

# Hypertension and Diabetes: Addressing Common Comorbidities

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**A**therosclerotic cardiovascular disease (ASCVD) is the leading cause of morbidity and mortality in patients with diabetes.<sup>1</sup> ASCVD is defined by the American College of Cardiology and the American Heart Association (ACC/AHA) as acute coronary syndrome, myocardial infarction, stable or unstable angina, coronary or other arterial revascularization, stroke, transient ischemic attack, or peripheral arterial disease presumed to be of atherosclerotic origin.<sup>2</sup> Risk factors for ASCVD include hypertension, dyslipidemia, smoking, family history of premature coronary disease, chronic kidney disease, and albuminuria.<sup>3</sup>

Hypertension, a modifiable risk factor, is prevalent in patients with diabetes. Multiple studies have shown that antihypertensive therapy in these patients reduces ASCVD events; therefore, blood pressure control is necessary.<sup>1,3</sup> The American Diabetes Association's (ADA) 2018 *Standards of Medical Care in Diabetes* offers guidance on the assessment and treatment of hypertension in patients with diabetes—including the organization's position statement on hypertensive treatment with comorbid diabetes.<sup>1,3</sup> These guidelines are relevant and useful to both primary care and specialty providers who manage these complex patients.

## SCREENING AND DIAGNOSIS

Every clinical care visit for patients with diabetes should include a blood pressure measurement. (Evaluation for orthostatic hypotension should also be performed at the initial visit, to help guide future treatment.<sup>1</sup>) For accuracy, blood pressure should be assessed

- By a trained individual using the appropriate size cuff
- In both arms on the initial visit
- With the patient seated, with feet on the floor and arm at heart level
- After five minutes of rest

- With two to three readings taken one to two minutes apart and results averaged.<sup>1</sup>

If blood pressure is found to be elevated and the patient has no known history of hypertension, the elevated blood pressure should be reassessed on another visit within one month to confirm the diagnosis.<sup>1</sup> Patients should also monitor blood pressure at home to distinguish between white coat and masked hypertension.<sup>1</sup> Home blood pressures should be measured with arm cuffs that are the appropriate size. The bladder of the cuff should encircle 80% of the arm, should not cover clothing, and should be placed on the upper arm at the midpoint of the sternum.<sup>1</sup>

The ACC/AHA's 2017 guidelines define stage 1 hypertension as 130-139/80-89 mm Hg and stage 2 hypertension as  $\geq 140/90$  mm Hg.<sup>4</sup> The ADA defines hypertension as a sustained blood pressure  $\geq 140/90$  mm Hg, noting that the definition is "based on unambiguous data that levels above this threshold are strongly associated with ASCVD, death, disability, and microvascular complications."<sup>1</sup>

## BLOOD PRESSURE TARGETS

Evidence has shown that treatment of blood pressure to a goal of  $\leq 140/90$  mm Hg reduces cardiovascular events as well as microvascular complications.<sup>1</sup> For patients with diabetes, the ADA recommends treatment to a systolic blood pressure goal of  $< 140$  mm Hg and a diastolic blood pressure goal of  $< 90$  mm Hg, while the ACC/AHA guidelines recommend a goal of  $< 130/80$  mm Hg.<sup>1,4</sup>

The ADA does note that lower blood pressure targets (eg,  $< 130/80$  mm Hg) can be appropriate for individuals at high risk for cardiovascular disease if no treatment burdens (eg, adverse effects, costs) are imposed.<sup>1</sup> This is important, since patients with

diabetes often have multiple risk factors for ASCVD and will be considered high risk. Studies suggest lower blood pressure targets may decrease the risk for stroke and albuminuria but offer little to no effect on other ASCVD events, occurrence of heart failure, or other conditions associated with diabetes (eg, peripheral neuropathy).<sup>1</sup>



## LIFESTYLE MANAGEMENT

Patients with diabetes and elevated blood pressure (> 120/80 mm Hg, per the 2017 ACC/AHA guidelines) are at high risk for hypertension and its complications.<sup>1,4</sup> Lifestyle management—which includes weight loss, a healthy diet, increase in physical activity, and moderation in alcohol intake—is an important component of preventing or delaying a hypertension diagnosis.<sup>1,4</sup>

