Published in final edited form as:

Clin Transplant. 2012 ; 26(3): E300–E306. doi:10.1111/j.1399-0012.2012.01660.x.

Health care follow-up by live kidney donors more than 3 years post-nephrectomy

Francis L. Weng, MD, MSCE^{1,2}, Peter P. Reese, MD, MSCE³, Amy D. Waterman, PhD⁴, Angelo G. Soto, MD¹, Kitaw Demissie, MD, PhD², and Shamkant Mulgaonkar, MD¹

¹Renal and Pancreas Transplant Division and Department of Medicine, Division of Nephrology, Saint Barnabas Medical Center, Livingston, New Jersey

²Department of Epidemiology, School of Public Health, University of Medicine and Dentistry of New Jersey, Piscataway, New Jersey

³Center for Clinical Epidemiology and Biostatistics, and Department of Medicine, Renal-Electrolyte and Hypertension Division, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania

⁴Division of General Medical Sciences, Department of Medicine, Washington University School of Medicine, St. Louis, Missouri

Abstract

Background—Live kidney donors are advised to follow-up regularly with health care providers to monitor kidney function and to diagnose and treat relevant co-morbidities. We sought to determine the frequency and correlates of follow-up care among live kidney donors.

Methods—We sent a mailed questionnaire to 606 live kidney donors from a single center who were at least three years post-nephrectomy.

Results—We received usable responses from 276 (45.5%), at a median of 6.2 years post-donation. Compared to non-responders, responding donors were more likely to be older ($P<0.001$), female ($P=0.002$), White ($P<0.001$), and married to the recipient ($P<0.001$). In the prior year, 87.7% of respondents reported seeing a physician or other health care professional, and 79.0% had seen a “general doctor” such as their primary care provider. In univariable analyses of live kidney donors who responded to our survey, lack of medical follow-up in the past year was associated with younger age, current lack of health insurance, and infrequent contact with the transplant recipient.

Conclusions—Most responding live kidney donors had seen a health care provider within the past year. To improve donors’ follow-up, transplant centers can consider targeting donors who are younger or lack health insurance.

Keywords

live kidney donation; questionnaire; health services

Introduction

After donor nephrectomy, live kidney donors are encouraged to follow-up regularly with health care providers. This follow-up enables the diagnosis and treatment of (a) comorbidities that may harm the kidney (such as new-onset diabetes mellitus or hypertension), and (b) any deterioration in kidney function. The Organ Procurement and Transplantation Network (OPTN) currently mandates that U.S. transplant centers perform and report the results of such follow-up for at least two years after donation (1, 2).

Regular follow-up of live kidney donors is important, because of concerns regarding the long-term safety of donation (3). Live kidney donors have low risks of mortality and end-stage renal disease (4–6) but may incur slightly increased risks of hypertension (7) and proteinuria (8). The long-term safety of live kidney donation among some subgroups of donors (e.g. those who are Black, younger, or with isolated medical abnormalities) requires further study (9–13).

Although donor follow-up is important, rates of follow-up by live kidney donors are unknown. Transplant centers often report to the OPTN that their follow-up of live kidney donors is missing or incomplete, even within the first two years post-donation (14, 15). Most transplant centers describe difficulty in coordinating donors' follow-up care at the center (16). Instead, centers often recommend that donors follow-up with their primary care providers (PCPs), but donors' adherence to such follow-up is difficult to ascertain (16). A recent report recommended that transplant centers delegate follow-up after 3 months to a third-party organization (17).

Given the importance of regular medical follow-up by live donors and the lack of information regarding rates of such follow-up, we conducted a single center, cross-sectional survey of live kidney donors. We sought to determine the frequency and correlates of self-reported health care access and follow-up among donors more than three years post-nephrectomy. We hypothesized that many live kidney donors fail to follow-up regularly with health care providers.

Materials and Methods

Study design and eligibility

Using a mailed questionnaire, we performed a cross-sectional study of live kidney donors who had donated at Saint Barnabas Medical Center in Livingston, New Jersey, USA, between January 1, 2000, and December 31, 2006. During that time, 653 persons served as live kidney donors at Saint Barnabas. After excluding individuals who requested that the transplant center no longer contact them (N=2) and those whose mailing address was known to be incorrect based upon prior mailings, missing in our database, or outside the United States (N=45), there were 606 donors eligible for our study.

