Long term risks in kidney donors

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Hypertension
Proteinuria
ESRD
Mortality

Blood pressure

Annals of Internal Medicine | REVIEW

Meta-Analysis: Risk for Hypertension in Living Kidney Donors

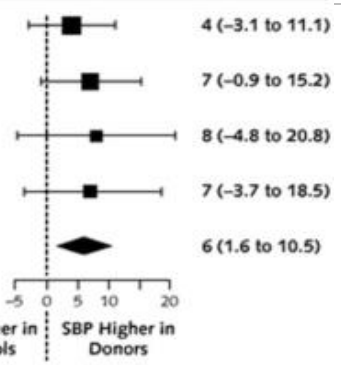
Neil Boudville, MD; G.V. Ramesh Prasad, MD; Greg Knoll, MD, MSc; Norman Muirhead, MD; Heather Thiessen-Philbrook, MMath; Robert C. Yang, MD; M. Patricia Rosas-Arellano, MD, PhD; Abdulrahman Housawi, MD; and Amit X. Garg, MD, PhD, for the Donor Nephrectomy Outcomes Research (DONOR) Network*

Annals of Internal Medicine
Established in 1927 by the American College of Physicians

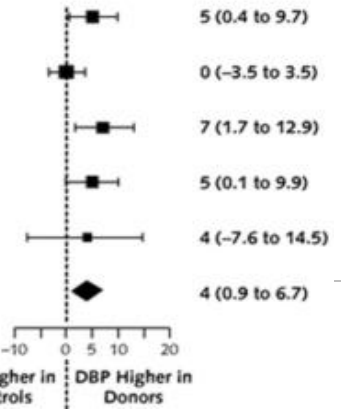
From: Meta-Analys

Ann Intern Med. 2006;145(3):

Study, Year (Reference)	Donors, after Donation: Mean Years after Donation, (Range)*	Donors, *n*	Donors, after Donation: Mean Value SBP (SD), *mm Hg*†	Donors, after Donation: Use of Antihypertensive Medications, %	Control Participants: Controls, *n*	Control Participants: Mean Value SBP (SD), *mm Hg*†	Control Participants: Use of Antihypertensive Medications, %	Mean Difference in SBP (95% CI), *mm Hg*
Najarian et al., 1992 (50)	8 (1–19)	57	134 (15)	32	50	130 (21)	44	4 (–3.1 to 11.1)
Undurraga et al., 1998 (53)	11 (1–21)	30	125 (18)	NR	30	118 (13)	NR	7 (–0.9 to 15.2)
Talselth et al., 1986 (54)	11 (10–12)	32	140 (23)	10	32	132 (29)	NR	8 (–4.8 to 20.8)
Williams et al., 1986 (57)	13 (10–18)	38	136 (25)	‡	16	129 (16)	‡	7 (–3.7 to 18.5)
Pooled estimate		157	133 (6)		128	126 (8)		6 (1.6 to 10.5)



Study, Year (Reference)	Donors, after Donation: Mean Years after Donation, (Range)*	Donors, *n*	Donors, after Donation: Mean Value DBP (SD), *mm Hg*†	Donors, after Donation: Use of Antihypertensive Medications, %	Control Participants: Controls, *n*	Control Participants: Mean Value DBP (SD), *mm Hg*†	Control Participants: Use of Antihypertensive Medications, %	Mean Difference in DBP (95% CI), *mm Hg*
O'Donnell et al., 1986 (37)	6 (3–18)	33	83 (10)	3	33	78 (9)	NR	5 (0.4 to 9.7)
Najarian et al., 1992 (50)	8 (1–19)	63	80 (8)	32	50	80 (11)	44	0 (–3.5 to 3.5)
Undurraga et al., 1998 (53)	11 (1–21)	30	86 (13)	NR	30	79 (9)	NR	7 (1.7 to 12.9)
Talselth et al., 1986 (54)	11 (10–12)	32	90 (10)	10	32	85 (10)	NR	5 (0.1 to 9.9)
Williams et al., 1986 (57)	13 (10–18)	38	85 (25)	‡	16	82 (16)	‡	4 (–7.6 to 14.5)
Pooled estimate		196	84 (5)		161	80 (3)		4 (0.9 to 6.7)



