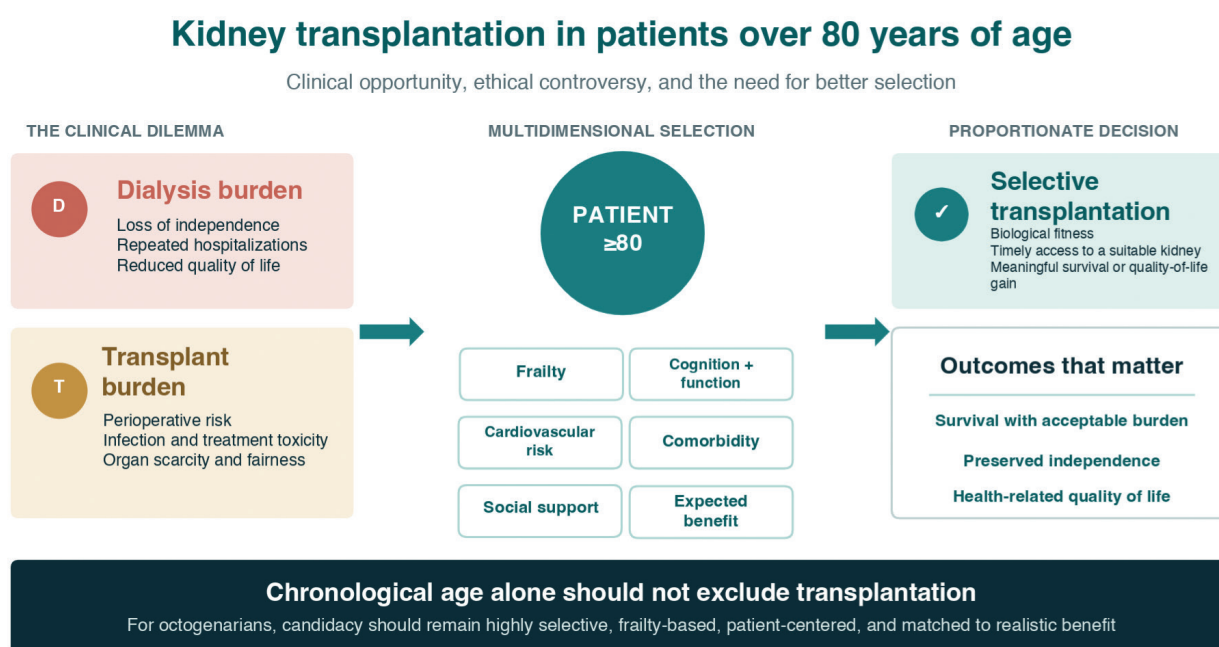


Kidney transplantation in patients over 80 years of age: clinical opportunity, ethical controversy, and the need for better selection

Belinda De Simone,¹ Fausto Catena²

¹Department of Emergency and General Minimally Invasive Surgery, Level I Trauma Center, Bufalini Hospital, AUSL Romagna, Cesena (FC); ²Department of Medical and Surgical Sciences, Alma Mater Studiorum, University of Bologna, Italy

Graphical abstract



Abstract

Population aging is steadily increasing the number of very elderly patients reaching end-stage kidney disease, making kidney transplantation in octogenarians an increasingly relevant clinical issue rather than a rare exception. Although dialysis is often viewed as the default treatment in this age group, it is not a neutral alternative, as it may be associated with reduced survival, loss of independence, repeated hospitalizations, and impaired quality of life. At the same time, transplantation beyond 80 years remains controversial because it brings together frailty, multimorbidity, perioperative risk, immunosenescence, and the ethical challenge of allocating scarce donor organs in the presence of competing demands from younger recipients. In our view, transplantation in carefully selected octogenarians should neither be denied solely on the basis of chronological age nor normalized as a routine extension of standard transplant practice. Rather, it should remain a highly selective strategy, reserved for patients with favorable biological fitness, limited frailty, realistic access to transplantation, and a credible likelihood of meaningful benefit in survival or quality of life. The key issue is therefore not simply whether transplantation can be performed after 80 years of age, but which older patients are most likely to benefit, which kidneys should be offered to them, and how transplant programs should balance individual benefit, fairness, and sustainability. Current evidence suggests that selected elderly recipients may achieve acceptable post-transplant outcomes and better health-related quality of life than waitlisted or dialyzed counterparts, but data specifically focused on recipients over 80 years remain limited. Better frailty-based selection tools, more patient-centered outcomes, and allocation strategies tailored to the very elderly are still needed in a field where demographic pressure is growing faster than the evidence base.

