trc pharmacist's letter canada™

–This Clinical Resource gives subscribers additional insight related to the Recommendations published in–

PHARMACIST'S LETTER / PRESCRIBER'S LETTER

June 2018 ~ Resource #340630

trc prescriber's letter canada™

Stepwise Treatment of Type 2 Diabetes

(Recommendations from Diabetes Canada)

Information in algorithm/chart is from the *Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada* (reference 29) unless otherwise cited. The full guidelines are available at http://guidelines.diabetes.ca/docs/CPG-2018-full-EN.pdf.

Step 1: **At diagnosis[a] of type 2 diabetes in nonpregnant adults**

Lifestyle modification: healthy eating (e.g., DASH diet, Mediterranean style diet, etc), aerobic activity 150 min/week, resistance training two to three days/week, achievement of healthier weight.

Pharmacotherapy:

- Prediabetes: metformin
- **A1C <1.5% above individualized target**[b]: lifestyle modification with or without metformin for two to three months, then start or increase metformin if goal A1C not reached.
- **A1C ≥1.5% above individualized target**[b]: start metformin with or without another agent (see chart below).
  - **Symptomatic hyperglycemia or metabolic decompensation**: insulin monotherapy OR insulin plus metformin
- **Overweight**: consider adjunctive orlistat (*Xenical*).
- **Established cardiovascular disease; age ≥40 years; age >30 years with diabetes duration >15 years; or age <40 years with microvascular disease; or warrants statin per lipid guidelines**: add a statin

Step 2: Add another agent. (See chart below.) For patients with clinical cardiovascular disease, use a drug with cardiovascular benefit: empagliflozin, liraglutide, or canagliflozin [except in patients with amputation]). After giving priority to clinical cardiovascular disease, individualize choice based on degree of hyperglycemia, weight, comorbidities (e.g., heart failure, liver disease), medication side effects (e.g., hypoglycemia), patient preferences, and cost.

Step 3: Add an agent from a different class OR add or intensify insulin.

Goal: Reach target A1C (A1C ≤7% for most adults) in three to six months[b]

a. A1C of ≥6.5% is diagnostic of diabetes in adults. An A1C 6% to 6.4% indicates prediabetes.
b. Individualize. Aim for A1C ≤7% (fasting glucose 4 to 7 mmol/L) for most patients. Higher A1C goal (>7% to 8.5%) may be appropriate for some patients (e.g., limited life expectancy, functionally dependent, frailty, dementia, long-standing diabetes, advanced cardiovascular disease, severe hypoglycemic episodes, or hypoglycemic unawareness). Lower goal (≤6.5%) may be appropriate in some patients (e.g., newly diagnosed, long life expectancy, no advanced cardiovascular disease, low hypoglycemia risk, desire to reduce retinopathy or chronic kidney disease risk).

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Drug or Drug Class	**Expected A1C drop when added to metformin**	**Notable Adverse Effects**	**Comments**
Acarbose (*Glucobay*) (**Alpha-glucosidase inhibitor**)	0.7% to 0.8%	GI Low risk of hypoglycemia when used as monotherapy	Weight neutral Taken with meals[1] Not for initial therapy if A1C ≥8.5%[3] Reduces postprandial glucose[2]
Thiazolidinediones (TZD) (pioglitazone [e.g., *Actos*]) (**Insulin sensitizer**) (**November 2010**: Health Canada announced the restricted use of rosiglitazone-containing products [*Avandia*, etc] due to an increased risk of cardiovascular events. Restricted to patients for whom all other oral agents, as monotherapy or in combination, are ineffective or inappropriate. Requires informed consent.)[4]	0.8% to 0.9%	Low risk of hypoglycemia when used as monotherapy Edema, weight gain, heart failure (risk increased with insulin[5,6]), increased fracture risk, macular edema (rare), possibility of myocardial infarction with rosiglitazone (controversial) Pioglitazone contraindicated in patients with history of bladder cancer or uninvestigated macroscopic haematuria. Assess risk factors for bladder cancer and counsel patients to report haematuria, dysuria, or urinary frequency.[5]	Glycemic control better sustained over diabetes course than metformin or sulfonylurea[3] Pioglitazone increases HDL, reduces triglycerides, and increases LDL particle size[5] Contraindicated in heart failure (all stages [I to IV])[5,6]

