Challenges in the Counseling and Management of Older Kidney Transplant Candidates

Gabriel Danovitch, MD, and Eric Savransky, MD

- Patients aged 60 years and older represent the fastest-growing population with chronic kidney disease and end-stage renal disease (ESRD). In 2002, a total of 137,000 patients aged 65 years and older were on dialysis therapy in the United States, but only a highly selected minority of them (5%) were on the waiting list for a kidney transplant. The majority of older patients on dialysis therapy are not being referred for the waiting list, presumably because of comorbid diseases and lower life expectancy. However, kidney transplantation clearly has been shown to improve survival compared with dialysis, even for older patients. Because both patient age and time on the transplant waiting list increase the risk for death, older patients (ie, ≥60 years) who already have a shorter life expectancy than younger patients are more likely to die with a functioning graft. The limited supply of deceased-donor kidneys and increasing number of patients who would benefit from transplantation have created a dilemma about how to fairly allocate donor kidneys among patients of all ages while meeting the needs of the increasing number of older patients with ESRD. Although older dialysis patients receive fewer kidney transplants than younger patients, their patient and graft survival rates are good. Instead of applying rigid age limits, the “biological,” rather than “chronological,” age of individual patients should be assessed carefully to help clinicians select the most appropriate candidates for kidney transplantation and reduce morbidity and mortality in older transplant recipients. Am J Kidney Dis 47(S2):S86-S97. © 2006 by the National Kidney Foundation, Inc.

INDEX WORDS: Kidney transplantation; end-stage renal disease (ESRD); dialysis; expanded-criteria donor (ECD); standard-criteria donor (SCD); living donor (LD) graft survival; patient survival; older transplant candidates; kidney transplant waiting list.

The incidence and prevalence of end-stage renal disease (ESRD) continue to increase each year.1,2 In the 2004 report from the US Renal Data System (USRDS), 100,359 new patients began therapy for ESRD in 2002, and 431,284 patients with ESRD were under active care.1 Patients aged 60 years and older represent the fastest-growing population with chronic kidney disease and ESRD. In 2002, approximately 137,000 patients aged 65 years and older were on dialysis therapy in the United States.3 The number of older patients registered on the kidney transplant waiting list also has increased substantially.4,5

Between 1994 and 2003, the number of new registrants on the kidney transplant waiting list aged 50 to 64 years doubled, and the number of new registrants older than 64 years more than tripled.6 However, despite these gains, patients aged 65 years and older who were placed on the kidney transplant waiting list represent a highly selected minority of older patients being treated with dialysis (~5%).3,6 Therefore, the majority of older patients on dialysis therapy are not being referred for the waiting list, presumably because of comorbid diseases and lower life expectancy.

Patients with ESRD who receive a kidney transplant have a greater survival rate compared with patients who remain on dialysis therapy.1,2 As of 2002, nearly three fourths of kidney transplant recipients were alive 5 years posttransplantation compared with one third of patients who remained on dialysis therapy.1 This survival advantage has made kidney transplantation the preferred treatment for patients with ESRD.7,8 In addition, kidney transplantation frees patients from the limitations imposed by the need for regular dialysis treatments and improves quality of life. Consequently, greater numbers of patients are being placed on the waiting list for deceased-donor
(DD) kidney transplants, which is increasing the waiting times for all candidates who are registered for a kidney transplant.9

The steadily increasing waiting time to receive a kidney transplant impacts on older patients with ESRD (ie, ≥60 years) more than it does younger patients, who may be healthier and have fewer comorbidities.10 Because risk for death increases with patient age and length of time waiting for a DD kidney transplant, older patients are more likely to die while on the waiting list.