Key words: octogenarians; kidney transplantation; frailty; organ allocation; biological age; quality of life.

Correspondence to: Belinda De Simone, MD, PhDc, Department of Emergency and General Minimally Invasive Surgery, Level I Trauma Center, Bufalini Hospital, Viale Giovanni Ghirelli, 286, 47521 Cesena (FC), Italy. Tel.: +33665787872; E-mail: desimone.belinda@gmail.com

Introduction

Kidney transplantation is widely accepted as the preferred form of kidney replacement therapy for suitable patients with end-stage kidney disease. This principle, however, becomes less straightforward when the potential recipient is over 80 years old. What was once an exceptional scenario is now becoming a more frequent clinical reality, driven by population aging, longer survival with chronic disease, and broader access to renal replacement therapies.¹⁻³

Yet transplantation in this age group cannot be approached as a simple extension of standard practice. In octogenarians, frailty, sarcopenia, cardiovascular disease, cognitive vulnerability, and the risk of death from comorbid conditions unrelated to kidney failure may substantially alter the balance between the expected benefits and burdens of transplantation.^{1,2,4-6} Moreover, transplantation does not take place in a resource-neutral environment. Donor kidneys are limited, waiting times remain substantial, and allocation decisions inevitably raise questions of proportionality, utility, and fairness.⁷⁻⁹ For this reason, the real issue is not whether kidney transplantation after 80 is technically feasible, but under which circumstances it remains clinically appropriate and ethically justifiable.

In our view, chronological age alone should not be treated as an absolute barrier.^{1,2,4} At the same time, transplantation in very elderly patients should not be promoted uncritically or framed as routine care. It should remain a deliberately selective strategy, supported by careful multidimensional assessment, realistic counseling, and explicit reasoning about expected benefit and proportionality.

Dialysis is not a neutral alternative

Any serious discussion of transplantation in octogenarians must begin by acknowledging that dialysis is not a benign fallback option. In very elderly patients, dialysis is frequently associated with substantial physical and psychological burden, progressive dependence, recurrent healthcare contact, and loss of autonomy.¹⁻³ For some, it may prolong survival, but at the cost of daily functioning and quality of life. The argument against transplantation cannot therefore rest on the assumption that dialysis is always the safer or more proportionate choice.

This point matters because treatment goals in very elderly patients often extend beyond survival alone. Preserving independence, reducing symptom burden, and maintaining an acceptable quality of life may matter as much as, or even more than, modest gains in life expectancy. In this setting, the recent TransplantLines study is particularly informative: older recipients had significantly better physical and mental health-related quality of life than older waitlisted patients, and paired analyses showed clear improvement in physical quality of life after transplantation.¹⁰ These findings do not mean that transplantation is preferable in every case, but they do remind us that the alternative is itself burdensome and imperfect.

The comparison, then, is not between a risky intervention and a neutral default. It is between two imperfect strategies, each with its own risks, limitations, and implications for survival, function, and daily life.

Why transplantation beyond 80 years remains controversial

The controversy surrounding kidney transplantation in patients over 80 is both real and understandable. It arises from the conver-

gence of biological vulnerability, organ scarcity, and uncertainty about the true magnitude of benefit in the very old.