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Drug or Drug Class	**Expected A1C drop when added to metformin**	**Notable Adverse Effects**	**Comments**
Insulin	0.9% to 1.2%, or more	Highest risk of hypoglycemia (educate patient to prevent, recognize, and manage) Highest risk of weight gain	Consider initial therapy with insulin plus metformin if blood glucose is ≥16.7 mmol/L and/or A1C is ≥10%[7] Usually start with basal insulin at bedtime
Meglitinides (repaglinide [e.g., *GlucoNorm*]) (**Insulin secretagogues**)	0.7% to 1.1%	Hypoglycemia (educate patient to prevent, recognize, and manage)	Three or four times daily dosing Can hold dose if skipping meal, to reduce risk of hypoglycemia[3] Consider over sulfonylureas (less hypoglycemia, better postprandial control) Less weight gain than sulfonylureas Relatively short-lived efficacy Discontinue when more complex insulin regimens (e.g., basal plus prandial insulins) are started
Metformin (e.g., *Glucophage*) (**Biguanide**)	1% (as monotherapy)	GI Low risk of hypoglycemia as monotherapy Lactic acidosis (rare) in patients with cardiovascular, renal, or hepatic dysfunction	Weight neutral Ameliorates insulin-associated weight gain[3] A first-line agent after diet and exercise Metformin can be **initiated** if eGFR is >45 mL/min/1.73 m^2.[8] Discontinue if eGFR later falls below 30 mL/min/1.73 m^2.[8,29] Inexpensive

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Drug or Drug Class	**Expected A1C drop when added to metformin**	**Notable Adverse Effects**	**Comments**
Alogliptin (*Nesina*), Linagliptin (*Trajenta*), Sitagliptin (*Januvia*), Saxagliptin (*Onglyza*) (**Dipeptidyl peptidase-4 [DPP-4] inhibitors**)	0.5% to 0.7%	Low risk of hypoglycemia as monotherapy May be associated with pancreatitis (rare) New or worsening heart failure (saxagliptin, alogliptin)[9] May cause severe joint pain[10]	Weight neutral Postprandial efficacy[3] Dosage modification with renal impairment needed with sitagliptin, saxagliptin, and alogliptin[11-13] CYP3A4 interactions with saxagliptin and linagliptin[12,14] Expensive
Sulfonylurea (e.g., glimepiride [e.g., *Amaryl*], glyburide [e.g., *Diabeta*], gliclazide [e.g., *Diamicron*]) (**Insulin secretagogues**)	0.7% to 1.3%	Hypoglycemia (educate patient to prevent, recognize, and manage) Weight gain (highest with glyburide[3])	Less hypoglycemia with glimepiride or gliclazide vs glyburide Tolbutamide rarely used Relatively short-lived efficacy Discontinue when more complex insulin regimens (e.g., basal plus prandial insulins) are started Inexpensive Avoid chlorpropamide in elderly or renal impairment[28]

