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The Living Kidney Donor: Immediate and Long Term Insurability

John R. Iacovino, MD, FACP, FACC, DBIM

What is the survival of a life insurance applicant who is planning to or has previously donated a kidney? The medical director needs to assess short- and long term risk stratification in each scenario. For expectant and immediate post-donor applicants, a waiting period of 3 months is appropriate for insurability. Long-term post-donor applicants are, at best, standard risks due to the absence of renal reserve. For those with accompanying impairments such as hypertension and diabetes, which accelerate renal deterioration, adding debits to the basic rating is appropriate.

Address for Correspondence:
jiacovino@fasanoassociates.com

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SHORT-TERM SURVIVAL

Over the past 30 years, 90-day post-operative death of live kidney donors has diminished dramatically. Donor mortality decreased from 3 in 1993-2002 to less than 1/10,000 in 2013-2022, Figure 1.[1] Most of this improvement can be attributed to laparoscopic surgery replacing open kidney removal. Additionally, improved donor selection, and peri- and post-operative care have contributed to improved survival.

A short-term survival analysis[1] followed 164,593 living donors; 36 died within 90 days of donation over the 30-year period and are represented by Figure 2.[1] Thirteen deaths from 1993-2002, 18 deaths from 2002-2012 and only 5 deaths 2013-2022. Only 19 of the total 36 deaths had a reported cause. Deaths were due to post-operative hemorrhage (8), infection (2), pulmonary embolism (2), cardiovascular disease (2), and cerebral vascular accident (1). Other reported deaths not likely related to the post-donor complications were homicide (1) and cause not specified (3).

OBSERVED MORTALITY

Figure 2[1] shows the overall risk of mortality per 10,000 donors over the 90-day post-operative observation period at 10-day intervals. Mortality is high in the first 20 days, with about 50% of deaths occurring within the first 10 days. Thereafter, mortality was somewhat stable in days 21-50 and then gradually increased to 2.3 deaths per 10,000 in days 51 to 90.

Figure 1[1] illustrates risks by era. We need to focus on the most recent era of 2013 to 2022. Only 5 deaths were reported in this decade. The risk of death was less than 1 per 10,000 for the 8 out of the 19 reported deaths whose cause was known. The effect on observed mortality, if those lost to follow up were included, is unknown. Mortality of donor subgroups revealed male donors had 4 times the risk of death compared to females. Donors with preexisting hypertension had a nearly 5 times higher risk of death than those normotensive. Elevated BMI also conferred an increased risk of death post donation. Nineth day mortality was highest in ages less

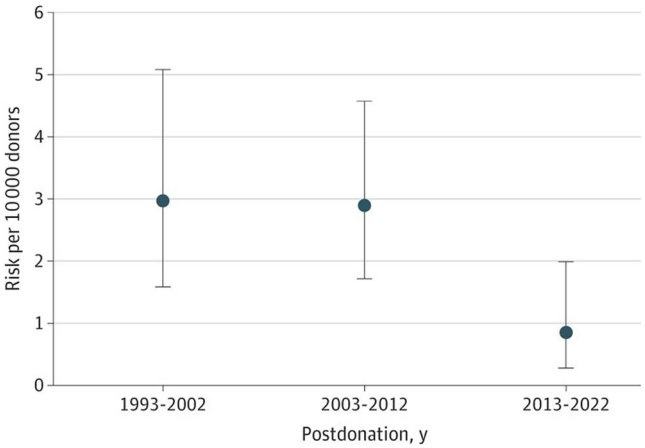

Figure 1. *90-day mortality risk by era.*

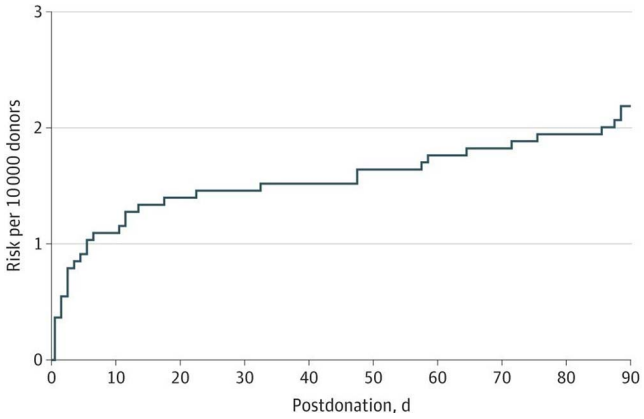

Figure 2. *Overall risk of mortality in the first 90 days after donor nephrectomy.*

