

Live Donor Kidney Transplantation-Barriers to Kidney Donation

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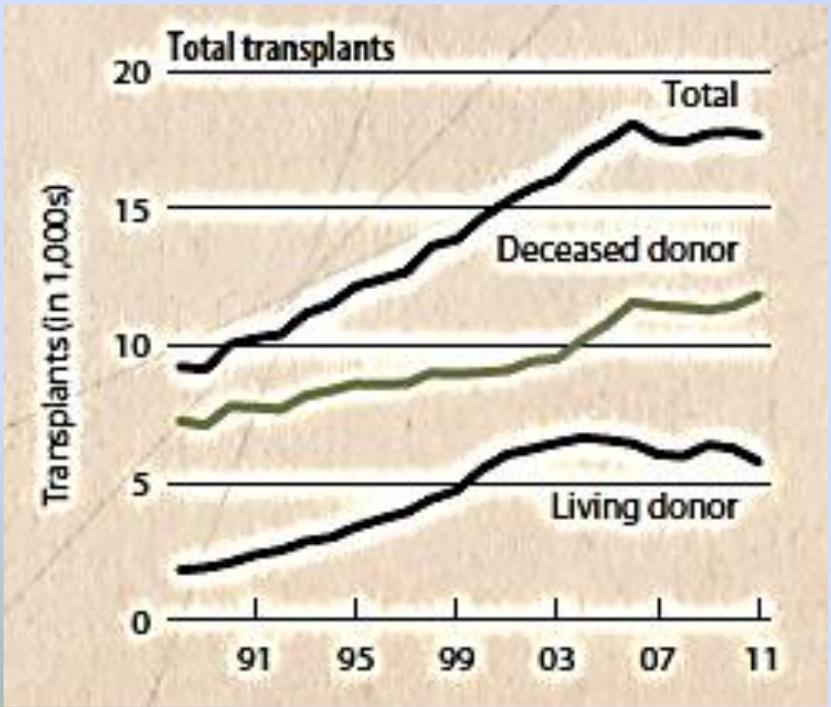
Living Donation-Facts

- The annual number of available deceased donors will not resolve the ongoing shortage of organs
- The survival of a kidney transplanted from a live donor exceeds the results achieved from a deceased donor
- Success of live donor transplantation no longer necessitates the consideration of an HLA match-unless there is possibility of a transplant from HLA identical sibling
- The survival rate of a kidney transplant from a genetically unrelated donor is excellent

Living Donors

- In 1954: Requiring an identical twin for success
- During the 1980's: Selection of an HLA-matched family member
- Current: Any person (irrespective of the HLA match) can be a donor if they are medically and psychosocially suitable
- **It is illegal to buy or sell kidneys or coerce a donor**

EU countries	Actual deceased donors included NHBD (p.m.p.)	TX-including all types of donation (p.m.p.)	Deceased donor TX (p.m.p.)	Living TX (p.m.p.)	NHB kidney TX (p.m.p.)
Austria	196 (23.3)	405 (48.5)	348 (41.4)	59 (7.0)	5 (0.6)
Belgium	221 (20.5)	453 (41.9)	404 (37.7)	49 (4.5)	61 (5.6)
Hungary	159 (15.9)	307 (30.7)	265 (26.5)	42 (4.2)	0
Spain	1502 (32.0)	2225 (47.3)	1985 (42.2)	240 (5.1)	158 (3.4)
Sweden	118 (12.6)	370 (39.4)	202 (21.5)	168 (17.9)	ND
UK	1015 (16.4)	2724 (44.0)	1698 (27.4)	1026 (16.6)	580 (9.4)



- Rules/regulations about donation and number of living donor transplants are different in countries in Europe
- In Germany, living donation is considered a cosmetic operation: costs for the problems arising from donation such as need for hernia operation or even dialysis may not be covered

*U.S. Renal Data System, USRDS
2013 Annual Data Report*

*Heeman U and Renders L. Nephrol
Dial Transplant 2012*

Barriers to Living Donation

- What keeps a patient from attracting a live donor?
- Are barriers recipient, donor or Transplant Center related?
- What role does the Transplant Center play in overcoming barriers?

