



## When lower blood pressure isn't better

Over- and under-treatment linked to kidney failure and death

Isn't low blood pressure always healthier than high blood pressure? Not necessarily, according to the results of a Kaiser Permanente Southern California study. In fact, patients with blood pressure levels above or below an optimal range are at increased risk of kidney failure or death. The study was published in the *Journal of the American College of Cardiology* in August 2014.

"The conventional thinking has been that it's good to bring a hypertensive patient's blood pressure down as low as possible for the best outcomes," said lead study author John Sim, MD, from our Los Angeles Medical Center. This, however, is basing treatment goals on a population of people without high blood pressure, for whom 115 or 120 systolic would be considered very healthy. "Our study suggests that the 'lower the better' approach is not ideal," Dr. Sim said.

"There may be a subpopulation for whom clinicians may be adding risk with aggressive treatment."

Researchers examined the electronic health records of nearly 400,000 Kaiser Permanente patients in Southern California who were medically treated for hypertension from January 2006 through December 2010.

The study found that patients with blood pressures within the range between 130 and 139 systolic and between 60 and 79 diastolic were at the lowest risk for kidney failure and death. Blood pressure rates higher and lower than this range were associated with an increased risk of death and of developing end-stage renal disease, whether or not the patients had chronic kidney disease.

# Impact»»

Kaiser Permanente Southern California researchers found that, among people being treated for high blood pressure, those who had blood pressure in the range 130/60 to 139/70 experienced the lowest risk for mortality and end-stage renal disease.

Patients with blood pressure above or below these ranges were at greater risk for these outcomes.

Based in part on this study, Kaiser Permanente has launched a low blood pressure alert in the electronic medical records of all patients ages 70 years and older who are on blood pressure medication. In addition, the blood pressure thresholds have been raised for patients ages 60 years and older with diabetes and chronic kidney disease.

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—Joel Handler, MD

When compared with patients who had a systolic blood pressure of between 130 and 139, patients in the range between 120 and 129 (widely accepted as normal) were 10% more likely to die or develop kidney failure. Patients with a systolic blood pressure between 140 and 149 were 40% more likely to develop kidney failure or to die.

“While we have previously recommended a more aggressive blood pressure lowering for these patients, we have now pulled back,” said Dr. Sim.

Although current U.S. treatment guidelines recommend that adults between ages 30 and 59 years with hypertension should aim for a target blood pressure below 140/90, the guidelines do not cite the dangers of lowering a patient’s blood pressure below a certain level. The KPSC study clearly alerts clinicians to the dangers.

Before this study was published, KPSC started to address low blood pressure in patients ages 70 years and older who are on blood pressure medication. When the patients have a blood pressure of 110 systolic or lower, an alert is triggered in our electronic health record, Kaiser Permanente HealthConnect® with the recommendation to consider reducing or discontinuing the medications to achieve more appropriate blood pressure rates.

“As a result of this study, there’s considerably more conversation about the adverse effects of overtreatment. People are talking about it, thinking about it, and I’m hopeful that it will have an impact in the hypertension world outside Kaiser Permanente,” said Joel Handler, MD, of our Anaheim Medical Center, regional hypertension champion. “We are showing that there’s a flip side of very high control rates.”

“We hope to change the thinking that ‘lower is better,’ and pave the way for a more effective strategy in treating patients with high blood pressure,” said Dr. Sim.

An update: In 2015, KPSC was recognized by the U.S. Department of Health and Human Services as Hypertension Control Champions by Million Hearts™, a national initiative to prevent 1 million heart attacks and strokes by 2017.