- “On the basis of the limited studies conducted to date, kidney donors may have a 5-mm Hg increase in blood pressure within 5 to 10 years after donation over that anticipated with normal aging.“

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Proteinuria

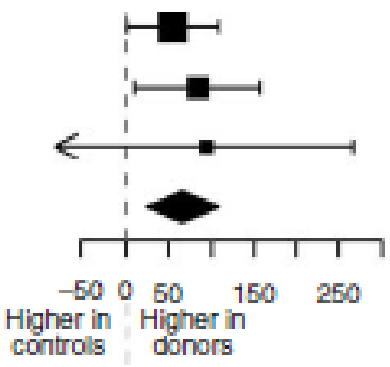
Proteinuria and reduced kidney function in living kidney donors: A systematic review, meta-analysis, and meta-regression

AX Garg[1,2,3], N Muirhead[1], G Knoll[4], RC Yang[1], GVR Prasad[5], H Thiessen-Philbrook[1], MP Rosas-Arellano[1], A Housawi[1] and N Boudville[1,6] for the Donor Nephrectomy Outcomes Research (DONOR) Network[7]

Increased

24 h urine protein

Source*	Donors, post-donation: Years after donation, Mean (range)	Donors, post-donation: 24 h urine Protein (mg/day) *N* mean (s.d.)	Controls: 24 h urine Protein (mg/day) *N* mean (s.d.)	24 h urine protein Mean difference (mg/day) 95% CI
D'Almeida *et al.*[45]	7 (1–14)	59 151 (125)	29 96 (116)	54 (1, 108)
Williams *et al.*[58]	13 (10–19)	37 115 (135)	17 31 (125)	84 (10, 157)
Mathillas *et al.*[60]	15 (10–20)	33 306 (320)	14 212 (255)	94 (–79, 267)
Pooled estimate		129 147 (22)	59 93 (30)	66 (24, 108)



Long-term risks for kidney donors

Geir Mjøen[1], Stein Hallan[2,3], Anders Hartmann[1], Aksel Foss[1], Karsten Midtvedt[1], Ole Øyen[1], Anna Reisæter[1], Per Pfeffer[1], Trond Jenssen[1], Torbjørn Leivestad[4], Pål- Dag Line[1], Magnus Øvrehus[2], Dag Olav Dale[1], Hege Pihlstrøm[1], Ingar Holme[5], Friedo W. Dekker[6] and Hallvard Holdaas[1]

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- 1901 kidney donors with 15 years median follow-up. Controls from HUNT1 survey.

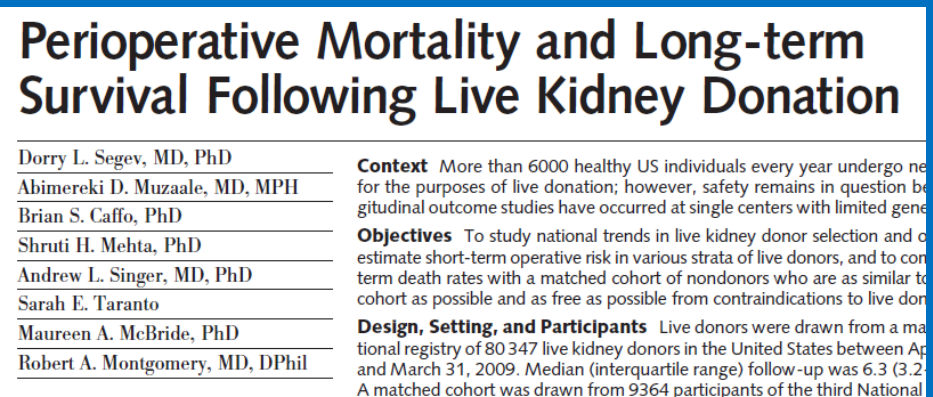
- Increased mortality (HR 1.3) and increased incidence of ESRD (HR 11.4) vs. controls.