Recipients-Barriers

- A single center, cross-sectional study of kidney transplant candidates-a single questionnaire administration at the initial transplant evaluation
- Twenty interviews with transplant candidates were performed to understand the barriers to finding live donors that transplant candidates identify

Recipients-Barriers

- Questionnaire-specified whether potential recipients had initiated conversations about donation with any potential donors
- Also measured:
 - Preference for live donor transplantation
 - Knowledge about transplant outcomes
 - Concern about harming the donor
 - Willingness to ask for help in coping with kidney disease; beliefs about dialysis
 - Social support

Recipients-Barriers

- 96 candidates participated; 49 (51%) reported initiating a conversation with at least one potential donor
 - Twenty-one candidates (22%) reported refusing an offer of donation from a potential donor
- Attributes of renal transplant candidates that were associated with initiating a conversation with a potential donor
 - Preference for live donor transplantation
 - Willingness to ask for help
 - **Age and female gender**

Recipients-Barriers

- Older age was associated with a lower odds of initiating a conversation
- Women are less likely to receive live donor transplants-were more likely to seek a live donor
 - Obstacles faced by women are not the result of unwillingness to approach a donor but higher levels of sensitization, donor factors, or the relationships between female candidates and potential donors
- Majority of donors-recruited via personal relationships in their social support network

Willingness to Talk to Others

- 132 patients awaiting kidney transplantation; enrolled in a randomized trial
- Effectiveness of education on rates of live donor kidney transplantation
 - Baseline rating of their willingness to talk to others about living kidney donation
 - Patients completed measures of knowledge and concerns about living donation and a rating of perceived health

Willingness to Talk to Others

- 56% had low willingness to talk to others about living donation
- Higher willingness to talk to others:
 - White race (odds ratio, 3.31)
 - College education (odds ratio, 3.43)
 - Fewer concerns about living donor kidney transplantation (odds ratio, 0.31)
 - Less favorable perceptions of their current health status

Racial Disparities

- SRTR database; 247,707 adults registered for first-time kidney transplants
- Racial disparity in attainment of living donor transplant exists at every transplant center in the US
- Higher percentages of African American candidates at a given center was associated with increased racial disparity at that center *(Hall EC, et al. AJKD 2012)*
- African American race-independently associated with 46% lower odds of achieving LDKTx *(Gore JL, et al. Am J Transplant 2009)*

Racial Disparities-African Americans

- Disproportionate burden of end-stage renal disease (more HTN, diabetes and also obesity)
- Referral to a nephrologist before initiation of chronic dialysis occurs less frequently for blacks than whites (*Prakash S, et al. JASN 2010*)
- Decreased access to the kidney transplant waitlist
- Decreased graft survival after transplant

Recipients-Barriers

- Limited knowledge of the benefits of live donor transplantation
- Concerns about donor harm; guilt about donor's pain
- Cultural, or religious beliefs; racial differences
- Poor ability to cope with chronic kidney disease; denial of their illness
- Lack of social support
- Lower socioeconomic status

Barriers to Receipt of a LDKT, Particularly for Racial Minorities

Interventions That Have or Might Overcome These Barriers

Patient/family level

Patient factors

Variation in mortality/morbidity on dialysis or clinical suitability for transplant

Differing preferences for transplant

Greater fears of transplant surgery or involving a LDKT

Poorer LDKT knowledge

Variation in willingness to ask others to be living donors

Variation in religious views or spirituality about health, organ donation, and transplant

Mistrust of the medical establishment

Practical barriers to transplant: no transportation or ability to take off work for evaluation and recovery

Transient health care coverage or lack of private insurance

Not native English speakers or US citizens

Improved LDKT education in transplant and dialysis centers

Improved preemptive living donor education through community organizations

Interventions to improve patient's health literacy

Interventions to reduce medical mistrust

Community support groups for renal patients in early chronic kidney disease stages

Education addressing how to ask others to be living donors

	Barriers to Receipt of a LDKT, Particularly for Racial Minorities	Interventions That Have or Might Overcome These Barriers
Patient/family level		
Family and social network factors	<p>Lack of eligible living donors because of higher rates of diabetes, hypertension, and kidney disease in families of racial minorities</p> <p>Lack of awareness someone could be a LDKT</p> <p>Higher fears about being a LDKT</p> <p>Mistrust of the medical establishment</p> <p>Practical barriers: no transportation or ability to take off from work for LDKT evaluation and recovery</p> <p>Transient health care coverage or lack of private insurance</p> <p>Not native English speakers or US citizens</p> <p>Cultural differences in family decision making, communication, and support for LDKT</p>	<p>Increased availability of paired donation and nondirected donation programs</p> <p>Improved LDKT education reaching potential living donors on the web</p> <p>Financial assistance covering LDKT-related expenses</p> <p>Transplant education involving the family and prospective donors in multiple languages</p> <p>Media campaigns to educate community about LDKT</p>