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Drug or Drug Class	**Expected A1C drop when added to metformin**	**Notable Adverse Effects**	**Comments**
Canagliflozin (*Invokana*) Dapagliflozin (*Forxiga*) Empagliflozin (*Jardiance*) Ertugliflozin (*Steglatro*) (**Sodium glucose co-transporter 2 [SGLT2] inhibitor**) *Continued…*	0.4% to 0.7%	Increased serum creatinine.[16-18,30] Acute kidney injury reported with canagliflozin or dapagliflozin (may require dialysis).[15] Urinary tract infection (may be severe)[16-18,30] Genital fungal infections (male and female)[16-18,30] Increased urination Hypotension Hyperkalemia (canagliflozin)[11] Small LDL increase (0.1 to 0.2 mmol/L, or about 3%)[16-18,30] Dapagliflozin may increase risk of bladder cancer. Use with pioglitazone is not recommended.[17] Association with ketoacidosis (rare) May be associated with **acute** pancreatitis (rare).[31,33] Rare cases of Fournier's gangrene in men and women, with onset early (days) and late in therapy (~2 years).[32] Fractures and decrease in	Weight loss 2 to 3 kg[16-18,30] Systolic blood pressure reduction 3 to 5 mmHg[16-18,30] Low risk of hypoglycemia with monotherapy Canagliflozin and ertugliflozin are contraindicated if eGFR <45 mL/min/1.73m^2; do not start if eGFR <60 mL/min/1.73m^2.[16,30] Canagliflozin max dose is only for patients with eGFR ≥60 mL/min/1.73 m^2 and a low risk of harm due to volume depletion.[16] Dapagliflozin contraindicated if eGFR <60 mL/min/1.73m^2.[17] Empagliflozin contraindicated if eGFR <30 mL/min/1.73m^2.[25] Canagliflozin may increase digoxin levels. May require dose increase with enzyme inducers.[16] Not recommended in severe hepatic impairment[16-18,30] When used as an add-on, consider insulin/sulfonylurea/meglitinide dose reduction[16-18,30] Risk factors for acute kidney injury include use of NSAIDs, ACEIs, ARBS, or diuretics, or reduced blood volume, chronic kidney disease, and heart failure.[15] Empagliflozin reduces cardiovascular mortality (NNT = 45 for three years), overall mortality (NNT = 39 for three years), and hospitalization due to heart failure (NNT = 71 for three years) in type 2 diabetes patients with cardiovascular disease.[24] [Evidence level A-1].[22] CANVAS (CANagliflozin cardioVascular Assessment Study) [Evidence level A-1] found canagliflozin use for about 3.5

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Drug or Drug Class	Expected A1C drop when added to metformin	Notable Adverse Effects	Comments
SGLT2 inhibitors, continued.		BMD (canagliflozin).[16] Dapagliflozin is also linked to fractures in patients with moderate renal impairment.[17] Amputations may occur in about 6 of every 1,000 patients treated with canagliflozin over one year, compared to about 3 in every 1,000 patients on other diabetes meds.[19,20] Canagliflozin use in patients at high CV risk for about 3.5 years may increase risk of amputations, NNH ~77 [Evidence level A-1].[19,21]	years when added to standard glucose-lowering therapy in patients with type 2 diabetes and very high CV risk (>70% of patients had atherosclerotic CV disease), may reduce the combined endpoint of CV mortality, nonfatal MI, or nonfatal stroke (NNT=224). However, when evaluated individually, these endpoints were no longer significantly reduced.[19]
Dulaglutide (*Trulicity*), Liraglutide (*Victoza*), Lixisenatide (*Adlyxine*), Exenatide (*Byetta*, *Bydureon*), Semaglutide (*Ozempic*) (**Glucagon-like peptide-1 [GLP-1] agonists**) Also see our chart, *Comparison of GLP-1 Agonists*.	1% (See GLP-1 agonist chart for individual agents)	GI Low risk of hypoglycemia as monotherapy Reports of pancreatitis (rare)[23] Associated with renal insufficiency[23] May be associated with gallbladder disease (liraglutide, exenatide)[24] May lead to retinopathy complications (semaglutide)[25]	Weight loss Postprandial efficacy[3] More weight loss and efficacy than DPP-4 inhibitors Expensive Injectable Liraglutide may reduce cardiovascular death (NNT = 77 for four years) and overall mortality (NNT = 71 for four years) in patients with high cardiovascular risk or cardiovascular disease [Evidence level A-1].[26] Semaglutide use in patients with CV disease, chronic kidney disease, or CV risk factors for about two years may reduce the combined endpoint of CV death, nonfatal MI, or nonfatal stroke (NNT=44) [Evidence level A-1].[27] When evaluated individually, only nonfatal stroke was significant.[27]

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Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.

Levels of Evidence

In accordance with our goal of providing Evidence-Based information, we are citing the **LEVEL OF EVIDENCE** for the clinical recommendations we publish.

