The Right Kidney for the Right Recipient

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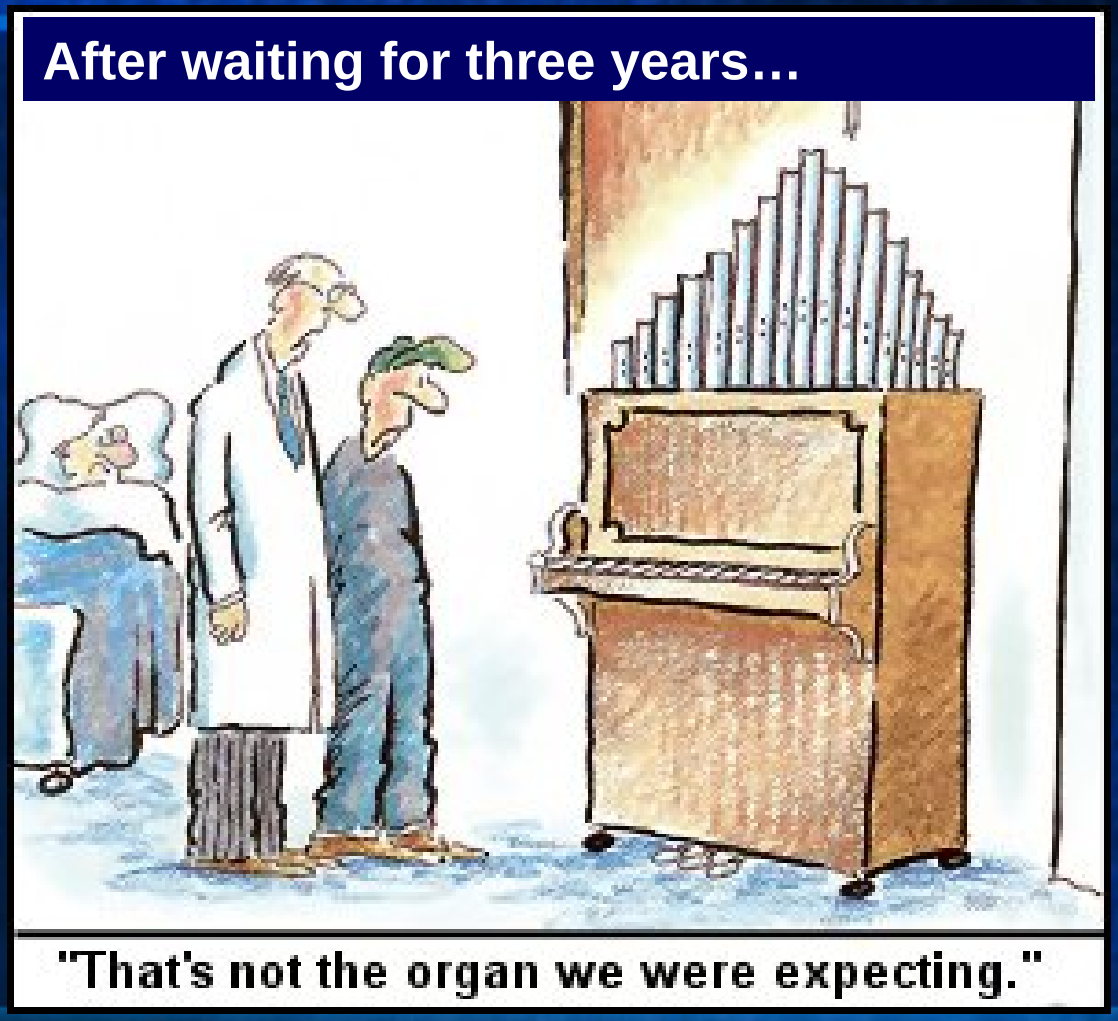
The University Hospitals of Columbia and Cornell

There’s No Perfect Organ!