Both the ADA and the ACC/AHA recommend that patients with diabetes follow the Dietary Approaches to Stop Hypertension (DASH) diet.<sup>1,4</sup> Guidelines include restricting sodium intake to < 2,300 mg/d, consuming 8-10 servings/d of fruits and vegetables and 2-3 servings/d of low-fat dairy products, limiting alcohol consumption to two servings/d for men and one serving/d for women, and increasing physical activity to include at least 30-45 min/d of aerobic exercise.<sup>1,4</sup>

## PHARMACOLOGIC TREATMENT

Initial treatment for patients with hypertension and diabetes depends on the severity of the hypertension and should include drug classes that have demonstrated success in reducing ASCVD events: ACE inhibitors, angiotensin receptor blockers (ARBs), thiazide-like diuretics, and dihydropyridine calcium channel blockers. The ADA offers additional guidance:

**Blood pressure  $\geq$  140/90 mm Hg** should be treated with lifestyle modifications and simultaneous initiation of a single drug, with timely titration of pharmacologic therapy to achieve blood pressure goals.

**Blood pressure  $\geq$  160/100 mm Hg** should be treated with lifestyle therapy and prompt initiation and timely titration of two drugs or a single-pill combination of drugs.

**Multidrug therapy is generally required** to achieve blood pressure targets—but ACE inhibitors and ARBs should not be used in combination due to the increased risk for adverse effects.

**Firstline therapy** is an ACE inhibitor or an ARB, at the maximum tolerated dose, in patients with diabetes and a urine albumin-to-creatinine ratio  $\geq$  30 mg/g.

**Monitoring** of estimated glomerular filtration rate and serum potassium levels is needed in patients treated with an ACE inhibitor, ARB, or diuretic.<sup>1</sup>

## RESISTANT HYPERTENSION

Patients with diabetes who have a blood pressure  $\geq$  140/90 mm Hg despite treatment that includes lifestyle management, two antihypertensives, and a diuretic, or who achieve blood pressure control with four or more medications, are considered to have resistant hypertension.<sup>1,5</sup> Factors such as pseudo-resistance (lack of medication adherence or poor measurement technique), masked hypertension, and white coat hypertension should be ruled out in making the diagnosis of resistant hypertension. Once these have been excluded, patients should be referred for a workup of their resistant hypertension to evaluate causes of secondary hypertension. These can include endocrine issues, renal arterial disease, edema in advanced kidney disease, hormones, and drugs such as NSAIDs and decongestants.<sup>1</sup>

## PATIENT-CENTERED CARE

When evaluating and treating a patient with diabetes, it is important to consider

- What is the patient's overall risk for atherosclerotic cardiovascular disease?
- Does he/she have an increased risk for stroke? If so, lower blood pressure tar-

gets may be appropriate.

- Is more than one antihypertensive agent (ACE inhibitor, ARB, or diuretic) being used? If so, close monitoring of estimated glomerular filtration rate and potassium (as well as other indications of adverse effects) is important.

The treatment regimen should be a shared decision-making process between the clinician and patient and should be individualized to each patient and his/her existing comorbidities.

### CONCLUSION

Clinical trials and meta-analyses support target blood pressure management to < 140/90 mm Hg in most adults with diabetes, while lower targets (< 130/80 mm Hg) may be beneficial for patients with diabetes and a high risk for cardiovascular disease.<sup>1,5</sup> Lifestyle management should be initiated and continued in patients with a blood pressure > 120/80 mm Hg and in those diagnosed with hypertension.<sup>1</sup> Medications that reduce cardiovascular events should be

used in management, with ACE inhibitors or ARBs being firstline treatment in patients with albuminuria.<sup>1</sup>

For more information on hypertensive treatment in special populations (eg, pregnant women and older adults), see the ADA's full position statement.<sup>1</sup> **CR**

### REFERENCES

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