Level	Definition	Study Quality
A	Good-quality patient-oriented evidence.*****	1. High-quality RCT 2. SR/Meta-analysis of RCTs with consistent findings 3. All-or-none study
B	Inconsistent or limited-quality patient-oriented evidence.*****	1. Lower-quality RCT 2. SR/Meta-analysis with low-quality clinical trials or of studies with inconsistent findings 3. Cohort study 4. Case control study
C	Consensus; usual practice; expert opinion; disease-oriented evidence (e.g., physiologic or surrogate endpoints); case series for studies of diagnosis, treatment, prevention, or screening.	

***Outcomes that matter to patients** (e.g., morbidity, mortality, symptom improvement, quality of life).
RCT = randomized controlled trial; **SR** = systematic review
[Adapted from Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *Am Fam Physician* 2004;69:548-56. http://www.aafp.org/afp/2004/0201/p548.pdf.]

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Evidence and Recommendations You Can Trust…

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March 2019 ~ Resource #350304

Improving Diabetes Outcomes

Below is our toolbox of practical tips and resources to help improve outcomes in your patients with diabetes, with a focus on nonpregnant **adults**.

Guidelines from the ADA and Diabetes Canada are available at:

- ADA: http://care.diabetesjournals.org/content/diacare/suppl/2018/12/17/42.Supplement_1.DC1/DC_42_S1_Combined_FINAL.pdf
- Diabetes Canada: http://guidelines.diabetes.ca/docs/CPG-2018-full-EN.pdf

Abbreviations: ABI = ankle-brachial index; ACC = American College of Cardiology; ACEI = angiotensin-converting enzyme inhibitor; ADA = American Diabetes Association; AHA = American Heart Association; ARB = angiotensin receptor blocker; ASCVD = atherosclerotic cardiovascular disease; CCS = Canadian Cardiovascular Society; DC = Diabetes Canada; CV = cardiovascular; eGFR = estimated glomerular filtration rate; ISH = International Society of Hypertension; JNC8 = Eighth Joint National Committee; SGLT2 = sodium-glucose cotransporter 2 (flozins).

Goal	Suggested Strategies or Resources
Set an appropriate **A1C target**.	• Recommend an A1C <7% (ADA) or ≤7% (DC) in many patients with diabetes to reduce complications.[1,2] • Select less stringent targets, such as <8% (ADA) or ≤8.5% (DC), in certain diabetes patients such as those at risk for severe hypoglycemia, with limited life expectancy, or with advanced vascular complications.[1,2] • Select more stringent targets, such as <6.5% (ADA) or ≤6.5% (DC), to further reduce the risk of microvascular complications when the benefit outweighs the risk of hypoglycemia.[1,2] • Diabetes Canada has an online tool providers can use to individualize your patient's A1C target at http://guidelines.diabetes.ca/reduce-complications/a1ctarget. • Read about *A Personalized Approach for A1C Goals*.
Choose the **most appropriate agent(s)** to achieve the A1C target. *Continued…*	• Start with **metformin** in most patients with type 2 diabetes without severe renal impairment.[1,2] (U.S.: do not start if eGFR <45 mL/min/1.73 m^2).[1] Metformin has negligible risk of hypoglycemia, does not cause weight gain, and may reduce cardiovascular risk.[1,2] – See our commentary, *Clinical Use of Metformin in Special Populations*, for details on metformin use in renal impairment, heart failure, and liver impairment. – Metformin is associated with **B12 deficiency**. Consider checking levels periodically (every two to three years), especially in patients with anemia or neuropathy (Canada: check every one to two years).[1,13,14] For details on monitoring, diagnosis, and treatment, see our commentary, *Management of Vitamin B12 Deficiency*. • Add meds to metformin for patients with type 2 diabetes based on A1C lowering, side effects, and cost.[1,2]