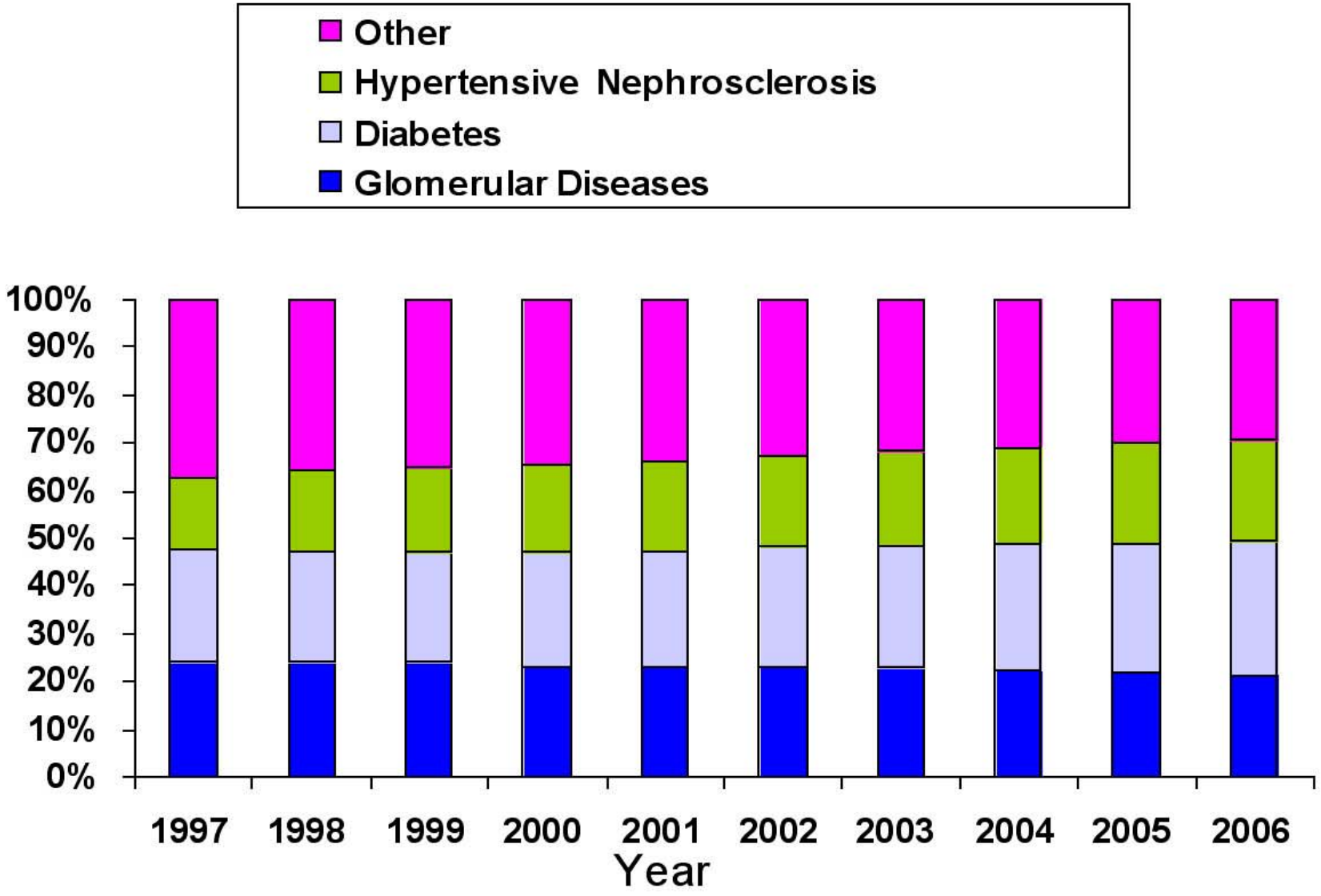
Pre-owned or Used?

The Good of the many…

Life Years From Transplant (LYFT)