Live Donor

- Decision to donate is a complex process-involves medical, psychological, interpersonal, familial and economic factors
- Looking for knowledge and information on the Internet
- Different reasons to donate
- Knowing that graft survival from living donors is better than DD kidneys might be a motivating factor

Reasons to Donate

- Desire to help
- Feeling of increased self-esteem
- Identification with the recipient
- Enjoyment in seeing a relative or friend gain better health
- Culture and religious beliefs
- The detrimental impact that dialysis therapy can have on the lives of recipients and their families

Reasons to Donate

- Experience of external pressure and a sense of moral obligation
- Family expectations and coercion of donors can be evident, especially where the potential donor is declared as the 'best match' by the family
 - Can make it almost impossible for the donor to refuse to donate

Potential Live Donor

- Appropriate for donation from nephrologic standpoint – what is his/her renal risk?
- Healthy enough for surgery?
- Knowledge deficits about living donation
- Competent, willing to donate; free of coercion
- Medically and psychosocially suitable
- Financial concerns and insurance
- Logistic barriers for family members living abroad

Table 1. Percent in each age range of living donors over time (5)

Age Group (years)	1988	1991	1995	2000	2005	2008
18 to 34	46.3	42.2	36.7	32.7	31.1	30.6
35 to 49	39.4	43.5	46.3	47.7	47.2	43.4
50 to 64	12.1	12.6	15.4	18	20.3	24.1
65+	0.7	0.8	1.1	0.9	0.9	1.5

Table 2. Ethnicity of living kidney donors over time as percentage of the living donor population (5)

Ethnicity	1988	1991	1995	2000	2005	2008
African American	11.6	12.2	12.9	12.9	13.3	11.9
Caucasian	76.1	73.8	72.6	70.3	69.1	69.1
Hispanic	9.1	10.5	10.6	11.9	12.9	13.8
Asian	0.3	0.5	1.9	3.3	3.4	3.8
Other	2.9	3	2	1.6	1.3	1.4

- OPTN database
- Median age of donors increased from 35 yo in 1988 to 41 yo in 2008
- The number of living donors age >65 has increased
- Increase in altruistic donors (still a small proportion of all living donors (1.1% in 2005; 1.8% in 2008))

Living Kidney Donors-Obesity

- Transplant programs generally exclude individuals with a BMI > 35 kg/m², and 10% of programs exclude donors with a BMI > 30 kg/m²
 - **19.5% of living donors** reported as having a BMI > 30 kg/m² in 2008
 - 18.1% of white donors, 25.6% of black donors, 22.8% of Hispanic donors, and 10.7% of Asian donors were obese in 2008

Davis CN and Cooper M. CJASN 2010

Mandelbrot DA, et al. Am J Transplant 2007

European Renal Best Practice Guidelines

- 3.5.5. We recommend that the simultaneous presence of more than one risk factor (hypertension, obesity, proteinuria, impaired glucose tolerance, hematuria) precludes donation (**Ungraded Statement**)
- 3.5.8. We suggest well-controlled primary hypertension, as assessed by ambulatory blood pressure <130/85 mmHg, under treatment with maximum two anti-hypertensive drugs (diuretics included) is not considered a contra-indication to living kidney donation (**2C**)
- 3.5.9. We recommend declining hypertensive donors with evidence of target organ damage such as left ventricular hypertrophy, hypertensive retinopathy and micro-albuminuria (**1C**)

European Renal Best Practice Guidelines

- 3.5.11. We suggest a body mass index above 35 kg/m² is a contraindication to donation **(2C)**
- 3.5.12. We recommend counselling obese and overweight donors for weight loss before and after donation. **(Ungraded statement)**
- 3.5.13. We recommend diabetes mellitus is a contraindication to donation, other than in exceptional circumstances **(1D)**
- 3.5.14. We suggest impaired glucose tolerance is not an absolute contraindication to donation **(2C)**