than 40 to 49. Age 50 and over had 50% of the mortality of the previous group.

EXPECTED MORTALITY

The authors did not include a comparative, expected mortality for a similar population for the study period. Based on the demographics of the donor cohort it is challenging to create a meaningful expected table for this population. Too many assumptions would be needed to make it statistically meaningful. However, an approximation is possible. The population of donors is a medically selected cohort similar to those applying for life insurance. Donors with impairments affecting the health of the donated kidney were excluded. The ages of the donors were two-thirds under age 50 and were likely free of overt cardiovascular disease and malignancies. A 2021 US population expected mortality table[2] revealed for females, the approximate expected mortality rate at ages 35-44 was 2 deaths and for ages 45-54, 4 deaths per 1000. For males, rates for the same age groups were 3 and 6.7 deaths per 1000. These yielded an average expected mortality rate per 10,000 for males, ages 35-54, of 5.2, for females about 3.0.

OVERALL SURVIVAL ANALYSIS

The very approximate expected mortality rates for males and females are similar to the observed mortality rates noted by the authors, yielding crude mortality ratios of about 100%, broadly confirming the safety of a standard issue in post-nephrectomy donors.

Long-Term Complications and Survival[3]

A prospective 7-year cohort study comparing living kidney donors and non-donors in Canada and Australia investigated the risk of hypertension and albuminuria in healthy, normotensive donors compared to healthy, normotensive non donors. Additionally, each group was followed for the rate of estimated glomerular filtration rate (eGFR) decline. Post nephrectomy donors immediately lost 50% of their glomeruli; however, the kidney slowly undergoes adaptation. The eGFR in donors decreased post operatively from about 100 to 66, then rose, within 12 months, to 60% to 75% of pre-donation levels. The mean decrease in donor eGFR was -32. At the final follow up, the eGFR in donors was 67 and in nondonors 91. The study found comparable numbers of donors and non-donors developed hypertension over the 7-year follow up. Albuminuria showed no meaningful difference between the donors and non-donors.

UNDERWRITING SUGGESTIONS FOR KIDNEY DONORS

Kidney donors present a potential mortality risk both early and late post donation. Most importantly, donors are uni-organ with

no renal reserve; thus, if the remaining kidney is damaged or has the potential to be damaged by impairments such as diabetes or hypertension, the mortality risk will be greater than anticipated, and additional adverse action should be considered. Immediate insurability, upon application, is questionable since 75% of donor deaths occur within the first 90 days post operatively. Beyond a standard risk classification is appropriate. Preferred, in my opinion, should never be available to donor applicants due to their absence of renal reserve. The reduced eGFR alone should not create an adverse underwriting action unless lower than anticipated or trending inappropriately lower. Donors with preexisting hypertension have 5 times the observed mortality of normotensive donors and should be underwritten accordingly.

REFERENCES

1. Massie A, Motter JD, Snyder JJ, Levan ML, Segev DL. Thirty Year Trends in Perioperative Mortality Risk for Living Kidney Donors. *JAMA*. 2024;332:1015–1016. doi: 10.1001/jama.2024.14527
2. Death Rate in the United States in 2021, by Age and Gender (per 100,000 of population). Statisca.com
3. Garg A, Arnold JB, Cuerden MS, et al. Hypertension and Kidney Function After Living Kidney Donation. *JAMA*. 2024;332:287–299. doi: 10.1001/jama.2024.8523