Older recipients are an extremely heterogeneous group. Some octogenarians remain functionally independent, cognitively intact, and biologically robust, whereas others are severely frail and unlikely to tolerate the surgical and immunological demands of transplantation. Chronological age clearly fails to capture this heterogeneity. Still, the fact that age is an imperfect criterion does not make it irrelevant. If anything, transplantation after 80 should prompt more stringent evaluation, not less.^{4,5}

The ethical dimension is equally important. A donor kidney is a scarce resource, and every allocation decision has implications beyond the individual patient. When an organ with potentially long graft survival is allocated to a recipient with limited life expectancy, the tension between individual benefit and broader utility becomes difficult to ignore.⁷⁻⁹ This does not justify excluding older patients solely on the basis of age, but it does mean that transplantation in octogenarians requires a stronger justification than technical feasibility or the understandable wish to avoid dialysis.

The available evidence supports caution rather than therapeutic enthusiasm. In a recent systematic review and meta-analysis including more than 293,000 transplant recipients, elderly recipients older than 70 years had worse overall survival at all time points and worse long-term graft survival than younger recipients, while delayed graft function, acute rejection, death with functioning graft, and graft loss were not clearly inferior.¹¹ Importantly, postoperative complications were under-reported, and the authors emphasized the need for geriatric or frailty assessment to improve selection. Taken together, these findings argue for a selective rather than expansionist approach.

Beyond chronological age: frailty, biological fitness, and candidate assessment

If transplantation beyond 80 is to remain both clinically sound and ethically defensible, candidate selection must move beyond chronological age and focus on biological fitness. This is often stated in principle, but it is still inconsistently translated into practice.^{1,2,4}

Standard transplant evaluation has traditionally focused on cardiovascular suitability, surgical risk, and organ-specific criteria. While these remain essential, they are not enough in very elderly candidates. Frailty, cognitive status, mobility, sarcopenia, nutritional reserve, functional independence, and social support all have a major influence on post-transplant outcomes and on the patient's ability to benefit meaningfully from transplantation.^{1,2,5} A technically successful transplant may still prove clinically disappointing if it is followed by prolonged recovery, recurrent hospitalizations, or loss of independence.

Frailty deserves particular attention because it captures cumulative vulnerability that may not be apparent during routine clinical assessment. Frailty has been associated with worse post-transplant outcomes, including higher mortality, and is increasingly recognized as a central part of transplant decision-making in older adults.⁶ This is also reflected in more recent literature, which emphasizes the importance of incorporating geriatric and frailty assessment into candidate evaluation.^{1,11}

In practical terms, candidates over 80 should probably represent only a small and highly selected subgroup. They should have limited frailty, preserved or only mildly impaired cognition, an acceptable cardiovascular profile, manageable comorbidity, realistic access to an organ within a timeframe compatible with their life

expectancy, and treatment goals genuinely aligned with transplantation. Patients with severe frailty, marked cognitive decline, unstable multimorbidity, or little chance of meaningful functional recovery are unlikely to derive sufficient benefit, even if transplantation remains technically possible.

Which kidneys for which elderly recipients?

In very elderly candidates, the question is not only who should receive a transplant, but also what kind of kidney should be offered and under what allocation logic. In this setting, donor selection is not a secondary technical issue; it is part of the ethical and clinical decision itself.

The principle of proportionality is particularly important here. Donor organ quality, expected graft longevity, waiting time, and recipient life expectancy need to be considered together. In older recipients, the aim is not necessarily to maximize graft survival over decades, but to achieve timely transplantation that offers meaningful benefit within the patient's likely lifespan.^{7,8} This is the rationale behind age-matched allocation strategies such as the Eurotransplant Senior Program, which seek to shorten waiting time and reduce cold ischemia time by allocating older kidneys to older recipients.⁷

That said, such strategies are not without trade-offs. The recent UK cohort study examining the 2019 kidney offering scheme found that, among recipients aged 60 years or older, the new scheme was associated with higher odds of re-intervention, critical care admission, and cytomegalovirus viremia, together with less favorable human leukocyte antigen matching.⁹ This is a useful reminder that “older kidney for older recipient” is not automatically synonymous with better care. Matching strategy, donor quality, immunological burden, and perioperative consequences still matter.

Living donation also deserves careful consideration. In elderly recipients, Tegzess *et al.* found no significant difference in patient survival at 1 and 5 years between living donor, standard deceased donor allocation, and Eurotransplant Senior Program grafts, although death-censored graft survival was clearly better in the living donor group.¹² In other words, superior graft quality does not necessarily translate into equally large gains in patient survival when remaining life expectancy is already constrained by age and comorbidity. For octogenarians, then, the relevant question is not simply whether a kidney is available, but whether the specific kidney offered is proportionate to the likely benefit for that individual patient.

