

## Do the Effects of Blood Pressure Drugs Differ by Kidney Function?

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The full report is titled “Cardiovascular Outcomes in High-Risk Hypertensive Patients Stratified by Baseline Glomerular Filtration Rate.” It is in the 7 February 2006 issue of *Annals of Internal Medicine* (volume 144, pages 172-180). The authors are M. Rahman, S. Pressel, B.R. Davis, C. Nwachuku, J.T. Wright Jr., P.K. Whelton, J. Barzilay, V. Batuman, J.H. Eckfeldt, M.A. Farber, S. Franklin, M. Henriquez, N. Kopyt, G.T. Louis, M. Saklayen, C. Stanford, C. Walworth, H. Ward, and T. Wiegmann, for the ALLHAT Collaborative Research Group.

### What is the problem and what is known about it so far?

People with high blood pressure (BP) are more likely to develop heart, blood vessel, and kidney disease. Drugs that lower BP may prevent these complications. Drugs known as angiotensin-converting enzyme (ACE) inhibitors are thought to be best for preventing kidney failure in people with high BP and lower kidney function. Diuretics, also called water pills, are thought to be best for preventing cardiovascular disease (CVD) in people with high BP regardless of level of kidney function. How these and other BP drugs compare in their ability to prevent CVD and kidney failure has never been directly studied.

### Why did the researchers do this particular study?

To compare the ability of different BP drugs to prevent CVD and kidney failure in people with high BP and different levels of kidney function.

### Who was studied?

31,897 people with high BP and at least 1 other risk factor for CVD. All were 55 years of age or older.

### How was the study done?

Participants were assigned at random to receive an ACE inhibitor, a water pill, or another type of BP-lowering drug known as a calcium-channel blocker. The researchers used a blood test to classify people as having normal, mildly reduced, or more severely reduced kidney function. They then compared the rates of CVD and kidney failure on the basis of participants' kidney function and the BP-lowering drug they were taking.

### What did the researchers find?

Heart and blood vessel disease were more common than kidney failure in participants with reduced kidney function. The risk was highest for those with more severely reduced function. Overall, ACE inhibitors and water pills were about equally likely to protect against heart attacks. However, water pills seemed more effective at preventing some other kinds of CVD, stroke, and heart failure. Calcium-channel blockers and water pills were about equally likely to protect against all CVD. Water pills seemed more effective at preventing stroke. These results generally held for all participants regardless of kidney function.

### What are the limitations of the study?

The researchers studied older people with at least 2 risk factors for CVD. The findings may not apply to younger people at lower risk. Participants were allowed to take BP-lowering drugs other than those the researchers directly studied. Also, they were not allowed to take more than 1 of the study drugs. Therefore, the findings may not apply to people taking a single BP-lowering drug or different combinations of drugs.

### What are the implications of the study?

Cardiovascular disease is more common than kidney failure in older people with high BP and lower kidney function. The risk for CVD is highest in those with the lowest kidney function. Water pills were as effective as other drugs for preventing complications of CVD regardless of kidney function.

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