All donors had undergone an extensive, multidisciplinary evaluation to ensure their suitability for donation (18–20). Regarding medical criteria that often vary between transplant centers, persons were not accepted as live kidney donors if their evaluation revealed any of the following: confirmed creatinine clearance <80 mL/min/1.73m²; confirmed proteinuria >300 mg/day; age >75 years or <18 years; diabetes mellitus, impaired fasting glucose (glucose >100 mg/dL), or abnormal oral glucose tolerance test; or body mass index >35 . We excluded persons with high blood pressure, defined as use of any antihypertensive medications or blood pressure $>135/85$ during the physician evaluation (usually confirmed by 24-hour ambulatory blood pressure monitoring). Donor nephrectomies were performed laparoscopically, with less than 0.5% requiring open donor

nephrectomy. For persons who donated during 2000–2006, we did not formally recommend any specific frequency of post-donation medical follow-up.

Our study protocol was approved by the human subjects Institutional Review Board at Saint Barnabas Medical Center (Protocol 09-40).

Questionnaire content and development

We developed a self-administered questionnaire to examine health care access and use. We used and adapted items from publicly available, national surveys of health care utilization, including the Adult Access to Health Care & Utilization questionnaire from the 2006 National Health Interview Survey (21) and the Access to Care section of the Household Component of the 2005 Medical Expenditure Panel Survey (22).

We pretested the questionnaire (23). Transplant physicians, coordinators, social workers, and staff reviewed the items for content validity, item wording, and item order. The questionnaire was also pilot-tested in 10 former living kidney donors who donated after 2006 (and hence were ineligible for this study). These donors were interviewed to assess their comprehension of the meaning, wording, and order of individual questionnaire items, and the questionnaire was revised accordingly.

Survey implementation

We designed survey procedures to maximize response rates (23). In February 2010 (at least three years after donor nephrectomy), we mailed a one-page, introductory letter about the study to the 606 donors. One week later, we mailed the questionnaire, with a cover letter and self-addressed, stamped return envelope, to donors. As part of a separate study of response rates, we randomly assigned donors to receive either a \$2 or \$5 incentive that was included in the mailing (there were no significant differences in the response rates or responses of donors receiving the two different incentives). One week after mailing the questionnaire, we sent a postcard, thanking respondents and reminding non-respondents to return their questionnaires. Finally, approximately two weeks after the postcard, we sent a replacement questionnaire to non-respondents, with a tailored cover letter and a self-addressed, stamped return envelope.

Data management and statistical analysis

Survey data were entered into a relational database and verified using double data entry. We linked the donors' questionnaire results with their electronic medical records. Data from the time of donation regarding marital status, highest schooling completed, annual household income, and employment status were missing in most donors. Post-donation death was ascertained by querying both transplant center records and the Social Security Death Master File.

Analyses were performed using Stata 9.0 statistical software (Stata Corp, College Station, Texas, USA). Two-sided P-values <0.05 were considered statistically significant. Unless indicated otherwise, missing data accounted for <2% of the responses to any given item on the questionnaire.

Categorical variables were expressed as proportions, and their values across groups (e.g. race) were compared using chi-square testing. Continuous variables that were not normally distributed were expressed as medians (with 25%-75% interquartile ranges) and compared using Wilcoxon rank-sum tests. We used logistic regression to model associations between our outcome (medical follow-up within the past year) and possible predictors (24).

Results

Study sample and demographics

We mailed questionnaires to 606 living kidney donors. We received no response from 167 (27.6%), notification that the donor no longer resided at the address on file from 152 (25.1%), and notification that the donor had died in 4 cases (0.7%). According to the Social Security Death Master File, at the time of the mailing, no donors other than those 4 cases were deceased. We received responses from 283 donors (46.7%), of whom 276 donors (45.5%) returned questionnaires with at least 80% of questionnaire items completed. Our analysis focuses upon these 276 responding donors.

The demographic characteristics of the responding and non-responding live kidney donors differed significantly (Table 1). Respondents tended to be older, female, and White, and more likely to have donated to their spouse. The median number of years since donation was similar among respondents and non-respondents (6.2 versus 6.5 years, $P=0.13$).

Most responding live donors were graduates of high school or beyond, with only 5.8% lacking a high school diploma (Table 2). Over one-third earned at least \$100,000 annually.