Other studies on ESRD

- "Risk of End-Stage Renal Disease Following Live Kidney Donation" Muzaale et al, JAMA 2014
  - Around 8 – 10 times increased risk for ESRD
- Reese et al. et al. "Mortality, Cardiovascular and End-Stage Disease outcomes among Older Live Kidney Donors" JASN 2013; 24: 71A
  - Around 7 – 8 times increased risk for ESRD

Mortality differs from other studies

- Other studies did not find increased mortality.
- However, follow-up time was shorter



Perioperative Mortality and Long-term Survival Following Live Kidney Donation

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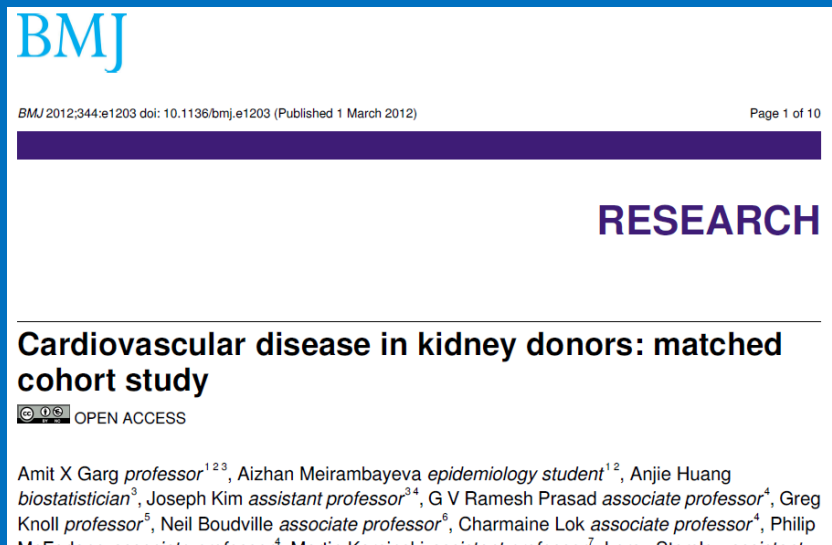
Abimereki D. Muzaale, MD, MPH
Brian S. Caffo, PhD
Shruti H. Mehta, PhD
Andrew L. Singer, MD, PhD
Sarah E. Taranto
Maureen A. McBride, PhD
Robert A. Montgomery, MD, DPhil

Context More than 6000 healthy US individuals every year undergo ne
for the purposes of live donation; however, safety remains in question be
gitudinal outcome studies have occurred at single centers with limited gene

Objectives To study national trends in live kidney donor selection and o
estimate short-term operative risk in various strata of live donors, and to con
term death rates with a matched cohort of nondonors who are as similar to
cohort as possible and as free as possible from contraindications to live don

Design, Setting, and Participants Live donors were drawn from a ma
tional registry of 80 347 live kidney donors in the United States between Ap
and March 31, 2009. Median (interquartile range) follow-up was 6.3 (3.2-
A matched cohort was drawn from 9364 participants of the third National