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<table>
<tr><th>Goal</th><th>Suggested Strategies or Resources</th></tr>
<tr><td>Choose the most appropriate agent(s) to achieve the A1C target, continued</td><td>
<table>
<tr><th>Drug Class</th><th>Consider for…[9,19]</th><th>Avoid or Use Caution in…[1,2,4,9,19]</th></tr>
<tr><td>SGLT2 inhibitor</td><td>CV disease risk,* heart failure, overweight</td><td>Renal impairment, diuretic use, risk factors for amputation, history of genital fungal infections, fracture risk</td></tr>
<tr><td>GLP-1 Agonists</td><td>CV disease risk,* overweight</td><td>Personal or family history of medullary thyroid cancer or multiple endocrine neoplasia type 2</td></tr>
<tr><td>Sulfonylurea</td><td>Cost concerns</td><td>Hypoglycemia risk, overweight</td></tr>
<tr><td>Insulin</td><td>High A1C</td><td>Hypoglycemia risk, overweight[9]</td></tr>
<tr><td>Glitazone</td><td>High triglycerides, CV risk</td><td>Heart failure, risk of bladder cancer, patients on insulin</td></tr>
<tr><td>DDP-4 Inhibitor</td><td>Post-prandial effect desired, overweight</td><td>Heart failure (saxagliptin, alogliptin)</td></tr>
<tr><td>α-glucosidase inhibitor</td><td>Post-prandial effect desired, overweight</td><td>A1C ≥8.5%</td></tr>
</table>
*In patients with clinical cardiovascular disease, consider empagliflozin, canagliflozin, liraglutide, or semaglutide.[1,2] They reduce major CV events when added to standard care in patients with CV disease or high CV risk (liraglutide, canagliflozin, semaglutide),[1] including all-cause and CV mortality (empagliflozin, liraglutide).[1] See our chart, Diabetes Medications and Cardiovascular Impact, for details on study outcomes for each agent.

• When goals aren't met, scrutinize the patient's med list for Drugs That Significantly Increase Blood Glucose.
• For more information on drug therapy for type 2 diabetes, see our resources:
• Management of New-Onset Type 2 Diabetes
• Drugs for Type 2 Diabetes (U.S. subscribers)
• Stepwise Treatment of Type 2 Diabetes (Canadian subscribers)
• Initiation and Adjustment of Insulin Regimens for Type 2 Diabetes (U.S. subscribers, Canadian subscribers)
• How to Switch Insulin Products (U.S. subscribers, Canadian subscribers)
• Comparison of Insulins (U.S. subscribers, Canadian subscribers)
• Insulin Analogs vs Human Insulin
• Insulin Pumps: What You Need to Know
</td></tr>
<tr><td>Ensure safe use of diabetes meds.</td><td>• New insulin concentrations and products can create confusion. For strategies and resources to help prevent errors with insulin, see our chart, Tips to Improve Insulin Safety.
• Give patients our patient education handout, How to Handle Low Blood Sugar (U.S. subscribers, Canadian subscribers).
• For notable adverse effects of flozins, glitazones, and more, see our charts, Drugs for Type 2 Diabetes (U.S. subscribers) and Stepwise Treatment of Type 2 Diabetes (Canadian subscribers).</td></tr>
</table>

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Goal	Suggested Strategies or Resources
Use a **statin** when appropriate.	• Use a statin for **primary prevention** for most diabetes patients 40 years of age and older.[5,6] • **AHA/ACC**:[5] • Statins are indicated for adults 40 to 75 years of age with diabetes and an LDL ≥70 mg/dL • In adults 20 to 39 years of age with diabetes that is longstanding (≥10 years for type 2 or ≥20 years for type 1), albuminuria (≥30 mcg/mg creatinine), eGFR <60 mL/min/1.73 m^2, ABI <0.9, retinopathy, or neuropathy, starting a statin may be reasonable. • In patients >75 years of age with diabetes, continuing or even starting a statin may be reasonable after a risk/benefit discussion. • **CCS**: statins are indicated for diabetes and age ≥40 years, or diabetes >15 years' duration and age ≥30 years, or diabetes with microvascular disease.[6] • A statin is indicated for secondary prevention in patients with diabetes and ASCVD.[5,6] • For a complete list of statin indications, see our charts, *2018 ACC/AHA Cholesterol Guidelines* (U.S. subscribers) or *Canadian Cardiovascular Society Dyslipidemia Recommendations* (Canadian subscribers). • For more information on choosing and using a statin, see our charts: • *Characteristics of the Various Statins* • *Statin Dose Comparison* • To help promote safe statin use, give patients our patient education handout, *What You Should Know About Statins*.
Meet an appropriate **blood pressure goal**.	• Aim for a BP <140/90 mmHg in most diabetes patients (JNC 8, ISH, ADA).[1,7] The ADA states that a target of <130/80 mmHg may be suitable for patients with CV disease or 10-year CV risk >15% if it can be safely achieved.[1] ACC/AHA guidelines recommend a BP of <130/80 mmHg for most patients in general,[7] and Canadian guidelines (DC, CCS) recommend a goal of <130/80 mmHg for most patients with diabetes.[2,8] • Pharmacotherapy should include an antihypertensive shown to reduce CV events in diabetes patients: ACEI, ARB, thiazide-like diuretic, or dihydropyridine calcium channel blocker.[1,2,8] (ISH guidelines give preference to ACEI or ARB in non-black patients.[7]) • For more information about blood pressure goals and choosing appropriate antihypertensives, see our resources: • *Treatment of Hypertension* (U.S. subscribers) • *Stepwise Treatment of Hypertension* (Canadian subscribers) • Help pharmacy technicians brush up on treatment of high blood pressure with our technician tutorial, *Hypertension 101*. • Give patients our patient education handout, *Blood Pressure Medications and You.*