Most of the responding donors had had recent contact with their recipients. For 243 donors (88.0%), the recipient of their live donor kidney was alive. Of those 243 donors, 198 (81.5%) had last spoken to the donor in the past one week. Only 19 donors (7.8% of 243) reported that over one month had elapsed since they last spoke to the recipient.

General donation and health questions

Almost all responding donors had favorable views of donation. If they had to make a decision to donate one of their kidneys again, the overwhelming majority of respondents would either “definitely” (86.6%) or “probably” (10.5%) donate a kidney again. Most would “definitely” (69.6%) or “probably” (24.3%) recommend that a friend serve as a living kidney donor.

Most responding donors were in either “very good” (40.6%) or “excellent” (36.6%) health at the time of the survey. Most believed that they should see their primary doctor at least once per year (65.2%) or at least once every 6 months (22.5%).

Health care access

Almost all the responding live kidney donors (87.7%) had health insurance at the time of the survey. Of the 242 respondents with health insurance, 83.9% had group, private, or commercial health insurance. The remainder had Medicare (9.5%), Medicaid (1.2%), some other form of insurance (4.1%), or did not know (1.2%).

Of the responding live kidney donors, 247 (89.5%) had a place they usually went to when they were sick or for advice regarding their health. Of these 247 donors, 88.0% reported that the place they usually went to was a doctor’s office. Of the 29 responding donors without a usual place to go to for their health care, 18 (62.1%) reported that they seldom or never get sick. Only 28 donors (10.1%) had changed their usual place of health care during the prior year.

Health care follow-up

Within the prior year, 87.7% of the responding live kidney donors had seen a physician about their own health, and 65.9% had seen a physician within the past 6 months (Table 3). Only 5.1% acknowledged not having seen a physician in over 2 years. Within the past year,

91.7% reported having their blood pressure checked by a health care professional, 66.7% reported having their kidney function checked by a blood test, and 68.8% reported having a urinalysis (Table 3).

We asked live donors about the types and specialties of physicians and health care providers they had seen in the prior 12 months. Most respondents (79.0%) had seen a general doctor who treats a variety of illnesses, such as their PCP, in the past year. Among the women, 62.2% had seen an obstetrician or gynecologist in the past year. In the preceding year, only 8.3% had seen a nephrologist, and 13.8% had seen a cardiologist.

Characteristics associated with lack of health care follow-up

In univariable analyses of the responding donors, lack of medical follow-up in the past year was associated with younger age at time of donation, lack of health insurance, and infrequent contact with the transplant recipient (Table 4). Lack of medical follow-up in the past year was not associated with race, sex, donor relationship to recipient, marital status, highest education level, household income, or years since donation. We did not perform multivariable logistic regression of factors associated with lack of medical follow-up, because there were insufficient events for multivariable adjustment (only 34 responding live donors (12.3%) reported not receiving medical care in the prior year).

Discussion

Among live kidney donors more than three years post-nephrectomy who responded to our questionnaire, most reported that they follow-up regularly with health care providers. Even without assistance from their transplant center, most responding live donors had recently obtained medical care and assessment of their kidney health. By self-report, in the prior year, 87.8% of responding donors had seen a physician or health care professional, and 79.0% had seen a general doctor. These follow-up rates among donors who responded to our survey likely overestimate follow-up among live donors who did not respond to our survey.

Our results suggest that efforts to improve follow-up of live kidney donors should focus upon the subset of donors who are less likely to follow-up. Among our responding donors, those who were younger or lacked current health insurance were less likely to have seen a health care provider in the past year. Providing lifelong basic medical insurance to live donors (25) may decrease the number of donors who lack health care access due to lack of insurance. In addition, donors who were younger, Black, or male were less likely to respond to our survey and probably less likely to follow-up. These donors, compared to other donors, may have a higher risk of ESRD (6, 9), although their overall ESRD rates are low and similar to the general population. Future studies should determine additional donor characteristics, other than demographics, associated with lack of follow-up. For example, lack of follow-up may occur more frequently among donors with poor knowledge of the rationale for post-donation follow-up.

The approximately 50% response rate to our mailed survey underscores the difficulty of maintaining contact between transplant centers and live donors for many years post-nephrectomy. Three to seven years after donation, half of our donors had either changed mailing addresses or lacked sufficient interest in responding to our survey. Transplant centers could consider focusing follow-up efforts on younger, Black or uninsured patients (i.e. those less likely to respond to our survey), to prospectively ensure that these patients do not “disappear” and become lost to follow-up.

