

INVITED COMMENTARY

Elderly kidney donors: better than their reputation —but where are the limits?

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Kidney allografts from elderly donors bear higher peri- and post-transplant risks, such as delayed graft function with or without need for dialysis, lower allograft function at the early phase, and shorter allograft survival. In contrast, allografts from younger donors perform better—in young and old recipients. Thus, in a perfect world without organ shortage, allograft from younger donors would be preferred irrespective of the recipient's age. So far, the maths is simple.

However, we live in a world where need and supply of organs continue to diverge (Fig. 1), and the waiting time for a kidney has risen to several years in most Western countries. In this context, transplant physicians have started to explore the option of using elderly and old deceased donors in order to reduce waiting times and improve quality of life when compared to staying on dialysis treatment. In parallel—and thanks to effective new traffic laws—the “standard” deceased donor is not a young traffic victim anymore, but a middle-aged person dying from a stroke. Both trends have significantly increased donor age in the last 20 years (Fig. 2). Thus, the question arises, what the best use of organs from elderly donors might be.

Taking the position of the entire community of waiting patients, the survival of each transplanted organ should be optimized. This means that death of the

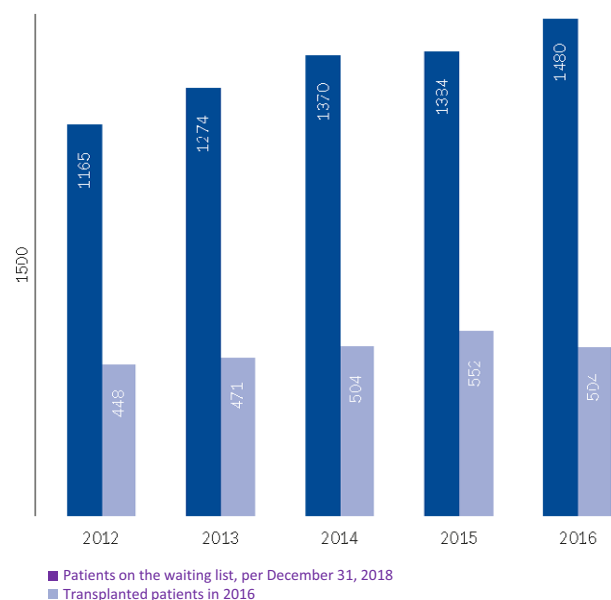


Figure 1 Divergence of demand and supply of solid organs in Switzerland. A 5-year time period from 2012 until 2016 is shown (Source: Swisstransplant Annual Report 2016).

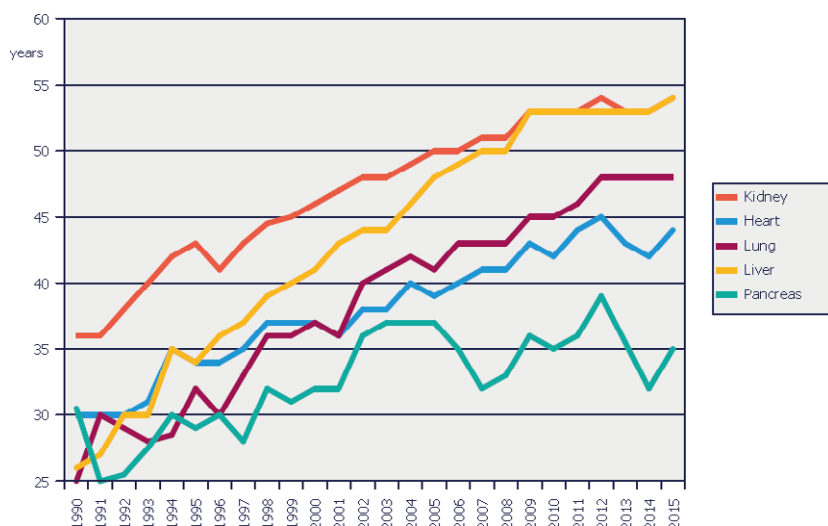


Figure 2 Median age of deceased donors used for organ transplantation in Europe. The 25-year time period from 1990 until 2015 is shown (Source: Eurotransplant Annual Report 2015).

patient and graft loss due to other reasons should come as close together as possible, which argues for using organs from elderly donors also for elderly recipients (as for example in the Eurotransplant Senior Program [1]). In contrast, the wish of an individual might primarily be to receive an organ as young as possible. However, as this increases waiting time on dialysis, the optimization leads to acceptance of an older organ in trade of a shorter waiting time on dialysis. Although the two views of community and individual somewhat differ, they are not mutually exclusive.

In order to define the optimal use of organs from elderly donors, we need to more precisely know how they perform in a period of modern immunosuppression. To offer an answer to this question, in this issue of *Transplant International*, Pippias *et al.* [2] present a study based on the ERA-EDTA registry: They analyzed the survival of more than 1400 kidney allografts from donors between 55 and 70 years old, when one kidney was transplanted into a recipient of a similar age (age difference between donor and recipient <5 years) and the other kidney into a significantly younger recipient (group 1: age difference 8.1 years [$>5/<13$]; group 2: age difference 20 years [>13]). This methodology eliminates the influence of specific donor factors apart from age itself. As a result, kidneys from elderly donors performed acceptably well. There was about a 10% lower allograft survival after 10 years in older recipients, which was mainly due to a higher rate of patient deaths, whereas death-censored allograft failure was higher in younger recipients. Furthermore, the authors analyzed the restricted mean number of functioning graft years limited to 10 years, and this was only 6 months longer in young compared to old recipients (7.5 vs. 7 years). Thus, the authors conclude that outcomes of deceased

donor allografts into differing donor-recipient age groups are better than previously reported.

In principle, the results of this study are reassuring that transplantation of kidneys from elderly donors can be recommended also for younger recipients when the alternative is staying on dialysis. However, the study has several important limitations:

1. Only allografts from elderly (55–70), but not old or very old donors were included. Thus, the results cannot be expanded to the donor population of octogenarians which is also increasing. Normal aging of a kidney includes decline of GFR, and in donors aged 75, 80, or even 85, a limit may be reached, where transplantation of double kidneys should be evaluated to still achieve a reasonable renal function in younger recipients [3]. A biopsy-guided approach may be helpful for this decision [4].
2. When accepting organs from elderly donors, additional risks apart from donor age should be carefully balanced. Such factors are ischemia time, sensitization of the recipient, other donor risk factors such as diabetes, hypertension, acute kidney injury, and others [5]. In the study by Pippias *et al.* [2], this analysis could not be carried out either because the data were not available or because the design of studying paired recipients from the same donors excluded the analysis of specific donor factors other than age. However, a very recent analysis from the Eurotransplant Senior Program clearly shows that transplantation of elderly organs into elderly recipients increases recipient mortality (compared to younger donor organs) and that a limit may be reached, where it equals survival on dialysis [6].

3. No pediatric recipients were included in this study, and the results should not be expanded to this group. Most transplant physicians would be very reluctant to use elderly donors for recipients with a long-life expectancy such as pediatric recipients. For this population, living donation should be actively supported to allow for transplantation as early as possible [7].

In conclusion, the outcome of transplantation of kidneys from elderly donors may be better than its reputation. However, careful research should continue on this question in a time period, where transplantation of extended criteria donors is increasing, and accumulation of risk factors in addition to donor age should be studied with scrutiny. Novel approaches such as

biopsy-guided decisions to optimize donor selection and individualization of post-transplant immunosuppression in order to reduce risks of infection and rejection might help to improve outcome in this vulnerable population [8,9].

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Conflict of interests

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