Benefits, risks, and the fragility of post-transplant advantage

There is little doubt that selected elderly recipients can do well after kidney transplantation, and this should not be underestimated. Contemporary series show that older recipients can achieve acceptable short- and intermediate-term outcomes, and in the right patient, transplantation may offer a meaningful period free from dialysis, with better daily functioning and better perceived health.^{1,10,13}

At the same time, the post-transplant advantage in the very old is often precarious. It depends not only on surviving the operation, but also on avoiding major complications, maintaining adequate graft function, and preserving functional independence afterward. In octogenarians, even limited setbacks may have disproportionate consequences. A postoperative complication, a serious infection,

or drug-related toxicity may quickly erase the anticipated benefit.

Aging further complicates this balance through immunosenescence and altered pharmacokinetics. Older recipients may experience lower rejection risk, but they are often more vulnerable to infection, malignancy, and treatment-related toxicity.^{1,2,14} This has important practical implications: immunosuppression in the very old should not simply mirror protocols designed for younger recipients. It should be individualized, and often moderated, according to competing risks.

Another issue that deserves emphasis is death with a functioning graft. In very elderly recipients, this is not an unusual outcome and reflects the fact that graft survival may outlast patient survival.^{1,15} Clinically, this does not negate the value of transplantation if the patient has gained meaningful time free from dialysis and retained quality of life. From an allocative perspective, however, it strengthens the argument for careful matching between donor organ, recipient prognosis, and expected benefit.

Cost-effectiveness, sustainability, and resource stewardship

The question of transplantation after 80 years of age also belongs within the broader discussion of health-system sustainability. This is a sensitive issue, but avoiding it does not make it less relevant. Population aging is increasing the prevalence of advanced kidney disease, while healthcare systems are facing rising financial pressure, workforce limitations, and growing demand for complex chronic care.^{1,2}

This does not mean that older patients should be reduced to an economic calculation. It does mean, however, that stewardship of limited resources is part of responsible clinical decision-making. Classic decision-analysis data suggest that kidney transplantation may remain cost-effective in older patients when compared with chronic dialysis.⁸ However, this principle cannot be applied mechanically to all octogenarians. In this age group, cost-effectiveness is likely to depend heavily on candidate selection, time to transplantation, postoperative burden, frailty profile, and the extent to which transplantation yields real gains in survival or quality of life.

In our view, concerns about sustainability should never be used to justify crude age-based exclusion. They should instead encourage greater precision, better stratification, and more honest discussion about which very elderly patients are most likely to benefit enough to justify the clinical, organizational, and allocative investment that transplantation requires.

The evidence gap and the need for better research

One of the main reasons why this field remains unsettled is the weakness of the evidence specifically focused on recipients over 80 years. Much of the available literature refers to “elderly” recipients older than 65 or 70 years, while true octogenarians remain underrepresented.^{1,11} The studies that do address this age group are mostly retrospective and strongly affected by selection bias, since only the fittest very elderly patients are likely to reach transplantation.^{13,15}

This matters because the outcomes that are most relevant to octogenarian patients are not fully captured by conventional trans-

plant metrics. Graft survival and patient survival remain important, but they are not enough. What is still lacking are robust data on frailty-adjusted benefit, functional recovery, cognitive trajectory, caregiver burden, hospitalization burden, patient-reported outcomes, and real-world cost-effectiveness in the very old.^{1,2,10,11}

Research in this area also needs to move beyond the simple question of whether transplantation can be performed. It should address how to select candidates more accurately, how to individualize donor-recipient matching, and how to define benefit in terms that matter most to elderly patients themselves. Until such data are available, clinicians will continue to rely heavily on extrapolation and judgment in a field where the clinical need is increasing faster than the evidence.