Shifting Paradigms-Systematic Review

- **Older age** (at least up to the age of 70) is no contraindication for living kidney donation
 - Little data are available about live kidney donors aged over 70 years
- **A high BMI**, irrespective of its actual value, should not be considered as an absolute contraindication for living kidney donation
 - Screen each potential obese donor carefully
 - Little evidence available in obese individuals with comorbidities such as hypertension or older age

Shifting Paradigms-Systematic Review

- **Hypertension** (blood pressure >140/90 mm Hg) should remain a relative contraindication for live kidney donation
- **Vascular anomalies** (in particular up to 3 renal arteries) should not be a contraindication for live kidney donation
- **Minors** (aged <18 years) should not be considered as kidney donors, except in rare cases where no other options are available for the recipient

Donors-Insurance Issues

- Approximately 18% of live donors lack health insurance at the time of donation in the US
- More prevalent in donors who belong to minority racial groups, who are at higher risk of postdonation hypertension and ESRD than Caucasian donors

Leichtman A, et al. Am J Transplant 2011

Davis CL and Cooper M. CJASN 2010

Boyarsky BJ, et al. Am J Transplant 2014

Donors-Insurance Issues

- Under the Patient Protection and Affordable Care Act (ACA), discrimination in the provision of health insurance based on preexisting conditions became illegal on January 1, 2014
- Insurance companies can no longer refuse health insurance to live kidney donors, or charge them a higher insurance rate
- The ACA does not affect life insurance

Donors-Insurance Issues

- Retrospective survey of 1046 live kidney donors up to 40 years since donation
- Donors who experienced difficulty with insurability after donation:
 - 7.0% of participants who attempted to change or initiate health insurance
 - 25% of participants who attempted to change or initiate life insurance
 - Males and donors above age 40 were more likely to report having had difficulty

Donor Issues

- Education of potential donors and public
- Concerns of coercion-evaluation by separate donor team
- Accuracy of health assessment
- Higher rates of hypertension, diabetes, and obesity in the African American population
- Lack of insurance/reimbursement of living donation expenses for eligible donors
- Postdonation medical care and follow-up

Transplant Center Effect

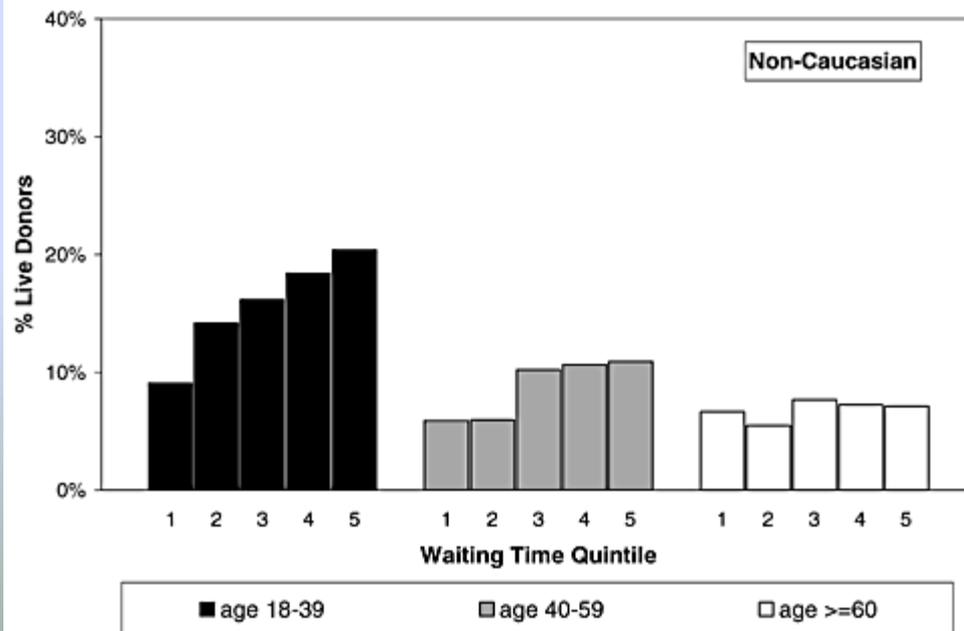
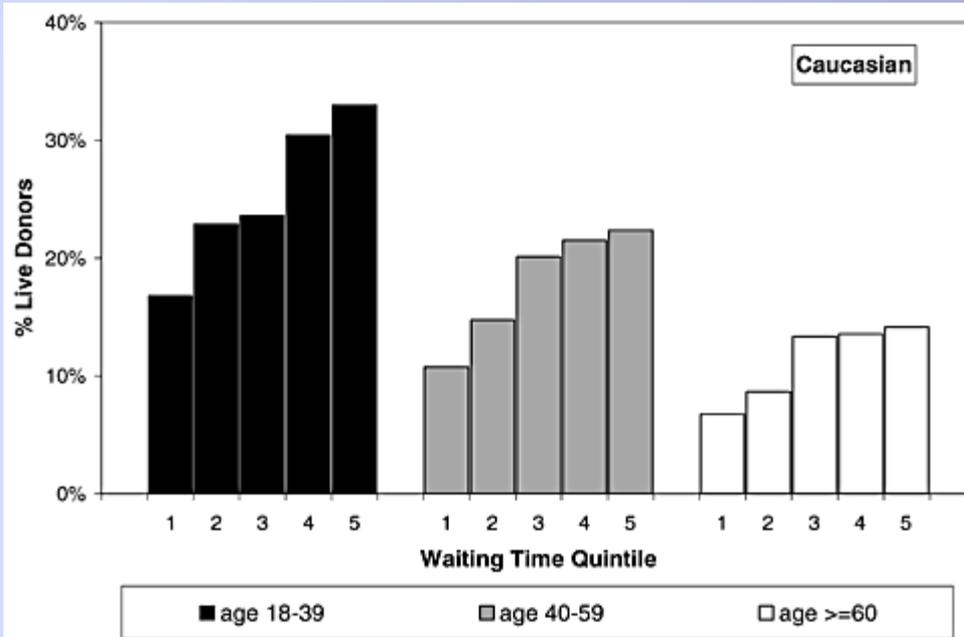
- Primary cohort: 148,168 individuals at 194 US centers-registry data; 34,593 (23.3%) underwent LDKTx within 1.5 years
- Lower likelihood of LDKTx:
 - Older age
 - Black race
 - Diabetes
 - Elevated PRA
 - Type O blood
 - Lower education
 - Non-private health insurance

