

# Study questions recent relaxation of recommended blood pressure targets for diabetics

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Strict blood pressure control is associated with a reduced chance of long-term kidney damage in patients with type 1 diabetes, according to a new long-term study led by UC San Francisco researchers.

Diabetes is a major risk factor for kidney disease: 30 percent of patients with type 1 diabetes and 10 to 40 percent of those with type 2 diabetes typically develop kidney disease at some point in their lives, according to the National Kidney Foundation. The new study, published November 21, 2016 in *Diabetes Care*, compared [blood pressure control](#) and kidney health in nearly 1,500 type 1 diabetes patients over more than two decades, and found that those who consistently maintained lower blood pressure levels were at significantly lower risk of developing chronic kidney disease.

While the researchers said further study would be needed to prove causation, the finding is an important first step in exploring the issue, said study senior author Chi-Yuan Hsu, MD, a professor of medicine and chief of the Nephrology Division at UCSF Medical Center: "Chronic kidney disease is one of the leading causes of increased mortality seen in patients with type 1 diabetes."

The new findings contrast sharply with the recent relaxation of aggressive blood pressure targets for [diabetes patients](#) recommended by the American Diabetes Association (ADA) and NIH Joint National

Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC). In 2014, these groups relaxed acceptable blood pressure targets for patients with diabetes, replacing the relatively conservative recommendation to maintain blood pressure below 130/80 mm Hg, with a more permissive target of keeping blood pressure below 140/90 mm Hg, citing a lack of evidence that more intensive blood pressure control improved health outcomes in diabetics.

Nephrologist Elaine Ku, MD, an assistant professor of medicine at UCSF and lead author on the new study, is wary of these recommendations, which she says ignore the crucial difference between type 1 and type 2 diabetes. Among other factors, Ku said, patients with type 1 diabetes, who are typically diagnosed in childhood or as young adults, may have a longer time to suffer potential kidney damage as a result of long-term [high blood pressure](#). However, most of the existing studies of high blood pressure and diabetes focused on the more common type 2 diabetes, she said, and these are the studies upon which the ADA and JNC primarily based their recent recommendations.

"We felt it was critical to better understand how blood pressure affects those with type 1 diabetes over the long term," Ku said.

Ku, who also directs the UCSF Nephrology Transition Clinic for adolescents and young adults with kidney disease, emphasizes that the current study can only show a correlation between higher blood pressure and increased risk of kidney disease in those with type 1 diabetes: "It will take a long-term randomized clinical trial to prove causation, but right now, this cohort is the best dataset I am aware of that allows us to even ask this question. The data suggest the current guidelines are not as strict as they should be for these patients."

In their study, Ku and colleagues drew on the [Diabetes Control and Complications Trial](#) (DCCT), a randomized study of how blood-sugar

control impacted health outcomes in 1,441 patients with type 1 [diabetes](#) who ranged in age from 13 to 39 when the trial began in 1983.

Researchers continue to observe long-term health outcomes in most of these patients, as part of the Epidemiology of Diabetes Interventions and Complications Study (EDICS).

The UCSF team looked at DCCT participants' annual blood pressure measurements over several decades (median follow-up time 24 years) and looked at which participants developed macroalbuminuria—an early warning sign for kidney dysfunction—or full-blown kidney disease by the end of the study.

They found that participants who had maintained their [systolic blood pressure](#) – the pressure in the arteries when the heart contracts – below 120 mm Hg had a 41 percent lower risk of macroalbuminuria and a 68 percent lower risk of stage III [chronic kidney disease](#), compared to participants whose systolic blood pressure was in the ADA-approved 130 to 140 mm Hg range.

Analysis of diastolic blood pressure – the pressure in the arteries in the pauses between heartbeats – revealed a similar relationship: Participants who maintained a diastolic blood pressure of less than 70 mm Hg had a 27 percent lower chance of macroalbuminuria and a 53 percent lower risk of chronic [kidney disease](#) than those whose [diastolic blood pressure](#) was in the 80 to 90 mm Hg range.

According to Ku, the new research should be a wake-up call to conduct more long-term studies of the effects of blood pressure on kidney health.

"There's been a lot of research focused on blood pressure, which makes us think we know what we're doing," Ku said. "But in my practice as a nephrologist who sees both children and adults with chronic illnesses, I realize we don't understand how [blood pressure](#) impacts people's health

in the long term nearly as well as we should."

**More information:** Elaine Ku et al. Association Between Blood Pressure and Adverse Renal Events in Type 1 Diabetes, *Diabetes Care* (2016). [DOI: 10.2337/dc16-0857](https://doi.org/10.2337/dc16-0857)

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