The limited supply of DD kidneys and the increasing number of patients with ESRD who would benefit from kidney transplantation have created a dilemma about the fair allocation of donor kidneys among patients of all ages.10 It also raises the question of who should make the life-changing decision about whether to allocate a DD kidney to a patient or continue a patient on dialysis therapy. If all potential kidney transplant recipients were treated equally, there would be no discrimination based on age, although transplant clinicians likely would prefer to allocate the limited supply of donor kidneys to patients who are most likely to live the longest. However, the steady expansion of the kidney transplant waiting list, particularly because of the influx of older patients and other patients considered to be high risk, has been pressuring the transplant community to develop appropriate and balanced patient selection criteria that will optimize the allocation of scarce donor kidneys.11

**FACTORS THAT CONTRIBUTE TO THE INCREASE IN OLDER KIDNEY TRANSPLANT CANDIDATES**

**The Aging of the US Population**

The proportion of older individuals (≥60 years) in the US population has been expanding continuously12 because of increasing life expectancy, better health care, and a more healthy active older population.10 In the United States, the population aged 65 years and older is expected to more than double from approximately 35 million individuals in 2000 to an estimated 71 million individuals in 2030 (an increase in proportion from 12.4% to 19.6%).13 As a result, the incidences of chronic diseases for which older age is a risk factor (including cardiovascular disease, hypertension, diabetes mellitus, and ESRD) will continue to increase as more patients reach age 60 years and older.10

**The Expanding Kidney Transplant Waiting List**

The kidney transplant waiting list has been expanding by an additional 3,000 to 4,000 patients every year.5 By the end of 2003, the transplant waiting list reached approximately 55,000 candidates (an increase of 7.2% from 2002 to 2003).4 Also, the annual rate of new
patients who register on the waiting list has been increasing each year by 1,000 patients. In 2003, a total of 25,000 new patients registered on the waiting list for a donor kidney. If these growth rates continue, estimates project the number of patients on the kidney transplant waiting list to reach approximately 76,000 to 95,000 registrants by 2010.

Prolonged Waiting Times on the Kidney Transplant List

Expansion of the kidney transplant waiting list has led to increasingly prolonged waiting times for both younger and older patients to receive donor kidneys. In 2003, a total of 43% of registrants on the kidney transplant waiting list had been waiting longer than 2 years for donor kidneys, which represents an increase of 14% since 1994. By the end of 2003, approximately 11% of the registrants had been waiting longer than 5 years. Because patients age while they wait for donor kidneys to become available, the proportion of older registrants on the waiting list also increases.

Aging of Patients on Kidney Transplant Waiting Lists

In 2002, a total of 6,300 patients aged 65 years and older who were being treated with dialysis in the United States were on the US DD waiting list. The absolute number and proportion (ie, percentage) of waiting list registrants aged 50 years and older increased from 1994 to 2003, particularly for those 65 years and older (Fig 1). Since 1994, a greater number of new patients aged 50 years and older have been added to the waiting list each year, whereas the number and proportion of younger new registrants (<50 years) tended to remain stable.

Increased Risk for Death With Patient Age and Length of Time on Waiting List

The death rate for older patients on the kidney transplant waiting list increased between 1994 and 2003. By 2003, the death rate for patients older than 64 years was greater than 100 deaths/1,000 patient-years at risk compared with a rate of approximately 35 deaths/1,000 patient-years at risk for patients aged 18 to 34 years (Fig 2). A
These data support the survival advantage of the earliest possible transplantation of a kidney, whereas a longer wait while on dialysis therapy increases the patient’s risk for death.6

**Survival Advantage of Kidney Transplantation versus Remaining on Dialysis Therapy**

Several studies showed that kidney transplantation is safe and successful and can improve patient survival compared with dialysis, even for older transplant recipients. The first study to show that kidney transplantation was associated with a gain in years of life compared with remaining on dialysis therapy was a longitudinal study conducted by Wolfe et al11 using patients from the USRDS. Kidney transplantation improved life expectancy in all groups of recipients, including those aged 60 to 74 years at the time of transplantation. Annual death rates for patients 60 years and older were 7.4 deaths/100 patient-years at risk for recipients of DD kidney transplants, 10.0 deaths/100 patient-years for patients who were placed on a transplant waiting list while continuing to receive long-term dialysis, and 23.2 deaths/100 patient-years for all patients on long-term dialysis therapy. The annual death rate for all patients on long-term dialysis therapy was 2.6 times the annual death rate for all patients who were placed on the waiting list and continued dialysis therapy, which was 1.7 times greater than the annual death rate for transplant recipients.11