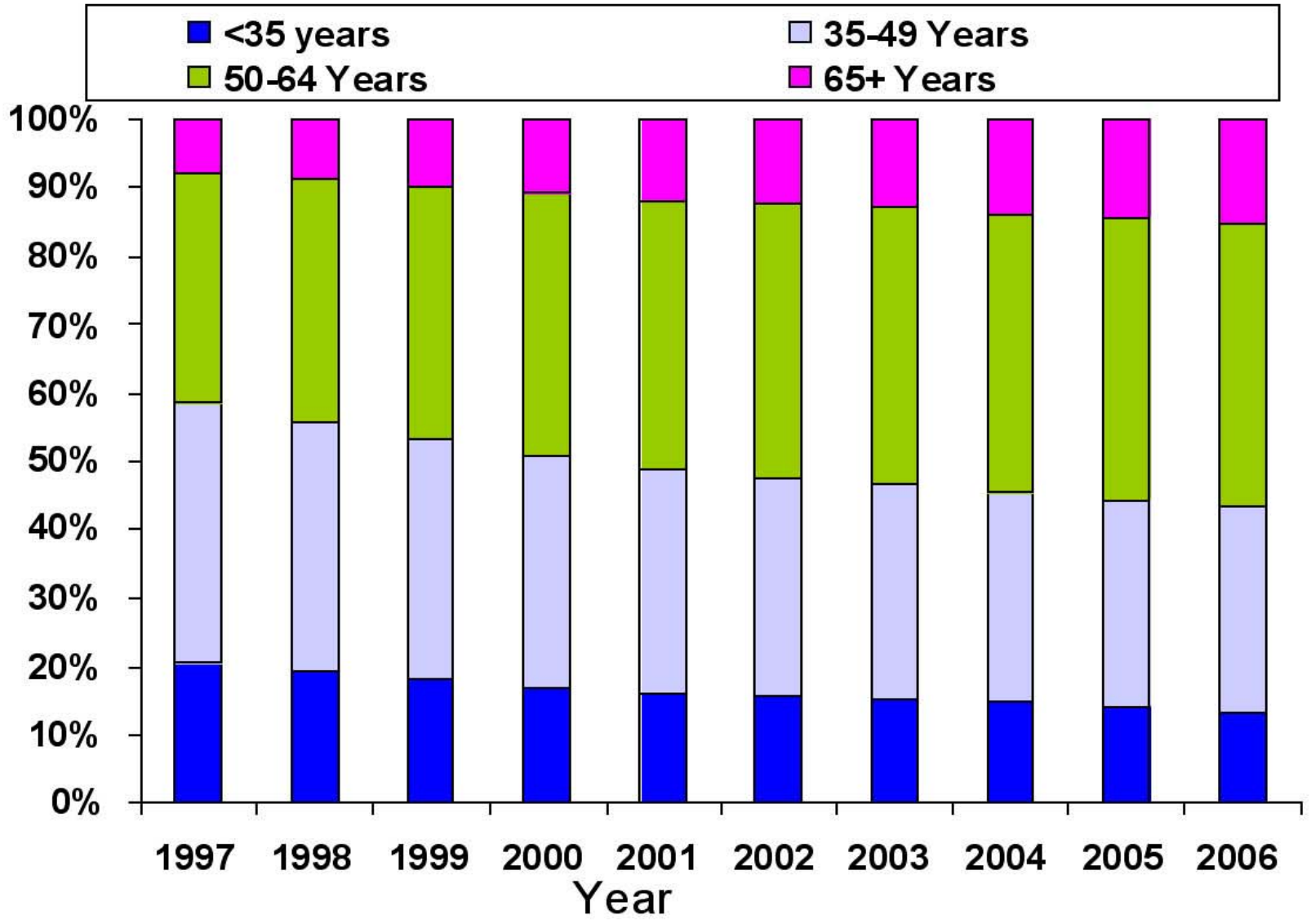
- The predicted extra remaining years of life that a candidate could expect with a transplant compared to without a transplant.
- The calculation is based on estimated the remaining lifetimes with and without transplant, specific to the characteristics of a candidate and donor organ.

Primary Diagnosis of Active Kidney Waiting List Patients at Year -End, 1997 -2006