Transplant Center Effect

- Center use of **unrelated live donors** and the presence of a **biological incompatibility program**-associated with greater odds of getting a live donor transplant
- Centers with greater use of **unrelated live donors**, with a **biological incompatibility program**, and **laparoscopic nephrectomy** were less likely to lag behind other centers

Characteristic	OR	95% Confidence interval	p-value
Use of non-family donors, per higher tertile *	8.30	(3.71, 18.57)	<0.01
Use of donor exchange or ABO incompatible transplant	4.79	(1.66, 13.79)	<0.01
Use of laparoscopic nephrectomy, per higher tertile *	2.53	(1.19, 5.38)	0.02
Center volume of transplants, per higher tertile *	1.39	(0.77, 2.50)	0.28
Higher Market competition	1.24	(0.43, 3.61)	0.70

- Higher education and private insurance were associated with greater individual access to LDKTx



- Candidates at transplant centers with longer waiting times were more likely to receive LDkTx after listing (2 fold higher odds)
- Non-Caucasians had lower rates of LDkTx when compared to Caucasians
- Increased search for live donors

Transplant Centers-To Do

- Providing information that is easily understood by individuals with limited literacy; raising awareness
- Designated staff with greater personal interest in working with live donors
- Donor exchange, blood group incompatible transplant, and desensitization programs
- Accepting the unrelated donors
- Accepting “medically complex live donors”-troubling

Barriers to Receipt of a LDKT, Particularly for Racial Minorities

Interventions That Have or Might Overcome These Barriers

Provider factors		
<p>Physician and/or health care provider factors</p>	<p>Lack of physicians and health care providers who are racial minorities</p> <p>Physician beliefs about racial differences in morbidity and mortality with transplant versus dialysis</p> <p>Perceptions of patients' suitability for transplant—subconscious stereotyping</p> <p>Insufficient training in transplant (for dialysis providers)</p>	<p>Establish a diverse and culturally competent health care workforce</p> <p>Establish practice guidelines for transplant eligibility and referral</p> <p>Train dialysis providers how to educate patients about LDKT</p>
<p>Physician-patient factors</p>	<p>Patient confusion about LDKT owing to inconsistent transplant education and referral across multiple providers</p> <p>Less established or quality patient-physician relationship</p> <p>Poor patient-physician communication regarding LDKT</p> <p>Cultural or language barriers between patients and physicians</p>	<p>Develop culturally competent education at appropriate literacy levels in multiple languages</p> <p>Increase the availability of interpreters</p> <p>Strengthen communication between transplant, dialysis, and community physicians</p>