The survival advantage of kidney transplantation compared with remaining on dialysis therapy in patients with ESRD also was shown in an Australian study.15 Two types of analyses were performed: (1) an intent-to-treat analysis and (2) an alternative-survival analysis in which patients who were no longer considered eligible for transplantation (ie, died) were censored at the time of their removal from the waiting list (Fig 3).15 The respective 1-, 3-, and 5-year survival rates were 98%, 95%, and 90% for the transplant group and 92%, 62%, and 27% for the dialysis group (P < 0.01).15

Similar survival benefits for older (≥60 years) kidney transplant recipients versus patients who remained on dialysis therapy were reported by Oniscu et al.16 Overall mortality rates were 10 deaths/100 patient-years at risk for transplant recipients and 16 deaths/100 patient-years for patients who remained on dialysis therapy. Life expectancy was longer (8.17 versus 4.32 years) for all patients

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**Fig 3.** Kaplan-Meier survival estimates for kidney transplant recipients versus patients on the transplant waiting list on dialysis therapy: (A) intent-to-treat analysis and (B) censored on removal from waiting list. *Log-rank test. Adapted with permission from Johnson DW, Herzig K, Purdie D, et al: A comparison of the effects of dialysis and renal transplantation on the survival of older uremic patients. Transplantation 69:794-799, 2000.**

patient older than 64 years who is likely to wait 5 years for a kidney has an approximately 50% chance of dying before a kidney becomes available.5

In addition to patient age, the amount of time on dialysis therapy affects patient risk for death.9 Compared with a control group of patients who were on dialysis therapy for 6 to 12 months, patients on dialysis therapy for less than 6 months had a significantly lower risk for death, whereas patients on dialysis therapy for longer than 12 months had a significantly greater risk for death.9
who received a kidney transplant versus those who remained on dialysis therapy. It appears from these data that kidney transplantation could double the life expectancy of patients older than 60 years.\textsuperscript{16}

Rao et al\textsuperscript{17} analyzed mortality rates in patients 70 years and older from the Organ Procurement and Transplantation Network (OPTN) and the Scientific Registry of Transplant Recipients (SRTR). Transplant recipients had a 39\% lower risk for death compared with patients who remained on dialysis therapy. This survival advantage persisted for both subgroups (aged 70 to 74 and \( \geq 75 \) years) and all comorbidities (diabetes mellitus, glomerulonephritis, and hypertension).\textsuperscript{17}
HOW OLD IS TOO OLD TO RECEIVE A KIDNEY TRANSPLANT?

Older patients (≥65 years) are among the fastest growing group of patients who require kidney transplantation.18 Oniscu et al18 compared graft and patient survival and risks and causes of graft failure among kidney transplant recipients divided into age groups of 18 to 49, 50 to 59, 60 to 64, and 65 years and older. Patients were followed up to 11 years. Older kidney transplant recipients had a greater incidence of death with a functioning graft. Most patients 65 years and older had good graft survival and did not return to dialysis therapy. Although patient survival decreased with age, it was greater for transplant recipients 65 years and older compared with those aged 60 to 64 years (Fig 4A).18 By 5 years posttransplantation, kidney graft survival had decreased only slightly with age. Graft survival for recipients 65 years and older also was greater than for those aged 60 to 64 years (Fig 4B).18

These results indicate that if a kidney transplant recipient did not die, graft function in older transplant recipients was similar to that in younger transplant recipients.18 Therefore, transplantation in older patients is worthwhile despite greater comorbidities. Selection for transplantation by patient characteristics, rather than age limitation, appears to be a more important factor in graft and patient survival.18