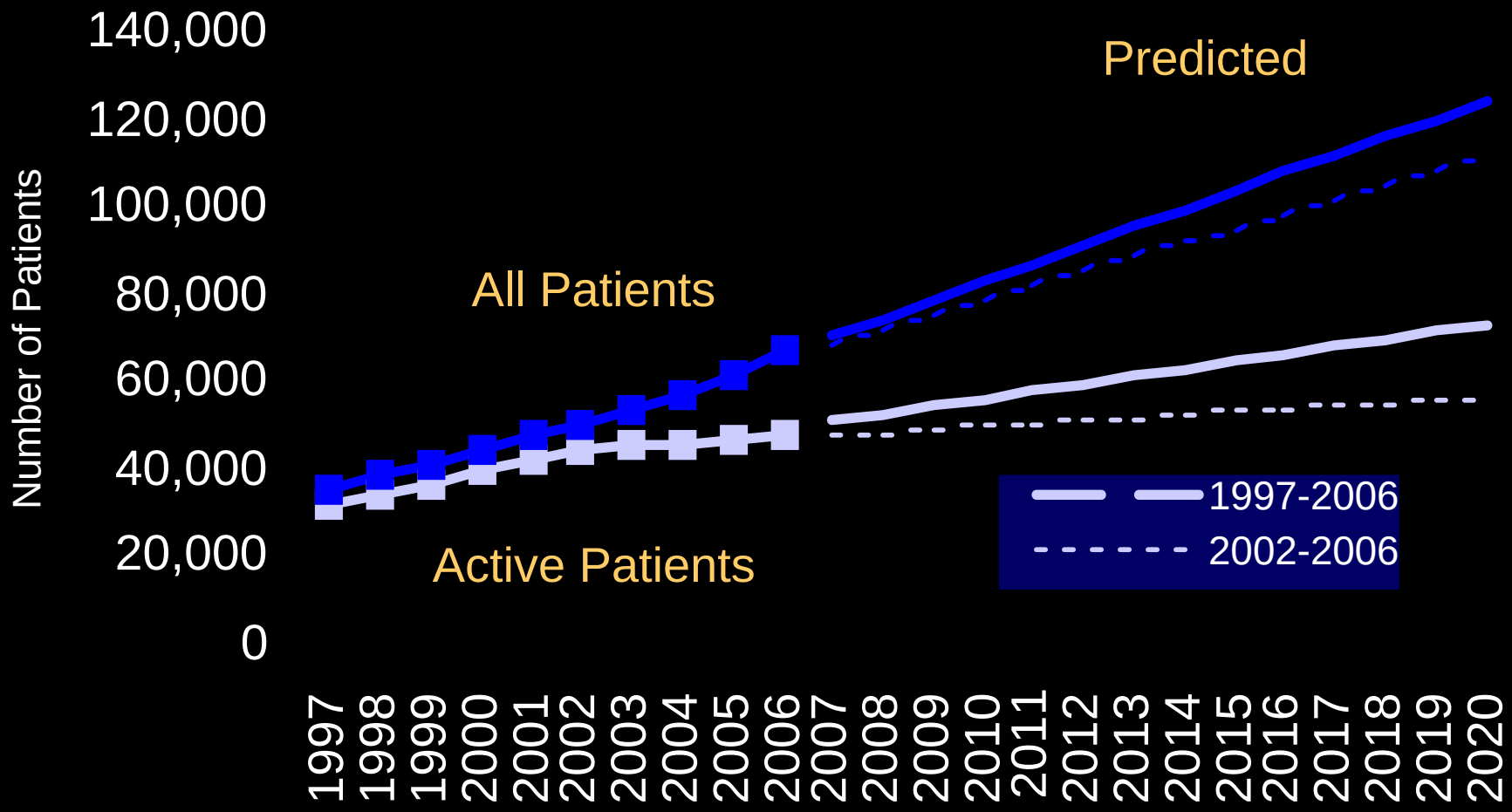
Source: *2007 DRAFT OPTN/SRTR Annual Report,* Table 5.1a.