Strengths and limitations

A strength of our study is that we directly contacted a diverse cohort of live donors who were at least three years post-donation. Another approach to determining health care utilization is to use administrative and insurance claims data (26), but many donors lack health insurance (27), change insurers, or are covered only briefly by a particular insurer (median of 2.1 years in one recent study) (26). Other studies have examined early donor follow-up, in the first year post-donation (28). Later donor follow-up is likely more important, because any end-stage renal disease among donors usually occurs many years post-donation (29, 30).

Our study also has several important limitations. First, the response rate to our mailed survey was suboptimal, because only 45.5% of donors provided usable responses to our mailed questionnaire. Other studies that mailed questionnaires to live kidney donors have also reported response rates of approximately 45% (31, 32). A few surveys of live donors, however, have reported response rates of up to 80% (33, 34). Of note, response rates by transplant programs to electronic surveys regarding live donor policies have ranged from 40% to 53% of all eligible programs (16, 20).

Second, our low response rate may have caused a selection bias. Our responding donors differed from non-responders and were possibly more likely to follow-up with their health care providers. Health care follow-up among our responding kidney donors may overestimate follow-up among non-responding donors and likely represents the ceiling for frequency of follow-up among donors in general.

Third, results from this single-center study are not necessarily generalizable to other transplant centers. Center-specific policies and procedures for educating and evaluating live kidney donors may impact those donors' likelihood of having regular medical follow-up. Compared to donors at other centers, our responding donors were possibly more likely to follow-up with PCPs, given their relative affluence (half had self-reported annual household income >\$80,000) and education (two-thirds had post-high school education). On the other hand, the demographics of our live donor population are similar to the general U.S. live donor population (35).

Fourth, we relied upon donors' self-report to determine their medical follow-up, so measurement error is possible. We were unable to correlate donors' self-reports with their actual medical records. On the one hand, social desirability bias may have led responding donors to overestimate their frequency of follow-up. On the other hand, validation studies comparing self-report to claims data suggest that patients may actually underreport use of outpatient health services (36).

Fifth, our small sample size precluded meaningful multivariable analysis. The lower odds of recent follow-up among younger or uninsured live donors could be confounded by other, unmeasured factors. In a multivariable analysis that adjusts for such confounders, it is possible that younger or uninsured donors may follow-up at similar frequencies to older or insured donors.

Finally, the ideal frequency of follow-up by live donors remains unknown. Lack of follow-up within the past year may not necessarily be associated with worse donor outcomes.

Conclusions

After nephrectomy, live kidney donors should regularly follow-up with health care providers. In this study, most donors who responded to our survey reported that they seek regular care with their doctors and other health care providers. The responding live donors

who failed to follow-up with health care providers tended to be younger at the time of donation and lack health insurance. Because our study only measured health care follow-up among donors who responded to the survey, our findings may overstate the frequency of donor follow-up. The transplant community should focus its resources most upon the subgroups of donors who have a higher risk for complications and lower likelihood of follow-up medical care.

Acknowledgments

This research was funded in part by grants from the Harvey E. Nussbaum, MD, Research Institute (F.L.W.) and from the National Institutes of Health (K23-DK078688, to P.P.R.). These data were presented, in part, in abstract form at the American Transplant Congress in Philadelphia, PA, in May 2011. We wish to thank Dr. Arthur Matas and his research team from the University of Minnesota, for sharing the questionnaires that they administer to their live kidney donors. We also thanks Drs. Pallavi Batwar, Nirav M. Jasani, and Dustin Johnson for assistance with data collection.

