



## Cardiovascular Disease and Chronic Kidney Disease Risk Management in People with Diabetes

### Pillars of Risk Reduction

Atherosclerotic cardiovascular disease (ASCVD) and chronic kidney disease (CKD) are leading and related causes of disease and death in individuals with diabetes. Conditions commonly coexisting with type 2 diabetes (e.g., hypertension and dyslipidemia) increase the risk of these complications, as does diabetes itself. A comprehensive approach to reducing the risks of diabetes-related complications is recommended. Management of glycemia, blood pressure and lipids and the use of drug therapies with cardiovascular and kidney benefits are the pillars of risk reduction, on a foundation of lifestyle modification and diabetes education.

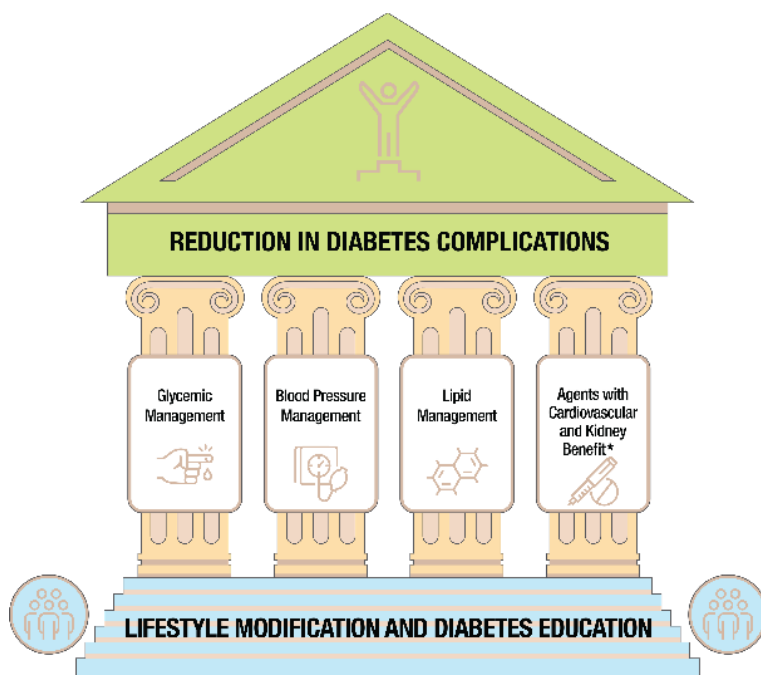


Figure 1: Multifactorial approach to reduction in risk of diabetes complications. \*Risk reduction interventions to be applied as individually appropriate.

# Blood Pressure Management in People with Diabetes

- Lifestyle modification includes weight loss when indicated, a healthful eating pattern with reduced sodium and increased potassium intake, moderation of alcohol intake and increased physical activity.
- Drug therapy should be started if blood pressure is persistently  $>130/80$  mmHg. The general treatment target is blood pressure  $<130/80$  mmHg. However, this target should be individualized based on patients' cardiovascular risk, potential for adverse effects of medications and preferences.
- The following algorithm depicts the recommendations for pharmacological therapy to manage blood pressure.