Age of Active Kidney Waiting List Patients at Year -End, 1997 -2006



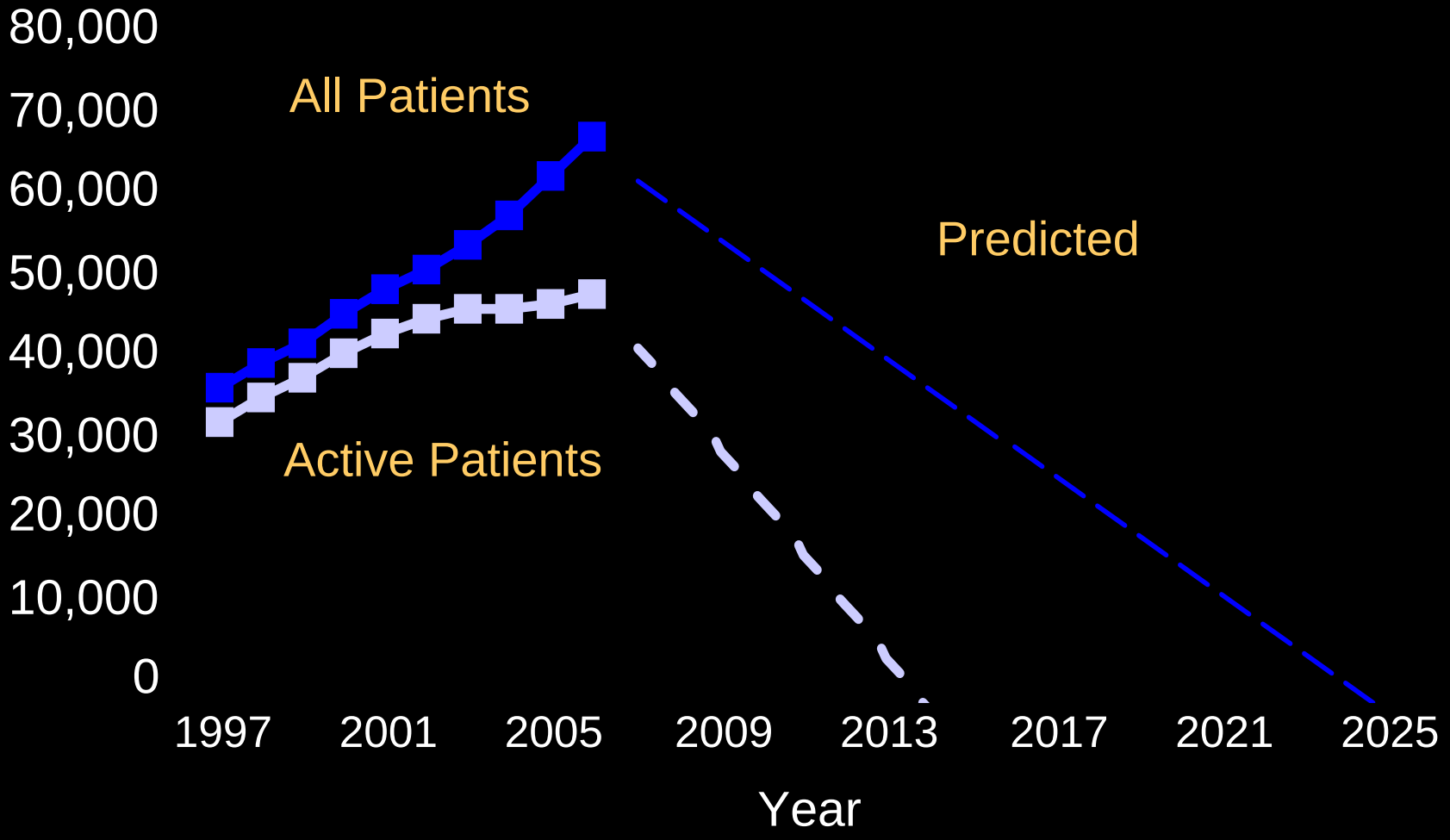
Source: *2007 DRAFT OPTN/SRTR Annual Report,* Table 5.1a.

Projected Growth in the Total and Active Waiting List for Deceased Donor Kidneys



Source: *2007 OPTN/SRTR Annual Report,* Tables 1.3 and 5.1. Predicted values for 2007-2020 based on slope of the line from 1997-2006 and 2002-2006 and assumes current rates of waitlisting and transplantation.