More. . .

Goal	Suggested Strategies or Resources
Choose safe and effective treatment for patients with concomitant **heart failure.**	• Choose **metformin** first for most heart failure patients with type 2 diabetes.[1,2,4] Hold if patient becomes unstable (e.g., acute heart failure exacerbation), or eGFR <30 mL/min/1.73 m^2, due to rare risk of lactic acidosis.[1,4] Preliminary evidence suggests that metformin may improve outcomes (e.g., reduced hospitalization and mortality).[1,20] • **SGLT2 inhibitors** are second-line agents.[1,2] Empagliflozin, canagliflozin, and dapagliflozin have been shown to reduce heart failure hospitalization in patients with CV disease (and high CV risk [canagliflozin]).[1,15,16] • Studies are underway to determine SGLT2 inhibitor benefits specifically in patients with heart failure with reduced ejection fraction and heart failure with preserved ejection fraction.[4] • Be aware that SGLT2 inhibitors may cause volume depletion in patients taking a diuretic.[1] Do not start an SGLT2 inhibitor if eGFR <45 mL/min/1.73m^2 (canagliflozin, empagliflozin) or <60 mL/min/1.73m^2 (dapagliflozin, ertugliflozin).[1,2,17,18] • **GLP-1 agonists** can be used in heart failure, but do not seem to specifically benefit heart failure (i.e., neutral effect).[1,2] Concerns have been raised about increased heart rate in heart failure patients in some studies.[4] • **Sulfonylureas** and **insulin** appear to have a neutral effect.[1,4] • **Saxagliptin**, and **alogliptin** have been associated with heart failure hospitalization.[4] For more on gliptins and heart failure, see our commentary, *DPP-4 inhibitors (Gliptins) and Risk of Heart Failure*. • **Glitazones** are associated with fluid retention and increased risk of heart failure and heart failure hospitalization, and should be avoided in patients with (symptomatic [ADA]) heart failure .[1,2,4] • Patients with diabetes are at increased risk of renal impairment and hyperkalemia due to renin-angiotensin-aldosterone system blockade. In patients with eGFR <60 mL/min/1.73 m2 and/or using s**pironolactone** or **eplerenone**, consider starting their **ACEI** or **ARB** at half-dose; checking electrolytes, renal function, blood pressure, and heart failure symptoms within seven to ten days of initiation or dosage increase; and increasing the dose cautiously.[2] • **Beta-blockers** reduce morbidity and mortality in patients with heart failure with reduced ejection fraction and diabetes.[4] They do not seem to worsen glycemic control, and hypoglycemic unawareness was not reported in clinical trials.[4]
Start **low-dose aspirin** if appropriate.	• Use low-dose aspirin (e.g., 81 mg/day) in diabetes patients for **secondary prevention** in patients with a history of atherosclerotic cardiovascular disease (e.g., heart attack, stroke).[1,2] • Aspirin's benefit for **primary prevention** in patients with diabetes appears similar to that of the general population, and is controversial.[1,10] Low-dose aspirin could be considered for primary prevention in diabetes patients ≥50 years of age with at least one major risk factor (family history, hypertension, smoking, kidney disease, dyslipidemia) and low bleeding risk, after a risk/benefit discussion (ADA).[1] Patients >70 years of age, risk appears greater than benefit.[1] Similarly, Diabetes Canada does not recommend routine use.[2] • Get more information on the evidence regarding low-dose aspirin benefits and risks from our chart, *Aspirin for CV Primary Prevention and More*. • Give patients our handout, *Aspirin and Your Heart*.