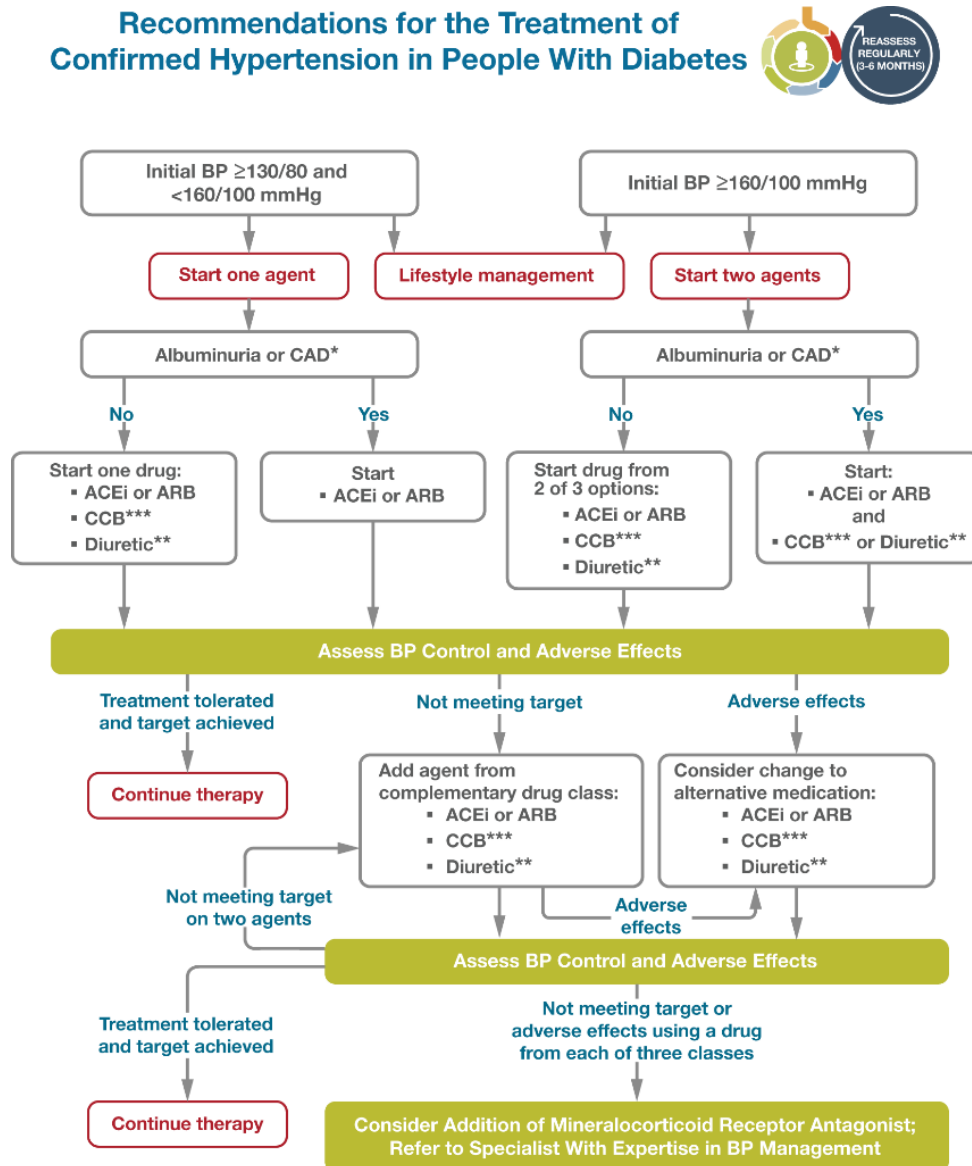


Figure 2: Recommendations for the treatment of confirmed hypertension in people with diabetes. \*An ACE inhibitor (ACEi) or angiotensin receptor blocker (ARB) is suggested to treat hypertension for people with coronary artery disease (CAD) or urine albumin-to-creatinine ratio 30–299 mg/g creatinine and strongly recommended for individuals with urine albumin-to-creatinine ratio  $\geq 300$  mg/g creatinine. \*\*Thiazide-like diuretic; long-acting agents shown to reduce cardiovascular events, such as chlorthalidone and indapamide, are preferred. \*\*\*Dihydropyridine calcium channel blocker (CCB). BP, blood pressure. Adapted from de Boer IH, Bangalore S, Benetos A, et al. Diabetes Care 2017;40:1273–1284.

## Lipid Management in People with Diabetes

- Lifestyle modification includes weight loss when indicated, a healthful eating pattern with reduced saturated and trans fats and increased n-3 fatty acids, viscous fiber and plant stanols/sterols and increased physical activity.
- Consider statin therapy for primary prevention as follows:
  - In people <40 years of age with other ASCVD risk factors, make a shared decision based on the risks/benefits of moderate-intensity statin therapy.
  - In people 40–75 years of age with no ASCVD, prescribe a moderate-intensity statin.
  - In people 40–75 years of age with high ASCVD risk, prescribe a high-intensity statin with an LDL cholesterol target of <70 mg/dL.
- For secondary prevention in all age groups, prescribe a high-intensity statin with an LDL cholesterol target of <55 mg/dL.
- People taking high-intensity statins for either primary or secondary prevention may also require ezetimibe or a PCSK9 inhibitor to reach their LDL cholesterol target.

