

■ Items 6–8

A 55-year-old Caucasian man comes to see you for treatment of his blood pressure. He suffered an inferior wall myocardial infarction two years previously that was treated with a percutaneous intervention. His cardiac function remains normal. He has a history of type 2 diabetes for many years controlled with metformin and glimepiride. Physical exam findings and pertinent laboratory examinations are as follows:

Height	5'11"
Weight	220 lbs.
Blood Pressure	155/96 mm Hg
A1C	6.5%
Albumin/Creatinine	40 mg/g
BUN/Cr	30/1.4 mg/dL
Potassium	4.5 mEq/L

6. In considering treatment for his blood pressure (BP), which *one* of the following combinations of classes of hypertensive medications would be MOST appropriate?
- (A) Diuretics and beta-blockers.
 - (B) Diuretics and angiotensin converting enzyme (ACE) inhibitors.
 - (C) Beta-blockers and calcium channel blockers (CCBs).
 - (D) Beta-blockers and ACE inhibitors.
 - (E) CCBs and ACE inhibitors.
7. Based on the JNC 7 guidelines, which *one* of the following statements BEST fits a treatment strategy for this patient?
- (A) Thiazide-type diuretics should be used as initial drug treatment.
 - (B) If BP is more than 20/10 mm Hg above goal, consideration should be given to initiating therapy with 2 agents.
 - (C) A lifestyle modification program should be initiated and drug therapy only started if the patient is not at BP goal after 6 months.
 - (D) ACE inhibitors and angiotensin receptor blockers (ARBs) can cause hyperkalemia and should be avoided.
8. The patient was diagnosed with microalbuminuria based on the albumin to creatinine ratio of 40 mg/g. Which *one* of the following statements is INCORRECT regarding microalbuminuria?
- (A) It occurs in approximately 29% of patients with type 2 diabetes and 16% of patients with hypertension.
 - (B) It has been shown to be an independent risk factor for cardiovascular disease (CVD) outcomes in multiple studies of both type 1 and type 2 diabetics.
 - (C) There is a positive relationship between increasing urinary albumin concentration and mortality after adjustment for other CVD risk factors.
 - (D) It has been shown to correlate with cardiovascular risk and mortality in patients with type 2 diabetes but not in patients with hypertension but without type 2 diabetes.

64. A 73-year-old Hispanic man presents with uncontrolled hypertension of 180/70 mm Hg but with no associated symptoms. He has been hypertensive for 30 years and was initially started with atenolol 50 mg/tab q.d., with HCTZ 25 mg/tab q.d. added later to control his BP. His early morning BP readings range from 160–190/70–90 mm Hg. His doctor added an unrecalled medication which lowered his BP to 155/45 mm Hg, and he started to experience decrease in energy, dizziness, lightheadedness and weakness.

Physical Examination		Laboratory Studies	
Blood Pressure	143/49 mm Hg	Creatinine	1.0 mg/dL
Heart Rate	63 bpm	Potassium	4.2 mEq/L
Essentially normal PE findings		Sodium	142 mEq/L

Which *one* of the following is the appropriate goal of treatment for this patient?

- (A) Intensify his BP goals to <140 mm Hg systolic as stated in the JNC 7 guidelines.
 - (B) Maintain his pulse pressure to a range where he is asymptomatic.
 - (C) Add an ACE inhibitor to the regimen.
 - (D) Increase his atenolol to 100 mg/tab.
 - (E) Maintain his diastolic pressure <50 mm Hg.
65. A 23-year-old Caucasian woman was referred to the clinic for uncontrolled hypertension. She had been experiencing headaches and dizziness with associated high blood pressure, which became pronounced over the past 3 years. Her primary care physician started her on an unrecalled medication which did not control her BP. On physical examination there was a discrepancy in her upper extremity BP—150/90 mm Hg compared to her lower extremity BP—134/82 mm Hg. You can hear a grade 3/6 systolic murmur in the posterior left interscapular area with diminished femoral pulses. The rest of the examination was normal. Laboratory studies showed Sodium—142 mEq/L, Potassium—4.2 mEq/L, Creatinine—1.1 mg/dL.
- Which *one* of the following is the treatment of choice for this patient?
- (A) Start her on a diuretic to control BP <140/90 mm Hg.
 - (B) Start phenoxybenzamine.
 - (C) Start spironolactone.
 - (D) Start propylthiouracil (PTU).
 - (E) Order balloon angioplasty.
66. A 43-year-old African American woman presented with elevated office blood pressure readings of 140–145/80–90 mm Hg, with associated symptoms of palpitations, sweating, weight loss and heat intolerance for the past 3 months. She was initially seen by her primary care physician who started her on atenolol 50 mg/tab q.d., which controlled her palpitations. She was referred to the clinic for hypertension. On physical examination her BP is 142/80 mm Hg, heart rate 102 bpm, weight—130 lbs., and minimal proptosis. She had moist skin and mucosa, and feels hot despite being inside an air-conditioned room. She is tachycardic, but the rest of the exam is normal.

Which *one* of the following is the MOST appropriate treatment for this patient?