TALK STUDY

- Talking About Live Kidney Donation (TALK) Study; randomized controlled trial of the effectiveness of educational and social worker in preemptive living donor kidney-in Baltimore, US-130 patients
- (1) Usual care (routine care with their nephrologists), (2) TALK education intervention (video and booklet), or (3) TALK social worker intervention (video and booklet plus patient and family social worker visits)

Boulware L, et al. AJKD 2013

	Usual Care (n=44)	TALK Education (n=43)	TALK Social Worker (n=43)	p-value
Prior Information about Living Kidney Donor Tx				
Received prior information (Yes)	15 (34)	14 (33)	14 (33)	0.9
Perceived adequacy of information				0.5
Not well informed	13 (30)	17 (40)	19 (44)	
Slightly well informed	12 (27)	7 (16)	12 (28)	
Moderately well informed	15 (34)	12 (28)	8 (19)	
Very well or extremely well informed	3 (7)	7 (16)	4 (9)	
Not reported	1 (2)	0 (0)	0 (0)	
Length and intensity of relationship with nephrologist				
Years seeing current nephrologist	2.5 [1-6]	2.5 [2-5]	2.5 [1-5]	0.3

Boulware L, et al. AJKD 2013

TALK Study

- Outcomes through a questionnaire at 1-, 3-, and 6-months follow-up
- TALK educational and social worker interventions helped patients discuss and actively pursue pre-emptive LKTx
- Participants' interest in LKT was high at baseline and remained high over follow up
 - Most concerned about how LKTx might affect donors' safety, money matters, feelings of guilt or coercion, and recipients' safety or feelings of guilt

New Strategies in Living Donation

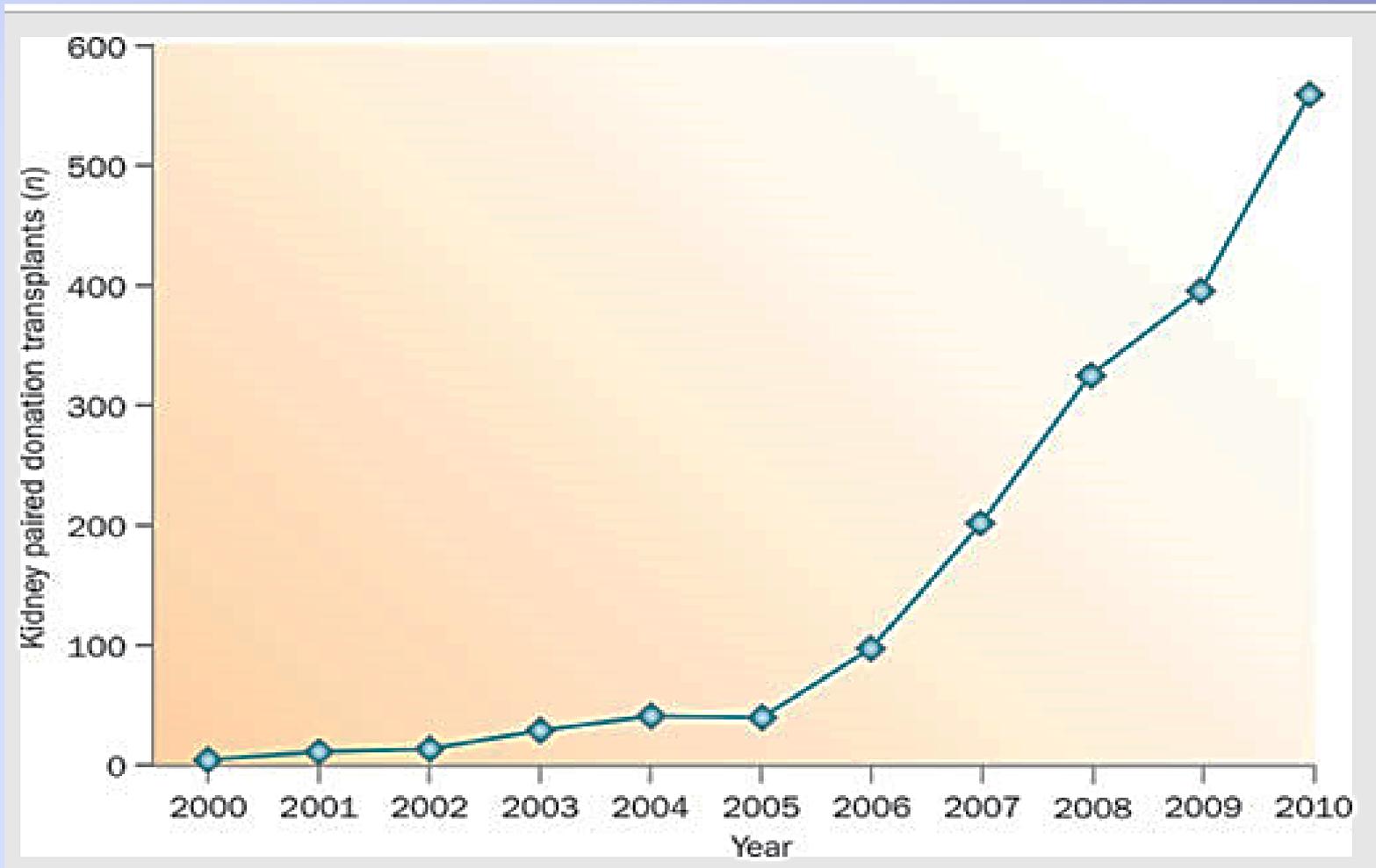
- New techniques: Hand-assisted laparoscopic donor nephrectomy; single-port nephrectomy and transvaginal extraction of the kidney
- Programs using desensitization and transplantation across the blood-type barrier; new complement inhibitor drugs such as eculizumab
- Older living donors for older recipients