EXPANDED-CRITERIA DONOR KIDNEYS FOR OLDER TRANSPLANT CANDIDATES

The term expanded-criteria donor (ECD) refers to kidneys from deceased donors who were either 60 years and older or aged 50 to 59 years with 2 of 3 conditions (terminal serum creatinine level >1.5 mg/dL [>132.6 μmol/L], cerebrovascular accident as cause of death, or history of hypertension).5 Use of ECD kidneys has increased the overall availability of kidney transplantation to patients with ESRD. It also has decreased time on the kidney trans-

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**Fig 4.** (A) Patient survival after kidney transplantation by age group.*

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*Log-rank test.
†There were substantial differences in long-term patient survival between patients younger than 60 years and those 60 years and older up to 5 years posttransplantation. In addition, patients 65 years and older had better survival than patients aged 60 to 64 years up to 5 years posttransplantation. Adapted with permission from Oniscu GC, Brown H, Forsythe JL: How old is too old for transplantation? Am J Transplant 4:2067-2074, 2004.18

(B) Graft survival by patient age group.*

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*Log-rank test.
†There were substantial differences in graft survival between patients younger than 60 years compared with those 60 years and older at 8 years posttransplantation. However, graft survival in patients 65 years and older was similar to that in patients aged 50 to 59 years up to 5 years posttransplantation. Patients 65 years and older had better graft survival compared with those aged 60 to 64 years throughout the study period. Adapted with permission from Oniscu GC, Brown H, Forsythe JL: How old is too old for transplantation? Am J Transplant 4:2067-2074, 2004.18
plant waiting list for patients willing to accept ECD kidneys.9

The annual mortality rate for recipients of ECD kidneys has remained relatively stable over time (100 deaths/1,000 patient-years from 1994 to 2002).9 Although ECD kidney transplantation has better clinical outcomes and lower costs than dialysis, it has worse clinical outcomes and higher costs than with standard-criteria donor (SCD) kidney transplantation.19,20 Therefore, ECD kidneys are offered only to patients who consent in advance to accept them and who understand that ECD kidneys are more likely to fail than SCD kidneys.9,19

Older patients may particularly benefit from ECD kidney transplantation because they have a higher death rate while waiting for an SCD kidney, and longer time on dialysis therapy is more detrimental for older than younger patients.20 To determine whether accepting an ECD kidney is the right choice for an individual patient, the critical issue is how much longer the patient would have to wait before the poorer outcomes and increased costs of waiting on dialysis therapy would outweigh the benefits of receiving a better SCD kidney (ie, the break-even waiting time), which is shorter for older patients.20

A kidney transplant recipient can expect an additional 50% to 100% years of life at any point compared with the life expectancy of a patient remaining on dialysis therapy.16 The report of the 2002 National Conference on the Wait List for Kidney Transplantation21 suggested that patients with ESRD who are most likely to receive optimal benefits from ECD kidneys are:

- Transplant candidates aged ≥60 years
- Transplant candidates with diabetes mellitus who are aged ≥40 years
- Patients being treated with dialysis who have failing or limited options for vascular access
- Patients faring poorly on dialysis therapy (by medical or quality-of-life criteria)
- Unsensitized patients

MODIFIABLE FACTORS THAT PREDICT SURVIVAL IN OLDER KIDNEY TRANSPLANT RECIPIENTS

Because both patient age and time on the transplant waiting list increase the risk for death, older patients who already have a shorter life expectancy than younger patients are more likely to die with a functioning graft. They also have an increased risk for graft loss than younger kidney transplant recipients.7 Factors that affect posttransplantation outcomes in older patients have been poorly defined in the past. Identifying predictors of graft loss and patient mortality would help select older patients (who are more likely to benefit from kidney transplantation), highlight therapeutic issues to be targeted while the patient is waiting for a kidney transplant, and may improve transplant outcomes, thereby optimizing the allocation of scarce donor kidneys. In a study of modifiable factors that predicted graft and patient survival in older (≥60 years) transplant recipients,7 the only factor associated with graft survival was active tobacco smoking at the time of transplantation. Modifiable factors associated with patient survival were active tobacco smoking at the time of transplantation, body mass index, and time on dialysis therapy before transplantation.7