Projected Growth in the Waiting List for Deceased Donor Kidneys, 1997-2013: with prediction of 7,000 incremental transplants per year

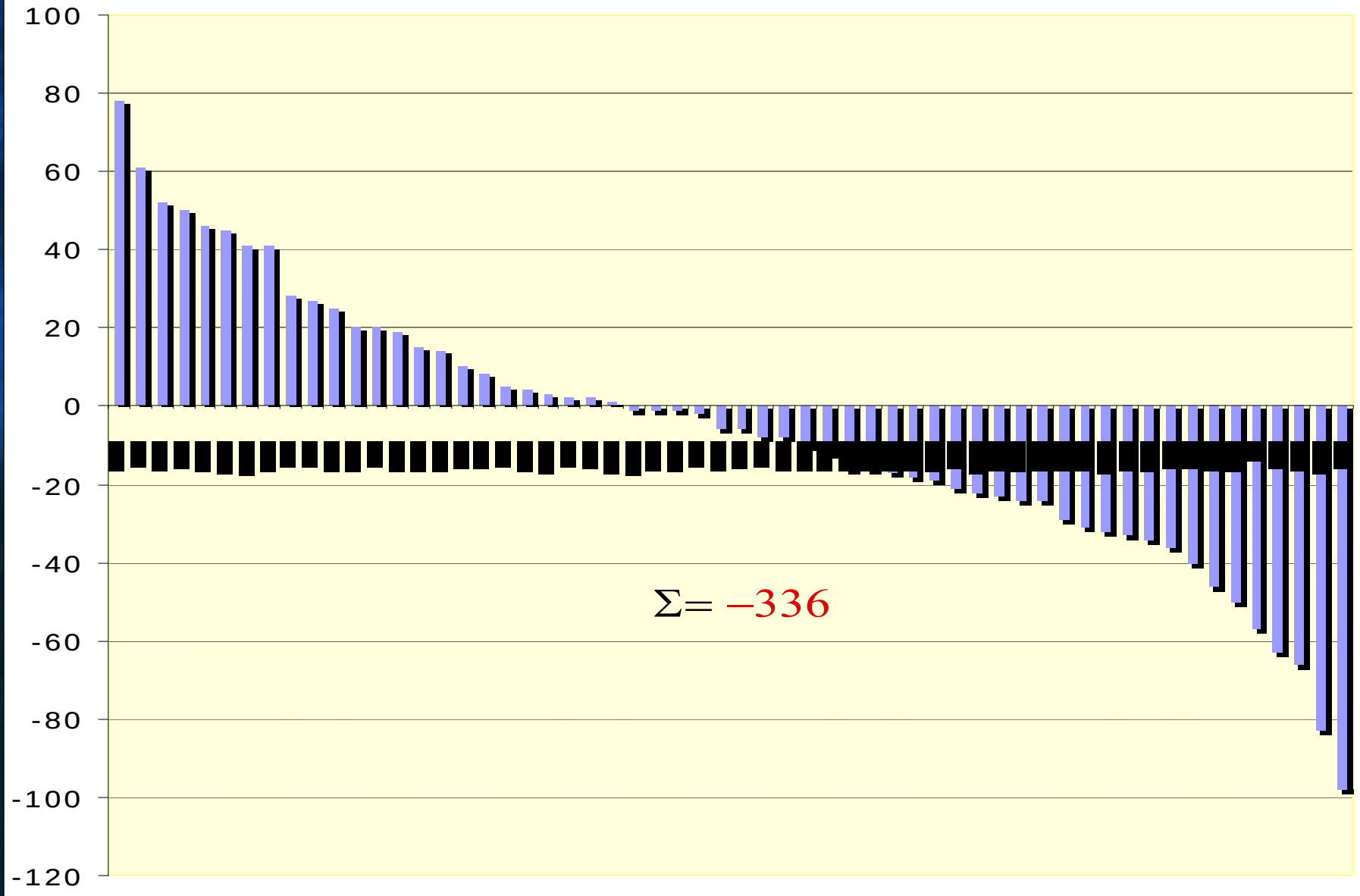


Source: *2007 OPTN/SRTR Annual Report,* Table 5.1. Predicted values for 2007-2013 based on slope of the line from 2002-2006.