Conclusions

Kidney transplantation in patients over 80 years of age should be viewed neither as an outdated taboo nor as a routine extension of standard transplant practice. It may be appropriate in a small subgroup of biologically fit, carefully selected octogenarians, particularly when dialysis is unlikely to offer acceptable survival or quality of life. At the same time, the controversy surrounding transplantation in this population is legitimate and should not be understated. It reflects not only concerns about perioperative and post-transplant risk, but also broader questions of allocation, proportionality, and sustainability.

In our view, transplantation beyond 80 should not be denied solely on the basis of chronological age. However, it should remain a deliberately selective practice, guided by frailty assessment, biological fitness, realistic access to transplantation, donor-recipient proportionality, and transparent ethical reasoning. The field now needs better evidence specifically focused on octogenarians, because the demographic pressure to treat these patients is increasing faster than the data needed to guide those decisions responsibly.

References

- Black MW, Romine MM, Leiser DB. Renal Transplantation in Older Adults, an Updated Review. *Curr Transpl Rep* 2024;11: 153-9.
- Guzzi J, Strand E, Ozturk B, et al. Liver and Kidney Transplantation in Elderly Patients. *Transplantation* 2024;5: 98-109.
- Singh P, Ng YH, Unruh M. Kidney Transplantation Among the Elderly: Challenges and Opportunities to Improve Outcomes. *Adv Chronic Kidney Dis* 2016;23:44-50.
- Kodali L, Turner A. When are you too old to get a kidney transplant? *Curr Opin Nephrol Hypertens* 2019;28:593-9.
- Barbachowska A, Gozdowska J, Durlak M. Kidney Transplantation in Older Recipients Regarding Surgical and Clinical Complications, Outcomes, and Survival: A Literature Review. *Geriatrics (Basel)* 2024;9:151.
- McAdams-DeMarco MA, Law A, King E, et al. Frailty and mortality in kidney transplant recipients. *Am J Transplant* 2015; 15:149-54.
- Dreyer GJ, de Fijter JW. Transplanting the Elderly: Mandatory Age- and Minimal Histocompatibility Matching. *Front Immunol* 2020;11:359.
- Jassal SV, Krahn MD, Naglie G, et al. Kidney transplantation in the elderly: a decision analysis. *J Am Soc Nephrol* 2003; 14:187-96.
- Edginton O, George M, Bandara C, et al. Renal transplantation in older adults: retrospective cohort study to examine the impact of the new 2019 kidney offering scheme on older adult transplant recipients. *Ann R Coll Surg Engl* 2025;107:403-10.
- de Boer SE, Knobbe TJ, Kremer D, et al. Kidney Transplantation Improves Health-Related Quality of Life in Older Recipients. *Transpl Int* 2024;37:12071.
- Artiles A, Domínguez A, Subiela JD, et al. Kidney Transplant Outcomes in Elderly Population: A Systematic Review and Meta-analysis. *Eur Urol Open Sci* 2023;51:13-25.
- Tegzess E, Gomes Neto AW, Pol RA, et al. Comparative survival of elderly renal transplant recipients with a living donor versus a deceased donor: A retrospective single center observational study. *Transpl Int* 2021;34:2746-54.
- Neri F, Furian L, Cavallin F, et al. How does age affect the outcome of kidney transplantation in elderly recipients? *Clin Transplant* 2017;31:e13036.
- Lentine KL, Cheungpasitporn W, Xiao H, et al. Immunosuppression Regimen Use and Outcomes in Older and Younger Adult Kidney Transplant Recipients: A National Registry Analysis. *Transplantation* 2021;105:1840-9.
- Rao PS, Merion RM, Ashby VB, et al. Renal transplantation in elderly patients older than 70 years of age: results from the Scientific Registry of Transplant Recipients. *Transplantation* 2007;83:1069-74.

Received: 29 April 2026; Accepted: 11 September 2026.

Conflict of interest: the authors have no conflict of interest to declare. BDS is a member of the editorial board of *Surgery in Geriatrics and Frailty*. FC is Editor-in-Chief of *Surgery in Geriatrics and Frailty*.

Ethics approval and consent to participate: not applicable.

Availability of data and materials: not applicable.

Publisher's note: all claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).