above) or 10-25 g (20-50 mL of D50W) of glucose IV. Retreat with additional doses after 15 minutes if glucose level remains <3.9 mmol/L

* After treatment of hypoglycemia, consume usual meal or snack that is due at that time of the day. If a meal is >1 hour away, consume a snack (including 15 g carbohydrate and a protein source)

Reduce Driving Risk	<p>EDUCATE people at risk of hypoglycemia to drive safely with diabetes</p> <p>PREPARE Keep fast-acting sugar within reach and other snacks nearby</p> <p>BE AWARE of blood glucose (BG) before driving and every 4 hours during long drives. If BG is below 4 mmol/L, treat</p> <p>STOP driving and treat if any symptoms appear</p> <p>AFTER treating a low, WAIT until BG is above 5 mmol/L to start driving. Note: Brain function may not be fully restored for some time after blood glucose level returns to normal</p> <p>If a person has impaired awareness of hypoglycemia, he/she must check their BG before driving and every 2 hours while driving, or monitor glucoses with a real-time continuous glucose sensor</p>
Hypoglycemia Prevention Strategies	<p>Psychoeducational training</p> <ul style="list-style-type: none"> • Structured diabetes education programs focused on recognizing and reducing frequency of hypoglycemia <p>Choice of pharmacotherapy</p> <ul style="list-style-type: none"> • Avoid, reduce dose of, or discontinue pharmacotherapies associated with increased risk of hypoglycemia if appropriate • Consider long-acting analogues (insulin glargine-100, glargine-300, detemir, or degludec) over NPH insulin • Consider second-generation basal insulin analogues (insulin glargine-300 and degludec) over insulin glargine-100 and detemir to reduce the risk of hypoglycemia, including nocturnal hypoglycemia in type 1 and type 2 diabetes <p>Glucose monitoring</p> <ul style="list-style-type: none"> • Use of continuous glucose monitoring (CGM) and increased frequency of capillary blood glucose (CBG) monitoring to identify episodes of hypoglycemia <p>Surgical (for type 1 diabetes)</p> <ul style="list-style-type: none"> • Islet cell transplant • Pancreas transplant

Individualized goal setting

Potential Self-management Goals	Examples
Eat healthier	See a dietitian to help develop a healthy eating plan.
Be more active	Increase physical activity with the goal of getting to 150 minutes aerobic activity/week and resistance exercise 2-3 times/week. Choose physical activity that meets preferences/needs.
Lose weight	Use strategies (e.g., reduce calories or portions) to lose 5-10% of initial weight.
Take medication regularly	Taking medication will help to improve symptoms and take control of your life. Consider using a pillbox or setting a timer.
Avoid hypoglycemia	Recognize the signs of hypoglycemia and take action to prevent it.
Check blood glucose	Establish a routine and act accordingly.
Check feet	Do a daily self-check and follow-up with a health-care provider if anything is abnormal.
Manage stress	Screen for distress (depressive and anxious symptoms) by interview or a standardized questionnaire (e.g. PHQ-9 www.phqscreeners.com).
Reduce or stop smoking	Identify barriers to quitting and develop a plan to address each of these.

3 Quick questions to help your patients meet their goals

For patients who are not making expected progress, try asking these questions to identify a path forward:

1. How important is it for you to <insert self-management goal> - low, medium, or high?

- (Goal examples: increase levels of physical activity, reduce weight, improve A1C, lower BP)
- If importance (motivation) is rated low, ask what would need to happen for importance to go up?
- A high level of importance will indicate that the person is ready to change.

2. How confident are you in your ability to <insert target outcome here> - low, medium, or high?

- If their confidence is rated low, explore what needs to happen to increase their confidence. Usually this has to do with improving knowledge, skills or resources and support.
- A high level of confidence indicates that the person is ready to change.

3. Can we set a specific goal for you to try before the next time we meet?

What steps will you take to achieve it?

- Encourage S.M.A.R.T. Goals:

Specific **M**easurable **A**chievable **R**ealistic **T**imely

ABCDEs of diabetes care

2022

	GUIDELINE TARGET (or personalized goal)
A	A1C targets A1C \leq 7.0% (or \leq 6.5% to ↓ risk of CKD and retinopathy) If on insulin or insulin secretagogue, assess for hypoglycemia and ensure driving safety A1C 6.0 - <6.5% for selected adults with type 2 diabetes with potential remission to prediabetes A1C <6.0 for selected adults with type 2 diabetes with potential remission to normoglycemia
B	BP targets BP <130/80 mmHg If on treatment, assess for risk of falls
C	Cholesterol targets LDL-C <2.0 mmol/L (or >50 % reduction from baseline)
D	Drugs for CV and/or Cardiorenal protection (non-AHA) • ACEi/ARB (if CVD, age \geq 55 with risk factors, OR diabetes complications) • Statin (if CVD, age \geq 40 for type 2, OR diabetes complications) • ASA (if CVD) (Antihyperglycemic Agents) • SGLT2i/GLP1-RA with demonstrated cardiorenal benefits in high risk type 2 with ASCVD, CKD or HF, OR Age >60 with 2 CV risk factors
E	Exercise goals and healthy eating • 150 minutes of moderate to vigorous aerobic activity/ week and resistance exercises 2-3 times/week • Follow healthy dietary pattern (eg Mediterranean diet, low glycemic index)
S	Screening for complications • Cardiac: ECG every 3-5 years if age >40 OR diabetes complications • Foot: Monofilament/Vibration yearly or more if abnormal • Kidney: Test eGFR and ACR yearly, or more if abnormal • Retinopathy: type 1 - annually; type 2 - q1-2 yrs
S	Smoking cessation If smoker: Ask permission to give advice, arrange therapy and provide support
S	Self-management, stress, other barriers • Set personalized goals (see "individualized goal setting" panel) • Assess for stress, mental health and financial or other concerns that might be barriers to achieving goals