PATIENT MORTALITY BY TYPE OF DONOR

Patient mortality in the early posttransplantation period tends to be high, but it decreases throughout the first year posttransplantation. Mortality is greater with a DD transplant compared with a living donor (LD) transplant, and it also increases with patient age. The lower mortality seen with LD kidney transplants may occur because the surgery is elective, rather than emergent, and the transplant is predictable; thus, the recipient can be fully prepared.22

GRAFT SURVIVAL RATES BY RECIPIENT AGE AND DONOR SOURCE

The number of annual kidney transplants reported to the OPTN/United Network for Organ Sharing (UNOS) registry increased from 8,950 in 1988 to 14,323 in 2003, mostly because of a greater number of LD kidney transplants.23 The number of annual ECD kidney transplants also increased, but the number of SCD
kidney transplants has remained relatively constant. In an analysis of patient data from the OPTN/UNOS registry, older recipient age had no major effect on survival of ECD kidney graft survival up to age 70 years (Figs 5 and 6).\textsuperscript{23} Graft survival rates were lower for older (aged 46 to 70 and >70 years) compared with younger transplant recipients. Although graft survival decreased with time posttransplantation in all age groups, differences in graft survival between age groups were significant only for SCD kidneys (Fig 5).\textsuperscript{23} The smallest difference in graft survival between older and younger age groups in this study were found with LD kidneys (Fig 6).\textsuperscript{23}

**ALLOCATION ALGORITHMS FOR OLDER PATIENTS**

**ECD Program in the United States**

The ECD program currently being used in the United States does not formally define specific characteristics to determine which patients will receive ECD kidneys.\textsuperscript{22} All kidneys now are allocated to patients based only on the time they have been on the waiting list. This allows adequate time to identify and adequately prepare the patient before transplantation and decreases cold ischemia time.

**Eurotransplant Senior Programme**

Organ allocation decisions are complex, and the goal is to achieve a balance between optimal use of all organs (including those from marginal [eg, older] donors) and optimal life expectancy for all potential transplant recipients. Until recently, transplant clinicians believed that organs lose functional capacity with age, organs from older donors would not be suitable for transplantation.\textsuperscript{24} However, it is now known that the chronological age of the donor may not be the sole determinant of the condition of that person’s organs or the success of transplantation, particularly under optimal transplantation conditions.

The Eurotransplant Senior Programme (ESP), which began in 1999, was created to ensure efficient use of kidneys from older donors and increase transplantations in older patients.\textsuperscript{24} Donor organs that are physiologically suboptimal (eg, from older donors) have a greater chance of outliving an older recipient (who has a shorter life expectancy than a younger transplant recipient). However, if a graft outlives the recipient, it is still considered to be a successful transplantation. The ESP is an allocation scheme that matches donors with recipients of the same age group (ie, donors >65 years to recipients >65 years), with the goal of kidney grafts outliving the recipients. HLA matching is disregarded, and kidneys are allocated to local transplant candidates to decrease cold ischemia time as much as possible.\textsuperscript{24}

After 3 years of collecting patient data, the ESP reported that older kidneys were doing well if kidney graft function was not initially delayed immediately posttransplantation.\textsuperscript{24} The 3-year
data also showed no differences in kidney graft survival between recipients of kidneys from older donors (ESP) compared with recipients of donor kidneys obtained through the usual standardized HLA-driven allocation procedures (non-ESP). If care is taken to avoid the accumulation of additional risk factors (eg, longer cold ischemia time, damage to the kidney during surgery, and retransplantation), an allocation scheme using kidneys from older donors for transplantation into older recipients can be successful.\(^\text{24}\)