New Strategies in Living Donation

- Paired kidney exchange (PKE)-in patients who are incompatible with their healthy, willing live donors: increased since 2006 **but** makes up only 1% of transplants performed in the US
- Use of altruistic (nondirected) donation
- Altruistic donor chains (domino paired donations)

Paired Kidney Exchange

- To obtain compatible donor transplants for two or more recipients with immunologically incompatible potential live kidney donors by exchanging donors
- 2-way exchange or 3-way exchange-using a computer program-usually performed simultaneously
- PKE programs now operate in the Netherlands, Canada, Israel, South Korea, Romania, the United Kingdom, US and Australia
- Most single centers are unable to enroll enough pairs for efficient exchange on a permanent basis, and collaboration with other centers is essential



- Significant growth of kidney paired donation in the US-from OPTN
- Shipping of living donor kidneys to reduce geographic barriers; participation of compatible pairs to increase match opportunities; and using altruistic donors

Paired Kidney Exchange

- Legal framework to allow the development of national programs for both nondirected donation and paired donation
- Allocation algorithm for matching
- Mandatory medical suitability criteria
- Listing in the deceased donor waiting list
- Donor travel versus shipping of organs

Barriers to Receipt of a LDKT, Particularly for Racial Minorities

Interventions That Have or Might Overcome These Barriers

<p>System level</p> <p>Health care organization factors</p>	<p>Insufficient time for potential donor and recipient education about LDKT</p> <p>Complex and inefficient transplant evaluation</p> <p>Lack of LDKT educational resources in multiple languages and for low health literacy patients</p> <p>Healthy potential living donors do not match their recipients</p>	<p>Streamline transplant and living donor evaluation and surgery</p> <p>Chronic Care Model or guided-care approach to help ensure patients complete transplant evaluation</p> <p>Establish standard LDKT educational programs using web, video, and print materials</p> <p>Establish national paired donation program</p>
<p>Community and societal level</p>	<p>Lack of health insurance results in delayed access to CKD care—minorities present to emergency rooms in ESRD</p> <p>Providers receive more reimbursement for dialysis care than transplant referral</p> <p>Costs of immunosuppressant drugs after 3 years stop minorities from pursuing LDKT</p>	<p>Universal access to health care</p> <p>Provide incentives for appropriate referrals (ie, pay for performance)</p> <p>Proposals to extend Medicare immunosuppressant drug coverage for the life of the transplant</p>

Summary

- Improving education for patients, donors, and providers
 - Increase awareness of live donation for racial/ethnic minorities
 - Culturally tailored education
- Using live donor kidneys more efficiently
- Reducing surgical and financial barriers to transplant; using new techniques
- Clarifying transplant-eligibility guidelines
- Better partnerships between community providers and transplant centers
- Media campaigns and community outreach