- (A) Increase the dose of atenolol to 100 mg/day.
- (B) Add a thiazide diuretic to reach BP goal to <130/80 mm Hg.
- (C) Start phenoxybenzamine for possible pheochromocytoma.
- (D) Start PTU.
- (E) Add spironolactone 50 mg/tab.

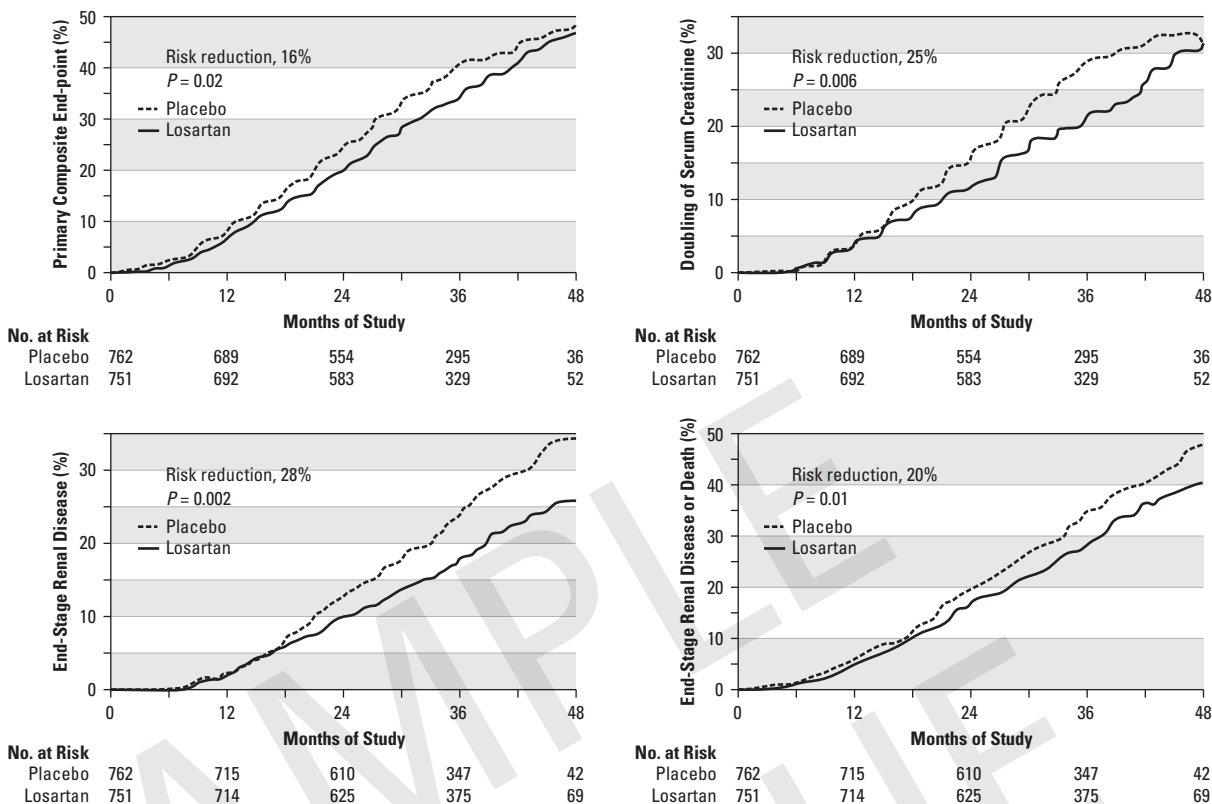


Figure 1. Kaplan-Meier Curves of the Percentage of Patients with the Primary Composite End Point (Panel A) and Its Individual Components, a Doubling of the Serum Creatinine Concentration (Panel B), End-Stage Renal Disease (Panel C), and the Combined End Point of End-Stage Renal Disease or Death (Panel D). The mean follow-up time was 3.4 years (42 months).

Bibliography

1. Brenner BM, et al: Effects of losartan on renal and cardiovascular outcomes in patients with type 2 diabetes and nephropathy. *NEJM* 2001;345(12):861–869.

Item 11 Answer B

A recent meta-analysis evaluated 49 studies involving over 6100 participants to determine the effect of treatment with ACE inhibitors, ARBs and other agents on proteinuria. The study concluded that ARBs and ACE inhibitors reduced proteinuria to a similar degree and that the reduction of proteinuria was greater when compared with placebo or calcium channel blockers. The combination of ACE inhibitors and ARBs further reduced proteinuria more than either agent alone. The reduction in proteinuria was independent of the degree of proteinuria and of underlying disease.

Bibliography

1. Kunz R, et al: Meta-analysis: effect of monotherapy and combination therapy with inhibitors of the renin angiotensin system on proteinuria in renal disease. *Ann Intern Med* 2008;148(1):30–48.

■ **Items 12–15**

Item 12 Answer A

Angiotensin-converting enzyme inhibitors, angiotensin-receptor blockers, and direct renin inhibitors contain the following black box warning from the FDA: When used in pregnancy drugs that act directly on the renin-angiotensin system can cause injury and even death to the developing fetus. These drugs should be stopped as soon as pregnancy is detected and should probably be avoided in women of child-bearing age if a future pregnancy is contemplated or if they are not on adequate birth control.