BMJ

BMJ 2012;344:e1203 doi: 10.1136/bmj.e1203 (Published 1 March 2012) Page 1 of 10

RESEARCH

Cardiovascular disease in kidney donors: matched cohort study

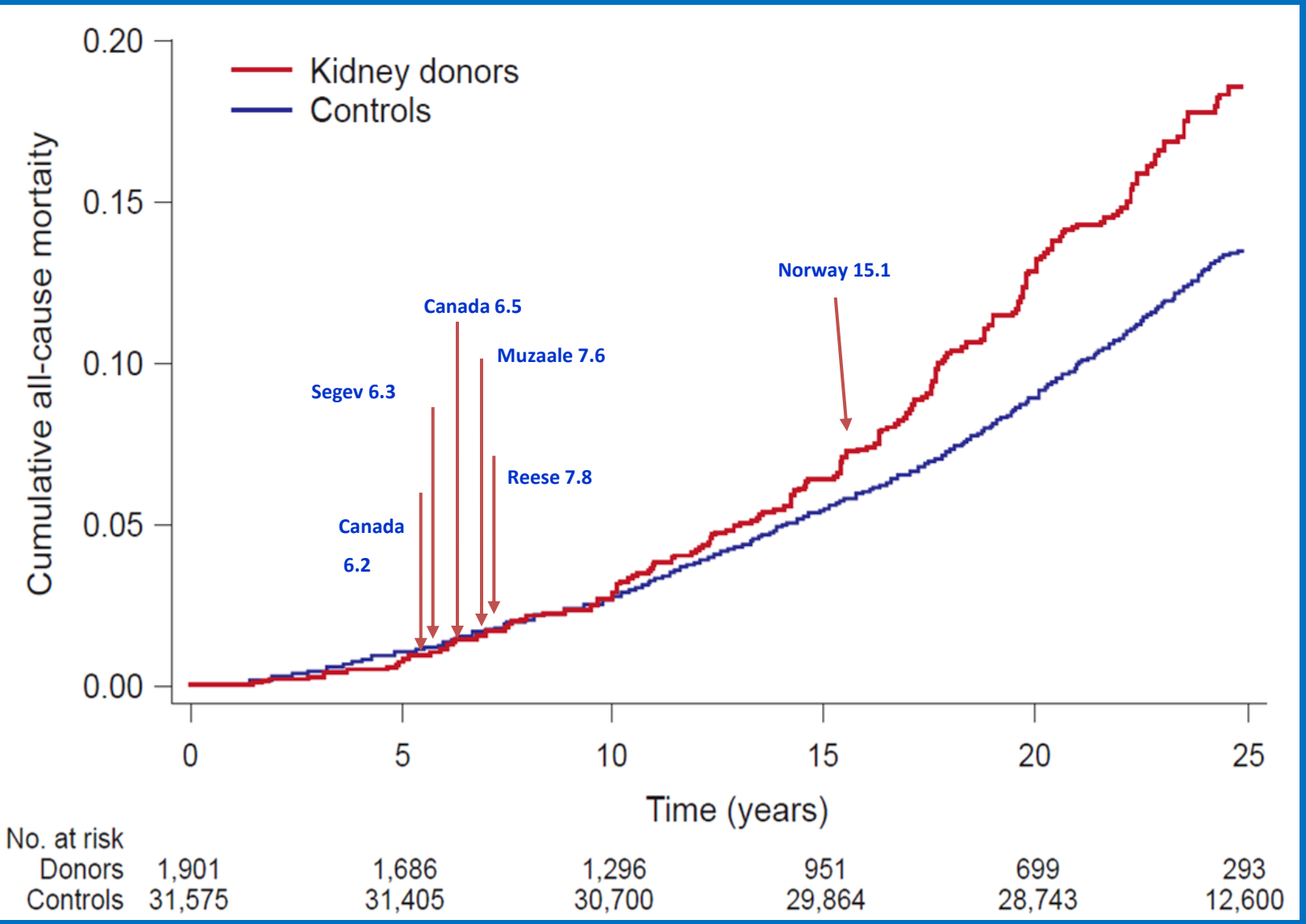
OPEN ACCESS

Amit X Garg *professor*[1 2 3], Aizhan Meirambayeva *epidemiology student*[1 2], Anjie Huang *biostatistician*[3], Joseph Kim *assistant professor*[3 4], G V Ramesh Prasad *associate professor*[4], Greg Knoll *professor*[5], Neil Boudville *associate professor*[6], Charmaine Lok *associate professor*[4], Philip

Follow-up time

- Long follow-up time is needed
- Harmful effects may take decades
- Kidney donors are very healthy and often relatively young at donation

Different follow-up time may explain different findings



Long-term risks

- Increased blood pressure
- Increased proteinuria
- Increased incidence of ESRD
- Increased mortality