

# Keeping the heart's electrical system running

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A drug commonly used to treat high blood pressure has been shown to significantly reduce the risk of blocked electrical impulses to the heart and could be an effective treatment for certain types of heart disease known as conduction disease, in which the progression of electrical impulses through the heart is impeded, according to researchers at UCSF and Oregon Health & Science University (OHSU).

Their study, which compared the effectiveness of the drug lisinopril against two other blood pressure medications, as well as a cholesterol drug and a control, appeared online June 27, 2016, in *JAMA Internal Medicine*.

"Despite our success in preventing coronary heart disease, we have yet to rigorously identify potential strategies to prevent conduction disease of the heart, a common cause of pacemaker implantation and likely an important contributor to heart failure," said senior author Gregory Marcus, MD, MAS, a UCSF Health cardiologist and director of clinical research in the UCSF Division of Cardiology. "Because these patients were randomly assigned to lisinopril therapy, these findings favor a causal relationship between the drug and a reduced risk of conduction disease."

In the *JAMA Internal Medicine* study, Marcus and his colleagues utilized electrocardiograms at enrollment and every two years of follow up for eight years from the National Institutes of Health-funded ALLHAT (Antihypertensive and Lipid-Lowering treatment to prevent Heart Attack Trial).

Of 42,418 overall ALLHAT study participants age 55 or older with hypertension and at least one other cardiac risk factor, 21,004 individuals were enrolled and randomly assigned to receive one of three drugs commonly prescribed to treat high [blood pressure](#) and other symptoms: amlodipine, lisinopril or chlorthalidone. In addition, 10,355 study participants with elevated cholesterol levels were randomized to either the high cholesterol drug pravastatin or standard care.

The researchers hypothesized that the drug lisinopril, an angiotensin converting enzyme (ACE) inhibitor purported to have anti-fibrotic activities, would be associated with a lower risk of conduction disease. Indeed, compared to chlorthalidone, those on lisinopril had a 19 percent reduction in conduction abnormalities.

The study found that amlodipine was not associated with a significant reduction in conduction disease, and that pravastatin was no better than standard care.

Over an average five-year period, 1,114 of the 21,004 participants (5.3 percent) still developed conduction disease, including 389 with a delay or blockage of [electrical impulses](#) to the left side of the heart, 570 to the right side of the [heart](#) and 155 in the ventricles themselves.

The authors said further studies are needed to determine whether the pharmacologic treatments have an impact on patient outcomes due to conduction abnormalities, including the need for pacemaker implants.

"Our analysis also allowed us to identify certain patient characteristics, including increased age, male gender, white race and diabetes, that were associated with heightened risk of conduction system disease," said lead author Thomas Dewland, MD, OHSU assistant professor and former UCSF resident and cardiology electrophysiology fellow. "These results may help guide future studies aimed at preventing conduction

abnormalities in high-risk patients."

**More information:** Effect of the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) on Conduction System Disease. [DOI: 10.1001/jamainternmed.2016.2502](https://doi.org/10.1001/jamainternmed.2016.2502)

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