References

1. Organ Procurement and Transplantation Network Living Donor Committee. [Accessed 12/6/2010] Living donation. Available from: http://optn.transplant.hrsa.gov/PoliciesandBylaws2/policies/pdfs/policy_172.pdf
2. Brown RS Jr, Higgins R, Pruett TL. The evolution and direction of OPTN oversight of live organ donation and transplantation in the United States. *Am J Transplant*. 2009; 9:31. [PubMed: 18853948]
3. Ommen ES, Winston JA, Murphy B. Medical risks in living kidney donors: absence of proof is not proof of absence. *Clin J Am Soc Nephrol*. 2006; 1:885. [PubMed: 17699301]
4. Segev DL, Muzaale AD, Caffo BS, et al. Perioperative mortality and long-term survival following live kidney donation. *JAMA*. 2010; 303:959. [PubMed: 20215610]
5. Ibrahim HN, Foley R, Tan L, et al. Long-term consequences of kidney donation. *N Engl J Med*. 2009; 360:459. [PubMed: 19179315]
6. Cherikh WS, Young CJ, Kramer BF, Taranto SE, Randall HB, Fan PY. Ethnic and gender related differences in the risk of end-stage renal disease after living kidney donation. *Am J Transplant*. 2011; 11:1650. [PubMed: 21672160]
7. Boudville N, Prasad GV, Knoll G, et al. Meta-analysis: risk for hypertension in living kidney donors. *Ann Intern Med*. 2006; 145:185. [PubMed: 16880460]
8. Garg AX, Muirhead N, Knoll G, et al. Proteinuria and reduced kidney function in living kidney donors: A systematic review, meta-analysis, and meta-regression. *Kidney Int*. 2006; 70:1801. [PubMed: 17003822]
9. Gibney EM, Parikh CR, Garg AX. Age, gender, race, and associations with kidney failure following living kidney donation. *Transplantation Proceedings*. 2008; 40:1337. [PubMed: 18589100]
10. Gibney EM, King AL, Maluf DG, Garg AX, Parikh CR. Living kidney donors requiring transplantation: focus on African Americans. *Transplantation*. 2007; 84:647. [PubMed: 17876279]
11. Young A, Storsley L, Garg AX, et al. Health outcomes for living kidney donors with isolated medical abnormalities: a systematic review. *Am J Transplant*. 2008; 8:1878. [PubMed: 18671676]
12. Steiner RW. 'Normal for now' or 'at future risk': a double standard for selecting young and older living kidney donors. *Am J Transplant*. 2010; 10:737. [PubMed: 20199512]
13. Steiner RW. More on the increased risks of young kidney donors. *Am J Transplant*. 2011; 11:413. [PubMed: 21214857]
14. OPTN/UNOS Living Donor Committee. [Accessed 4/18/2011] Guidance for developing and implementing procedures to collect post-donation follow-up data from living donors. 2011. Available from: http://optn.transplant.hrsa.gov/ContentDocuments/Guidance_Post_Donation_Donor_Follow-Up.pdf
15. Dew MA, Olenick D, Davis CL, Bolton L, Waterman AD, Cooper M. Successful follow-up of living organ donors: strategies to make it happen. *Prog Transplant*. 2011; 21:94. [PubMed: 21736236]