More. . .

Goal	Suggested Strategies or Resources
Make sure patients are up-to-date on **vaccines**.	• People with diabetes should receive immunizations per the latest immunization schedule recomendations.[1,2] Encourage administration of pneumococcal vaccine, influenza vaccine, hepatitis B (ADA), and herpes zoster (DC) vaccine to patients with diabetes.[1,2] • **ADA**: Annual vaccination against **influenza** is recommended for all persons ≥6 months of age.[1] Vaccination against **pneumonia** with pneumococcal polysaccharide vaccine (PPSV23; *Pneumovax 23*) is recommended for people with diabetes two through 64 years of age. In children, complete the pneumococcal conjugate vaccine (PCV13; *Prevnar 13*) series before age two years.[1] For immunocompetent patients ≥65 years give **one** dose of PCV13 (if not previously given and 1 year has passed since any previous PPSV23 dose), then PPSV23 ≥1 year after PCV13 and ≥5 years after the last dose of PPSV23.[3] Give the **hepatitis vaccine** series to unvaccinated adults with diabetes who are age 19 to 59 years. Also consider the hepatitis B vaccine series for unvaccinated adults with diabetes who ≥60 years of age.[1] • **Diabetes Canada**: For adults, give **influenza** vaccine annually.[2] Vaccination against **pneumonia** with pneumococcal polysaccharide vaccine (PPSV23) should be offered to adults 19 to 64 years of age.[2] For those ≥65 years give **one** dose of PPSV23, provided five years have elapsed since any dose given at age <65 years.[2] For patients ≥65 years of age, PCV13 can also be considered (if not previously given) at least one year after any previous PPSV23 dose, then a one-time PPSV23 dose ≥8 weeks after PCV13, allowing five years to elapse since any PPSV23 dose given at age <65 years.[2] Give the herpes zoster vaccine to adults ≥60 years of age.[2] • Immunization schedules can be found at http://www.cdc.gov/vaccines/schedules/hcp/adult.html (U.S.; adults ≥19 years of age), https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html (U.S.; ages ≤18 years), and http://www.phac-aspc.gc.ca/publicat/cig-gci/p03-chroni-eng.php#a7 (Canada; immunizations for persons with chronic diseases).
Ensure patients stay on appropriate medications through **transitions of care**.	• Use our *Transitions of Care Checklist* at admission, at transfer between units at the same facility, and at the patient's first post-admission outpatient visit to keep patients on track with their medications and out of the hospital. • For tips of reducing bouncebacks, see our toolbox, *Reducing Hospital Readmissions*. • Use the toolbox from AHRQ to optimize medication reconciliation (http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/match.pdf). • Pharmacy technicians can learn to assist patients with med lists using our technician tutorial, *Mastering Medication Lists and Histories.*
Help improve **medication adherence**. *Continued…*	• Tailor medication regimens and educate patients with diabetes to help them adhere. • See our resources on improving adherence: • *Medication Adherence Strategies* toolbox • *Conversation Starter: Med Adherence Quick Guide* • *Guide for Helping Patients Afford Their Medications* (U.S. subscribers) • *Strategies for Communicating Effectively with Patients* (pharmacist CE)

More. . .

