

TABLE 1**Key studies of angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) in the treatment of patients with hypertension or related cardiovascular conditions**

Study	Objective	Patients	Treatment	Primary End Point	Main Results
HOPE ²¹	To assess the role of an ACE inhibitor in preventing risk for CV events in high-risk patients.	9297 high-risk patients who had evidence of vascular disease or diabetes plus 1 other CV risk factor and who were not known to have low ejection fraction or HF.	Ramipril or matching placebo.	Composite of MI, stroke, or death from CV causes.	Ramipril significantly decreased risk for the primary end point ($P<.001$) as well as death from CV causes ($P<.001$), MI ($P<.001$), stroke ($P<.001$), death from any cause, ($P=.005$), revascularization procedures ($P=.002$), cardiac arrest ($P=.02$), HF ($P<.001$), and complications related to diabetes ($P=.03$).
LIFE ²²	To establish whether selective blocking of ANG II with an ARB improves LVH beyond reducing BP and, consequently, reduces CV morbidity and death.	9193 patients with essential hypertension and LVH.	Losartan-based or atenolol-based antihypertensive treatment.	CV event (death, MI, or stroke).	Losartan significantly decreased the risk for the primary end point ($P=.021$), fatal or nonfatal stroke ($P=.001$), and new-onset diabetes ($P=.001$) vs atenolol.
CHARM ²³	To determine whether use of an ARB could reduce mortality and morbidity in patients with CHF.	7601 patients in 3 populations: patients with LVEF $\leq 40\%$ who were or were not receiving an ACE inhibitor, and patients with LVEF $>40\%$.	Candesartan or placebo in addition to other appropriate therapy.	All-cause mortality.	There was no between-group difference for overall mortality, but candesartan treatment did significantly decrease CV deaths ($P=.006$) and hospital admissions for HF ($P<.0001$).
MOSES ²⁴	To determine whether eprosartan would be more effective than nitrendipine for decreasing cerebrovascular and CV morbidity and mortality in hypertensive stroke patients.	1405 high-risk hypertensive patients with a cerebrovascular event during the last 24 months.	Eprosartan- or nitrendipine-based antihypertensive therapy.	Composite of total mortality and all CV and cerebrovascular events, including all recurrent events.	Eprosartan-based treatment was significantly superior to nitrendipine in decreasing risk for the primary end point ($P=.014$).
ONTARGET ²⁵	To compare the clinical effects of an ARB (telmisartan), an ACE inhibitor (ramipril), or both in patients with vascular disease or high-risk diabetes.	25,620 patients with vascular disease or high-risk diabetes.	Telmisartan, ramipril, or the combination.	Composite of death from CV causes, MI, stroke, or hospitalization for HF.	There was similarity of outcomes among groups for the primary outcome measure. Combination therapy did result in a higher risk for hypotensive symptoms ($P<.001$), syncope ($P=.03$), and renal dysfunction ($P<.001$) vs ramipril alone.
SCOPE ²⁷	To test the hypothesis that the ARB candesartan can reduce the risk of stroke in elderly patients with ISH.	4964 elderly patients (1518 with ISH).	Candesartan or placebo added to other agents added as needed to control BP.	Composite of CV death, nonfatal stroke, and nonfatal MI.	Candesartan was significantly superior to placebo in decreasing the risk for fatal and nonfatal stroke ($P=.049$).

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TRANSCEND ³⁰	To determine whether telmisartan would be effective in patients with CVD or diabetes with end-organ damage who were intolerant of ACE inhibitors.	5926 patients with CVD or diabetes with end-organ damage who were intolerant of ACE inhibitors.	Telmisartan or placebo.	Composite of CV death, MI, stroke, or hospitalization for HF.	There was no significant difference between telmisartan and placebo for the primary outcome. Telmisartan was significantly superior to placebo in decreasing the unadjusted ($P=.048$), but not the adjusted ($P=.068$), risk for a composite of CV death, MI, or stroke. Telmisartan also significantly decreased the risk for CV hospitalization ($P=.025$).
ACCOMPLISH ²⁶	To determine whether the combination of an ACE inhibitor and a dihydropyridine calcium-channel blocker would be more effective in reducing the rate of CV events than treatment with an ACE inhibitor plus a thiazide diuretic.	11,506 patients with hypertension who were at high risk for CV events.	Benazepril plus amlodipine or hydrochlorothiazide.	Composite of death from CV causes, nonfatal MI, nonfatal stroke, hospitalization for angina, resuscitation after sudden cardiac arrest, and coronary revascularization.	The benazepril-amlodipine combination was significantly superior to the benazepril-hydrochlorothiazide combination in decreasing risk for the primary end point ($P<.001$) and in reducing the risk for the composite of death from CV causes, nonfatal MI, and nonfatal stroke ($P=.002$).
ALLHAT ²⁸	To determine whether treatment with a calcium-channel blocker or an ACE inhibitor lowers the incidence of CHD or other CVD events versus treatment with a diuretic.	33,357 patients with hypertension and at least 1 other risk factor for CHD.	Chlorthalidone-, amlodipine-, or lisinopril-based antihypertensive therapy.	Composite of fatal CHD or nonfatal MI.	There was no significant difference among treatments for the primary end point. Lisinopril had higher 6-year rates of combined CVD, stroke, and HF than did chlorthalidone. Amlodipine had a significantly greater incidence of HF than did either chlorthalidone or lisinopril.
VALUE ²⁹	To test the hypothesis that for the same BP control, valsartan would reduce cardiac morbidity and mortality more than amlodipine would in hypertensive patients at high CV risk.	15,245 patients with treated or untreated hypertension and high risk of cardiac events.	Therapy based on valsartan or amlodipine.	Composite of cardiac mortality and morbidity.	There was no significant difference between treatments for the primary composite end point.

ACE, angiotensin-converting enzyme; ANG II, angiotensin II; ARB, angiotensin receptor blocker; BP, blood pressure; CCB, calcium channel blocker; CHD, coronary heart disease; CHF, chronic heart failure; CV, cardiovascular; CVD, cardiovascular disease; HF, heart failure; ISH, isolated systolic hypertension; LVEF, left ventricular ejection fraction; LVH, left ventricular hypertrophy; MI, myocardial infarction.

HOPE, Heart Outcomes Prevention Evaluation; LIFE, Losartan Intervention for Endpoint Reduction in Hypertension; CHARM, Candesartan in Heart Failure Assessment of Reduction in Mortality and Morbidity; MOSES, Morbidity and Mortality After Stroke, Eprosartan Compared With Nitrendipine for Secondary Prevention; ONTARGET, Ongoing Telmisartan Alone and in Combination with Ramipril Global Endpoint Trial; TRANSCEND, Telmisartan Randomized Assessment Study in ACE Intolerant Subjects with Cardiovascular Disease; ACCOMPLISH, Avoiding Cardiovascular Events through Combination Therapy in Patients Living with Systolic Hypertension; SCOPE, Study on Cognition and Prognosis in the Elderly; ALLHAT, Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial; VALUE, Valsartan Antihypertensive Long-term Use Evaluation.