16. Mandelbrot DA, Pavlakis M, Karp SJ, Johnson SR, Hanto DW, Rodrigue JR. Practices and barriers in long-term living kidney donor follow-up: a survey of U.S. transplant centers. *Transplantation*. 2009; 88:855. [PubMed: 19935453]
17. Leichtman A, Abecassis M, Barr M, et al. Living kidney donor follow-up: state-of-the-art and future directions, conference summary and recommendations. *Am J Transplant*. 2011; 11:2561. [PubMed: 22054039]
18. Davis CL, Delmonico FL. Living-donor kidney transplantation: a review of the current practices for the live donor. *J Am Soc Nephrol*. 2005; 16:2098. [PubMed: 15930096]
19. Kasiske BL, Ravenscraft M, Ramos EL, Gaston RS, Bia MJ, Danovitch GM. The evaluation of living renal transplant donors: clinical practice guidelines. Ad Hoc Clinical Practice Guidelines Subcommittee of the Patient Care and Education Committee of the American Society of Transplant Physicians. *J Am Soc Nephrol*. 1996; 7:2288. [PubMed: 8959619]
20. Mandelbrot DA, Pavlakis M, Danovitch GM, et al. The medical evaluation of living kidney donors: a survey of US transplant centers. *Am J Transplant*. 2007; 7:2333. [PubMed: 17845567]
21. National Center for Health Statistics, Centers for Disease Control and Prevention. National Health Interview Survey, 2006. 2007. Available from: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2006/English/QADULT.pdf
22. Agency for Healthcare Research and Quality. Access to Care section, Household Component, 2005 Medical Expenditure Panel Survey. 2006. Available from: http://www.meps.ahrq.gov/mepsweb/survey_comp/hc_survey/2005/AC95.pdf
23. Dillman, DA. 2007 Update with New Internet, Visual, and Mixed-Mode Guide. 2. Hoboken, New Jersey: John Wiley & Sons, Inc; 2007. Mail and Internet Surveys: The Tailored Design Method.
24. Hosmer, DW.; Lemeshow, S. Applied logistic regression. 2. New York: John Wiley & Sons, Inc; 2000.
25. Ommen ES, Gill JS. The system of health insurance for living donors is a disincentive for live donation. *Am J Transplant*. 2010; 10:747. [PubMed: 20121732]
26. Lentine KL, Schnitzler MA, Xiao H, et al. Racial variation in medical outcomes among living kidney donors. *N Engl J Med*. 2010; 363:724. [PubMed: 20818874]
27. Gibney EM, Doshi MD, Hartmann EL, Parikh CR, Garg AX. Health insurance status of US living kidney donors. *Clin J Am Soc Nephrol*. 2010; 5:912. [PubMed: 20413444]
28. Reese PP, Simon MK, Stewart J, Bloom RD. Medical follow-up of living kidney donors by 1 year after nephrectomy. *Transplantation Proceedings*. 2009; 41:3545. [PubMed: 19917341]
29. Fehrman-Ekholm I, Norden G, Lennerling A, et al. Incidence of end-stage renal disease among live kidney donors. *Transplantation*. 2006; 82:1646. [PubMed: 17198252]
30. Kido R, Shibagaki Y, Iwadoh K, et al. How do living kidney donors develop end-stage renal disease? *Am J Transplant*. 2009; 9:2514. [PubMed: 19681812]
31. Buell JF, Lee L, Martin JE, et al. Laparoscopic donor nephrectomy vs. open live donor nephrectomy: a quality of life and functional study. *Clin Transplant*. 2005; 19:102. [PubMed: 15659142]
32. Sharp J, McRae A, McNeill Y. Decision making and psychosocial outcomes among living kidney donors: a pilot study. *Prog Transplant*. 2010; 20:53. [PubMed: 20397347]
33. Lennerling A, Forsberg A, Meyer K, Nyberg G. Motives for becoming a living kidney donor. *Nephrol Dial Transplant*. 2004; 19:1600. [PubMed: 15004261]
34. Stothers L, Gourlay WA, Liu L. Attitudes and predictive factors for live kidney donation: a comparison of live kidney donors versus nondonors. *Kidney Int*. 2005; 67:1105. [PubMed: 15698451]
35. U.S. Department of Health and Human Services, Health Resources and Services Administration, Healthcare Systems Bureau, Division of Transplantation. 2009 Annual Report of the US Organ Procurement and Transplantation Network and the Scientific Registry of Transplant Recipients: Transplant Data 1999–2008. Rockville, MD: 2009.
36. Zuvekas SH, Olin GL. Validating household reports of health care use in the Medical Expenditure Panel Survey. *Health Serv Res*. 2009; 44:1679. [PubMed: 19619249]

Table 1

Demographics and characteristics of responding versus non-responding live kidney donors *

	Responding donors	Non-responding donors	P-value
N	276	330	
Median age at living donation, in years	45.7 (38.2 – 52.3)	37.4 (31.1 – 45.5)	<0.0001
Median age at time of survey, in years	52.0 (44.2 – 57.9)	44.3 (37.7 – 51.9)	<0.0001
Median years since living donation	6.2 (4.8 – 7.8)	6.5 (5.0 – 8.1)	0.13
Female sex, N (%)	188 (68.1%)	185 (56.1%)	0.002
Race/ethnicity, N (%)			<0.001
White	209 (75.7%)	172 (52.1%)	
Black	30 (10.9%)	75 (22.7%)	
Hispanic	27 (9.8%)	59 (17.9%)	
Other	10 (3.6%)	24 (7.3%)	
Donor relationship to recipient, N (%)			<0.001
Sibling	83 (30.1%)	115 (34.9%)	
Child	42 (15.2%)	70 (21.2%)	
Parent	31 (11.2%)	41 (12.4%)	
Other blood relative	16 (5.8%)	20 (6.1%)	
Spouse	64 (23.2%)	31 (9.4%)	
Other non-relative	34 (12.3%)	51 (15.5%)	
Non-directed	6 (2.2%)	2 (0.6%)	

* Responding donors were defined as donors who returned a questionnaire with at least 80% of items completed

