

# Review: Healthy kidney donors may have a long-term increase in blood pressure beyond that associated with normal aging

Boudville N, Prasad R, Knoll G, et al. Meta-analysis: risk for hypertension in living kidney donors. *Ann Intern Med.* 2006;145:185-96.

**Clinical impact ratings:** Cardiology ★★★★★☆☆ Nephrology ★★★★★★☆☆

## QUESTION

In healthy, normotensive persons, is kidney donation associated with increased risk for higher blood pressure (BP) or hypertension?

## METHODS

**Data sources:** MEDLINE, EMBASE/Excerpta Medica (1966 to November 2005), Science Citation Index, "Related Articles" on PubMed, primary study authors, and reference lists.

**Study selection and assessment:** Studies in any language that assessed BP  $\geq 1$  year after kidney donation in healthy, normotensive adults. 48 studies ( $n = 5145$  donors, mean age 41 y, 58% women) met the selection criteria, with a median 6 years (range 1 to 25 y) of follow-up. 23% of studies were prospective. Overall, 31% of donors were lost to follow-up. 10 studies ( $n = 1168$  donors) included an appropriate comparison group and were the focus of the meta-analysis.

**Outcomes:** Systolic and diastolic BP, and hypertension (variably defined).

## MAIN RESULTS

Systolic and diastolic BP were increased in kidney donors compared with control participants (Table). 6 studies compared risk for hypertension in 249 donors and 161 control participants. 1 study showed an increased risk in donors (relative risk 1.9, 95% CI 1.1 to 3.5), 3 studies showed a trend toward higher risk in donors, and 2 studies showed a trend toward lower risk in donors; results were not pooled because of statistical heterogeneity.

## CONCLUSIONS

Healthy, normotensive persons who donate a kidney may have an increase in blood pressure of about 5 mm Hg over the following 5 to 10 years beyond that associated with normal aging. Evidence of risk for hypertension during this period is conflicting.

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## Blood pressure (BP) in kidney donors compared with control participants at 6 to 13 years after donation\*

Outcomes	Number of studies (donors, control participants)	Mean (SD)		Weighted mean difference (95% CI)
		Donors	Controls	
Systolic BP (mm Hg)	4 (157, 128)	133 (6)	126 (8)	6 (2 to 11)
Diastolic BP (mm Hg)	5 (196, 161)	84 (5)	80 (3)	4 (1 to 7)

\*SD = standard deviation. CI defined in Glossary.

## COMMENTARY

Organ donation is the only surgery performed in routine clinical practice that is not for the patient's own physical well-being. The ethical justifications for living kidney donation are altruism and donor psychological benefit. Therefore, proper informed consent and a low risk-benefit ratio are critical. Because of the limited supply of cadaver kidneys in the United States, the number of living kidney donors has surpassed the number of deceased donors in recent years.

This well-conducted meta-analysis by Boudville and colleagues is the best summary to date to quantify a single adverse outcome after living kidney donation—increased BP. The results are biologically plausible and vividly illustrate the critical role that kidneys play in determining long-term BP (1). These data should inform the current controversies about accepting kidney donation from "altruistic strangers" or those who have such "isolated medical abnormalities" as hypertension or proteinuria (2).

The authors reported that a 5-mm Hg increase in diastolic BP has been associated with a 1.5-fold increase in death from ischemic heart

disease and stroke. Recent data showed that this degree of BP elevation is also associated with a similar magnitude increase in risk for end-stage renal disease (3). Kidney donors should have routine follow-up assessment of BP (as well as glomerular filtration rate and proteinuria). The threshold to initiate medications that block the renin-angiotensin system should be set low.

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## References

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