Goal	Suggested Strategies or Resources
Help improve **medication adherence**, continued	• *Using Motivational Interviewing to Create Change* (pharmacist CE) • When patients are part of the decision-making process, they are more likely to be adherent. Most conditions have several reasonable treatment options, each carrying a different balance of risks and benefits. In these situations, "shared decision making," which involves providing balanced information on the benefits and risk of each option, can be used.[11] • An online diabetes decision aid to use with your patients is available from the Mayo Clinic at https://diabetesdecisionaid.mayoclinic.org. • Use our resources to help educate diabetes patients about the need to tailor their medication regimens in specific situations: • *Sick Day Management of Diabetes* • Patient education handout, *How to Manage Sick Days with Diabetes* (U.S. subscribers, Canadian subscribers)
Prevent and manage **diabetes complications**.	• See our resources: • *Pharmacotherapy of Neuropathic Pain* • *Diabetic Foot Infections* • *Management of Albuminuria: Focus on Pharmacotherapy*
Use **self-monitoring of blood glucose** appropriately.	• Recommend self-monitoring of blood glucose for patients who can benefit, such as those with type 1 diabetes, those with type 2 diabetes treated with insulin, or those with poorly controlled type 2 diabetes.[1,2] • In type 2 patients not taking hypoglycemic agents, multiple daily self-monitoring is not necessary except when therapy adjustments may be needed (e.g., acute illness, poor control, new meds, etc).[12] • For more information about self-monitoring of blood glucose, see our resources: • *Comparison of Blood Glucose Meters* (U.S. subscribers, Canadian subscribers) • *Lancets and Lancing Devices* (U.S. subscribers, Canadian subscribers) • Give patients our handout: *Understanding Your Blood Sugar Numbers* (U.S. subscribers, Canadian subscribers).
Educate patients about **diet, exercise, and other lifestyle changes**. *Continued…*	• Encourage beneficial lifestyle changes such as maintaining a healthy weight, smoking cessation, and regular physical activity for diabetes patients.[1,2] • Diabetes is best-managed by a multidisciplinary care team.[1.2] To find an accredited diabetes education program, go to https://www.diabeteseducator.org/living-with-diabetes/find-an-education-program (U.S.) • Consider referral to a registered dietitian.[1,2] To find a registered dietitian, go to http://www.eatright.org/programs/rdfinder/. • For more information on beneficial lifestyle changes for patients with diabetes, see our resources: • *Weight Loss: Helping Your Overweight and Obese Patients* • *Lifestyle Changes to Reduce Cardiovascular Risk* • *Smoking Cessation: Helping Patients Who Use Tobacco*

More. . .

Goal	Suggested Strategies or Resources
Educate patients about **diet, exercise, and other lifestyle changes**, continued	• *Smoking Cessation Drug Therapy* • *Tackling a Growing Problem: Childhood Obesity* (pharmacist, technician CE) • *Pharmacotherapy for Smoking Cessation* (pharmacist CE) • *The Pharmacist's Role in Promoting Tobacco Cessation* (pharmacist CE) • Give patients our patient education handouts to take home: • *Tips for Getting to a Healthy Weight* • *How to Eat a Heart-Healthy Diet* • *How to Kick the Smoking Habit* • *Have Diabetes? Take Care of Your Feet!*
Help schedule **screenings** as appropriate.	• Encourage adults with type 2 diabetes to schedule eye exams at least every two years (or at least every year if there is evidence of retinopathy), get screened for nephropathy annually, get screened for neuropathy annually, and get comprehensive foot exams at least annually.[1,2] • Give patients our patient education handout to take home: *Have Diabetes? Take Care of Your Feet!*
Learn about **quality measures**.	• Learn more about quality measures for patients with diabetes from our toolbox: • *Quality Measures for Pharmacies* (U.S. subscribers)
Use **medication therapy management (MTM)** to optimize treatment for patients with diabetes (U.S. pharmacists).	• Medicare Part D patients with diabetes are eligible for MTM. • U.S. pharmacists can use our conversation starter, *Improving Diabetes Care*, as a guide when talking with diabetes patients during medication reviews or other patient interactions. • For more information on MTM, see our resources: • *Medication Therapy Management* (U.S. subscribers) • *MTM in the Community Pharmacy: Comprehensive Medication Reviews* (pharmacist CE [U.S.]) • *MTM in the Community Pharmacy: Targeted Interventions* (pharmacist CE) • Use our technician tutorials to engage pharmacy technicians in the process of MTM: • *Diabetes 101* • *Dispensing Insulin and Other Injectable Diabetes Meds* • *Patient Profiles 101* • *Optimizing Pharmacy Workflow*

Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.

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