Table 2

Additional characteristics of 276 responding live kidney donors

Current marital status, N (%)	
Now married	191 (69.2%)
Widowed	15 (5.4%)
Divorced	20 (7.3%)
Separated	8 (2.9%)
Never married	29 (10.5%)
Civil union/domestic partnership	11 (4.0%)
No response	2 (0.7%)
Highest schooling completed, N (%)	
No schooling	1 (0.4%)
Up to 8 th grade	3 (1.1%)
High school, no diploma	12 (4.4%)
High school graduate	79 (28.6%)
Some college, no degree	61 (22.1%)
Associate or bachelor's degree	78 (28.3%)
Post-college degree	41 (14.9%)
No response	1 (0.4%)
Current annual household income, N (%)	
<\$10,000	6 (2.2%)
\$10,000 to \$19,999	14 (5.1%)
\$20,000 to \$29,999	9 (3.3%)
\$30,000 to \$39,999	15 (5.4%)
\$40,000 to \$49,999	19 (6.9%)
\$50,000 to \$59,999	21 (7.6%)
\$60,000 to \$79,999	30 (10.9%)
\$80,000 to \$99,999	41 (14.9%)
\$100,000 to 199,999	71 (25.7%)
\$200,000 or more	27 (9.8%)
No response	23 (8.3%)
Current employment status, N (%)	
Working full-time	168 (60.9%)
Working part-time	32 (11.6%)
Working, full-time or part-time unknown	4 (1.5%)
Not working, disabled	7 (2.5%)
Not working, retired	23 (8.3%)
Not working, unable to find work	17 (6.2%)
Not working, other reason	25 (9.1%)

Table 3

Self-reported medical follow-up by live kidney donors

	6 months or less	>6 months but 1 year	>1 year but 2 years	>2 years but 5 years	More than 5 years ago	Don't know
How long has it been since you last saw/talked to a doctor/other health care professional about your own health? *	182 (65.9%)	60 (21.7%)	18 (6.5%)	9 (3.3%)	5 (1.8%)	1 (0.4%)
How long has it been since you last had your BLOOD PRESSURE checked by a doctor or other health care professional?	196 (71.0%)	57 (20.7%)	10 (3.6%)	8 (2.9%)	3 (1.1%)	2 (0.7%)
How long has it been since you last had your CHOLESTEROL checked by a blood test?	144 (52.2%)	77 (27.9%)	27 (9.8%)	13 (4.7%)	7 (2.5%)	8 (2.9%)
How long has it been since you last had your KIDNEY FUNCTION checked by a blood test? *	110 (39.9%)	74 (26.8%)	26 (9.4%)	28 (10.1%)	13 (4.7%)	24 (8.7%)
How long has it been since you last had a URINE TEST (urinalysis)? *	110 (39.9%)	80 (29.0%)	32 (11.6%)	30 (10.9%)	11 (4.0%)	12 (4.4%)

* No response to this item occurred in 1 live donor (0.4%)

Table 4

Univariable analyses of factors associated with lack of medical care in prior one year

	Odds ratio	P-value
Black race (vs. non-black)	1.95 (0.73 – 5.17)	0.18
Age at time of donation (vs. <40 years old)		0.03
40 to <50	0.41 (0.18 – 0.94)	
50 to <60	0.27 (0.10 – 0.78)	
60 and older	0.23 (0.03 – 1.87)	
Years since donation (vs. 3–5 years)		0.42
>5 to 7 years	1.56 (0.64 – 3.78)	
>7 years	0.95 (0.38 – 2.37)	
Male (vs. female)	1.59 (0.76 – 3.32)	0.22
Annual household income (vs. <\$60,000)		0.34
\$60,000 to <\$100,000	0.50 (0.19 – 1.31)	
>\$100,000	0.52 (0.22 – 1.24)	
No response	0.44 (0.09 – 2.07)	
Donor relationship to recipient (vs. sibling)		0.66
Child	0.80 (0.26 – 2.44)	
Parent	0.63 (0.17 – 2.42)	
Other relative	1.37 (0.34 – 5.52)	
Spouse	0.39 (0.12 – 1.29)	
Other non-relative	1.27 (0.43 – 3.71)	
Non-directed	1.18 (0.13 – 11.0)	
Currently married (vs. not married)	0.79 (0.37 – 1.68)	0.55
Currently lacks health insurance (vs. has health insurance)	3.78 (1.62 – 8.85)	0.002
Has not spoken to recipient in past one week (vs. spoke to recipient in past one week)	2.24 (1.08 – 4.68)	0.03