Table 1: High-Intensity and Moderate-Intensity Statin Therapy\*

High-Intensity Statin Therapy (Lowers LDL Cholesterol by ≥50%)	(Lowers LDL Cholesterol by 30–49%)
<ul style="list-style-type: none"><li>• Atorvastatin 40–80 mg</li><li>• Rosuvastatin 20–40 mg</li></ul>	<ul style="list-style-type: none"><li>• Atorvastatin 10–20 mg</li><li>• Rosuvastatin 5–10 mg</li><li>• Simvastatin 20–40 mg</li><li>• Pravastatin 40–80 mg</li><li>• Lovastatin 40 mg</li><li>• Fluvastatin XL 80 mg</li><li>• Pitavastatin 1–4 mg</li></ul>

\*Once-daily dosing. XL, extended release.

# Glycemic Management in People with Diabetes

- Glucose management in type 1 diabetes requires multiple daily insulin injections or insulin pump therapy.
- In type 2 diabetes, drug therapy for glucose management should be guided by person-centered factors, including the risk for or presence of comorbidities and individualized treatment goals. Clinicians should also consider the efficacy, hypoglycemia risk, weight effects, cost/availability, and potential side effects of all therapy options, as well as patients' preferences.
- In people with established or high risk of ASCVD, heart failure and/or chronic kidney disease, treatment should include agents that reduce cardiorenal risk.
- Use a sodium–glucose cotransporter 2 (SGLT2) inhibitor and/or glucagon-like peptide 1 (GLP-1) receptor agonist with demonstrated cardiovascular disease benefit as part of the glucose-lowering regimen and for comprehensive cardiovascular risk reduction independent of A1C.