**KIDNEY TRANSPLANTATION FOR OLDER PATIENTS: A DECISION ANALYSIS**

Initial early-posttransplantation risks for patient and graft survival are high for all kidney transplant recipients, particularly older recipients.\(^\text{25}\) Morbidity, mortality, and costs increase and clinical benefits decrease with patient age and longer waiting times for a kidney transplant. Transplantation is offered less frequently to patients 65 years and older, although the patient survival rate for older patients who receive kidney transplants is favorable. Transplantation in older patients has remained controversial because of the scarcity of donated organs and scientific doubts about the success and cost-effectiveness of transplantation in this age group, despite data that show the survival advantage of transplantation compared with dialysis. Many clinicians continue to view dialysis therapy as a viable strategy with acceptable patient survival and few short-term risks. They also tend to perceive that transplantation has significant risks for morbidity and mortality in older patients.\(^\text{25}\)

Jassal et al\(^\text{25}\) created a decision analysis model to determine the costs and benefits of DD kidney transplantation versus continued hemodialysis therapy for older patients. Both DD and LD kidney transplantation increased overall life expectancy and quality-adjusted life expectancy for kidney transplant recipients of all ages and comorbidities, although with increased costs. As expected, costs associated with kidney transplantation increased with older patient age and/or the presence of comorbidities. Results of this analysis suggest that if a kidney becomes available within a timely period, it may offer substantial clinical benefits to older patients at a more reasonable financial cost. However, prolonged waiting times greatly decreased the clinical and economic benefits of transplantation.\(^\text{25}\)

**LIVING DONATION IN THE ELDERLY**

The percentage of all LD kidney transplantations reported to the UNOS/SRTR has more than
Fig 7. Transplantation from LDs into older recipients, 1994 to 2003.

The percentage of LD kidneys transplanted into recipients older than 50 years increased from 20% to 39%, and the percentage of LD kidneys transplanted into recipients older than 64 years increased from 2% to 8% from 1994 to 2003 (Fig 7). It appears that older recipients of LD kidneys are surviving well beyond their grafts. However, there are limited data for living related donors older than 70 years.

Older recipients of LD kidneys have much greater death rates compared with younger recipients (aged 18 to 34 years). This leads to the following questions about what, if any, limitations there should be to the transplantation of older kidneys from LDs, particularly for older recipients:

- Should there be an upper age limit for LD kidney donation?
- Should the anticipated extra years of life or anticipated improved quality of life for the potential recipients of these kidneys determine any limitations to transplantation?
- Is there a minimum anticipated survival for older kidney grafts or a minimum anticipated life expectancy for older transplant candidates that would limit the use of older LD kidneys?
- Who should determine any limitations to the donation and transplantation of LD kidneys, and on what criteria should the limitations be based?

DILEMMAS FACED BY OLDER TRANSPLANT CANDIDATES

As discussed, there are several treatment options available to patients with ESRD. Transplantation has better treatment outcomes than dialysis therapy, but older patients must compete with healthier younger patients for scarce donated kidneys. Also, prolonged waiting times greatly decrease the clinical and economic benefits of transplantation. The use of ECD kidneys has increased the overall availability of kidney transplantation and decreased time on the kidney transplant waiting list for patients who are willing to accept them. Although ECD kidney transplantation has better clinical outcomes and lower costs than dialysis therapy, it has worse clinical outcomes and higher costs than SCD kidneys.

Schnitzler et al developed a model from USRDS data to help determine when a patient should accept or reject the offer of an ECD kidney to optimize his or her expected quality-adjusted life-years. The model showed that the relatively shorter waiting time for an ECD kidney compared with an SCD kidney decreased costs and improved outcomes for ECD kidney transplant recipients. LD kidney transplantation also may be of particular benefit for older transplant candidates, but an LD may be difficult to find. Questions for older kidney transplant candidates to consider include whether they should:

- Remain on dialysis therapy
- Wait a long time on the list for an SCD kidney to become available
- Register for an ECD kidney and hope for a shorter wait
- Get an LD (either related or nonrelated) kidney transplant as soon as possible

MANAGEMENT OF OLDER KIDNEY TRANSPLANT CANDIDATES

Evaluations of older kidney transplant candidates are complex and costly. The evaluation process should provide adequate information and education so the patient can make informed decisions and take part in his or her care throughout the transplantation process. Older kidney transplant candidates will have to make difficult decisions between receiving a kidney transplant or remaining on dialysis therapy and between waiting for an SCD kidney to become available, accept an ECD kidney, or seek an LD kidney.

The transplant team must consider the best interests of individual patients. It is not easy to
identify the most appropriate older kidney transplant candidates and which type of donor kidney would benefit the patient. In addition, older patients may develop comorbidities that were not present at the time they were first placed on the transplant waiting list, especially if they waited for a prolonged period on dialysis therapy. Comorbid conditions, particularly cardiovascular disease, could have a major impact on their short- and long-term posttransplantation outcomes. Therefore, it might be wise for transplant clinicians to warn older waiting list candidates that even if they are placed on the list, it subsequently may become necessary to remove them from the list if their medical condition deteriorates. This is a painful decision, and transplant clinicians will have to find a compassionate way to present it to patients. Fortunately, the “clock” for waiting time is no longer stopped until the complication that contraindicates transplantation is resolved. Therefore, waiting time is not lost if a patient develops a potentially reversible contraindication to transplantation.

Evaluation of all transplant candidates begins when the patient is referred to the transplant center. Assessment of older transplant candidates includes ruling out significant comorbidities, particularly cardiovascular disease and malignancies. Prophylaxis for infection and anticoagulant therapy may be necessary. Patients who currently smoke tobacco should be counseled to stop smoking immediately.

Psychological and social evaluations are particularly important for older transplant candidates. Social support for transplant recipients can be difficult; therefore, transplant candidates should be encouraged to attend clinic visits with family members and/or friends. The patient’s physical mobility and social support are important issues that will determine how well the patient can be cared for or care for himself or herself posttransplantation. It also is important to determine whether the patient’s expectations about kidney transplantation are realistic; posttransplantation patient care requires a large degree of commitment and adherence to medical care and immunosuppressive and concomitant medications.

Older patients on the kidney transplant waiting list should be reevaluated more frequently than younger patients. The frequency of monitoring and reevaluation depends on the age of the patient and presence or absence of comorbidities. Careful assessment of a patient’s biological, rather than chronological, age should be considered instead of applying rigid age limits. This will allow clinicians to select the most appropriate candidates for kidney transplantation and maximize the benefits to older patients.

**CONCLUSION**

Patients older than 60 years represent the fastest growing population with chronic kidney disease and ESRD. In 2002, a total of 137,000 patients aged 65 years and older were being treated with dialysis in the United States, but only approximately 5% of them were on the kidney transplant waiting list. These patients represent a highly selected minority of older patients with ESRD who are on dialysis therapy. Therefore, the majority of older patients on dialysis therapy are not being referred as candidates for the waiting list, presumably because of comorbid diseases and lower life expectancy. Conversely, a large amount of data provides evidence that: (1) kidney transplantation is both safe and successful, and (2) survival with a kidney graft exceeds survival on dialysis therapy, even among older patients.

Despite the controversy surrounding kidney transplantation for patients 60 years and older, the scarcity of donor kidneys, and doubts about the efficacy and cost-effectiveness of transplantation in this age group, there is a large amount of evidence that age itself should not contraindicate kidney transplantation for older patients. Although patient survival declines with increasing age, graft survival tends to improve. Therefore, overall graft survival for older kidney transplant recipients is similar to that of younger recipients.

The survival advantage of kidney transplantation compared with remaining on dialysis therapy, which tends to increase continuously over time since transplantation, encourages older patients to seek placement on the transplant waiting list. Clinicians should use their best skills and knowledge to select the most appropriate candidates for transplantation, which will maximize benefits for older patients. Graft and patient survival data on transplant recipients aged 50 years and older indicate there should not be an absolute upper age limit at which kidney transplantation is contraindicated. When determining whether kidney transplantation would be beneficial for the patient, assessment of the overall health and life
situation of the individual transplant candidate and the patient’s biological, rather than chronological, age should be deciding factors, rather than applying rigid age limits.

REFERENCES