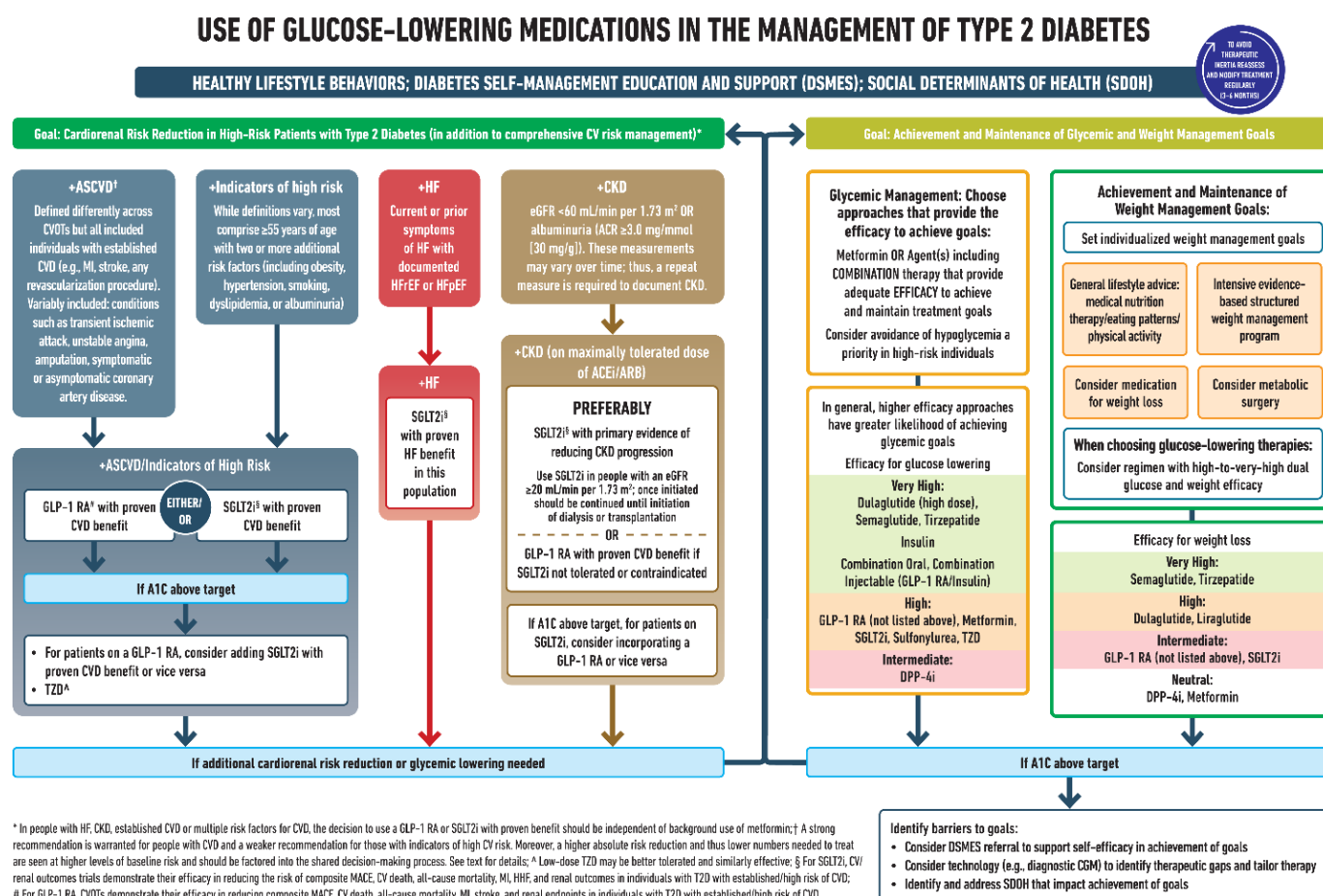


Figure 3: Use of glucose-lowering medications in the management of type 2 diabetes. ACEi, angiotensin-converting enzyme inhibitor; ACR, albumin-to-creatinine ratio; ARB, angiotensin receptor blocker; ASCVD, atherosclerotic cardiovascular disease; CGM, continuous glucose monitoring; CKD, chronic kidney disease; CV, cardiovascular; CVD, cardiovascular disease; CVOT, cardiovascular outcomes trial; DPP-4i, dipeptidyl peptidase 4 inhibitor; eGFR, estimated glomerular filtration rate; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HF, heart failure; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; HHF, hospitalization for heart failure; MACE, major adverse cardiovascular events; MI, myocardial infarction; SGLT2i, sodium-glucose cotransporter 2 inhibitor; T2D, type 2 diabetes; TZD, thiazolidinedione. Adapted from Davies MJ, Aroda VR, Collins BS, et al. Diabetes Care 2022;45:2753–2786.

## Additional Risk Reduction Strategies

- In people with ASCVD, particularly coronary artery disease, an ACE inhibitor or angiotensin receptor blocker (ARB) therapy is recommended to reduce the risk of cardiovascular events.
- For people with type 2 diabetes and CKD with albuminuria treated with maximum tolerated doses of ACE inhibitor or ARB, the addition of finerenone is recommended to improve cardiovascular outcomes and reduce the risk of CKD progression.
- In people with type 2 diabetes and CKD, consider combination therapy with an SGLT2 inhibitor (if estimated glomerular filtration rate [eGFR] is  $\geq 20$  mL/min/1.73 m<sup>2</sup>) and a GLP-1 receptor agonist or finerenone (if eGFR is  $\geq 25$  mL/min/1.73 m<sup>2</sup>) additionally for risk reduction.
- Use aspirin therapy (75–162 mg/day) for secondary prevention in people with diabetes and ASCVD; use clopidogrel (75 mg/day) for those with aspirin allergy.

## References

ElSayed NA, Aleppo G, Aroda VR, et al.; American Diabetes Association. 9. Pharmacologic approaches to glycemic treatment: *Standards of Care in Diabetes—2023*. *Diabetes Care* 2023;46(Suppl. 1):S140–S157

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