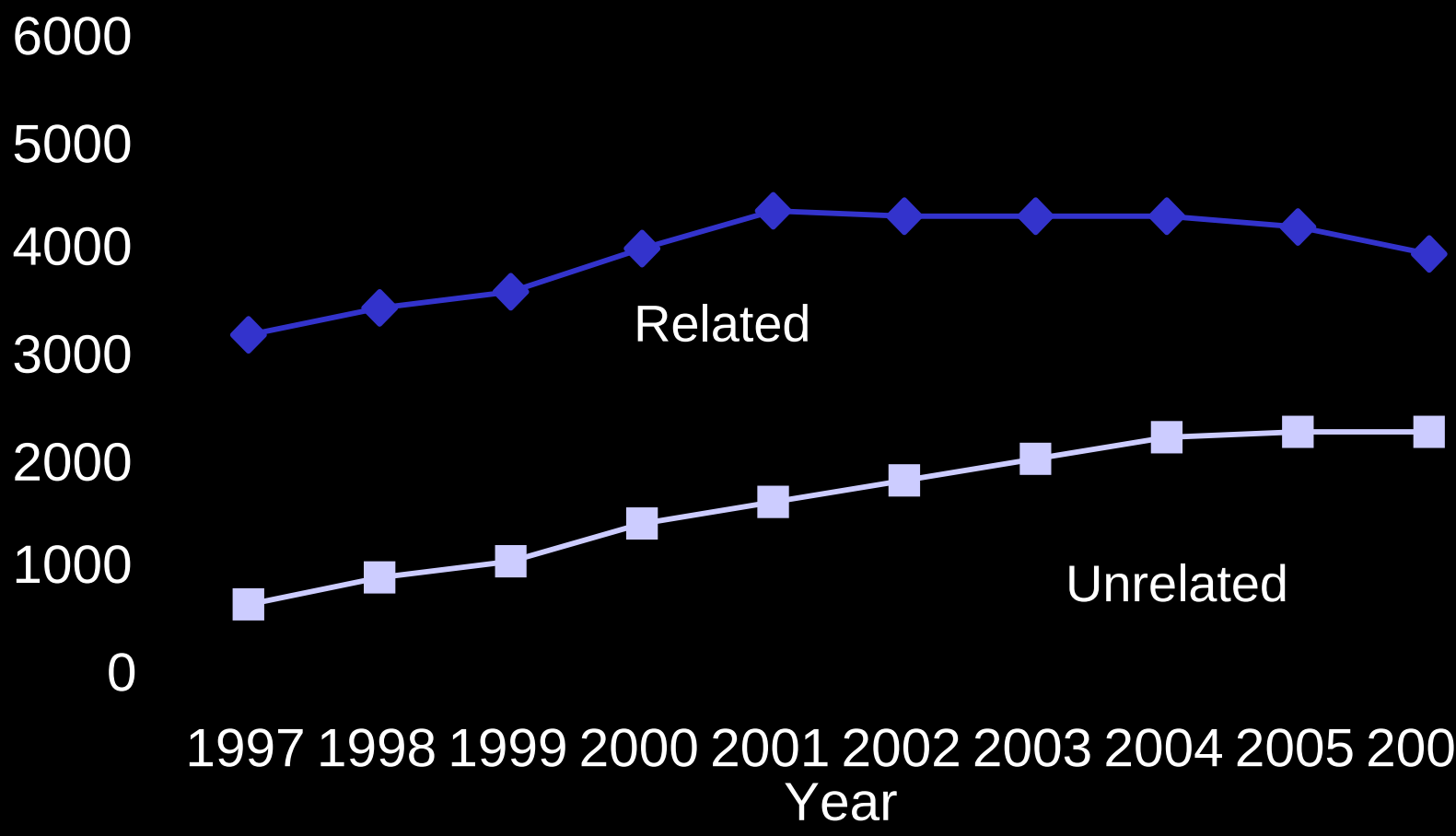
The 7000 Plan per DSA "Allograft Opportunity"

- 1 standard criteria deceased donor (2 kidneys)
- 1 expanded criteria deceased donor (2 kidneys)
- 1 deceased cardiac donor (2 kidneys)
- 1 living related donor (1 kidney)
- 1 living unrelated donor (1 kidney)
- 1 paired donation (2 kidneys)
- 1 intended candidate donation (1 kidneys)
- 1 desensitization protocols for a potential living donor recipient (1 kidney)
- 1 desensitization protocols for a potential deceased donor recipient (1 kidney)
- 1 en bloc or dual kidney transplant (1 kidney transplant)
- 1 Hepatitis C antibody or Hepatitis B Core antibody positive donor (2 kidneys).

Net Change in Kidneys Transplanted by DSA 2007-2008

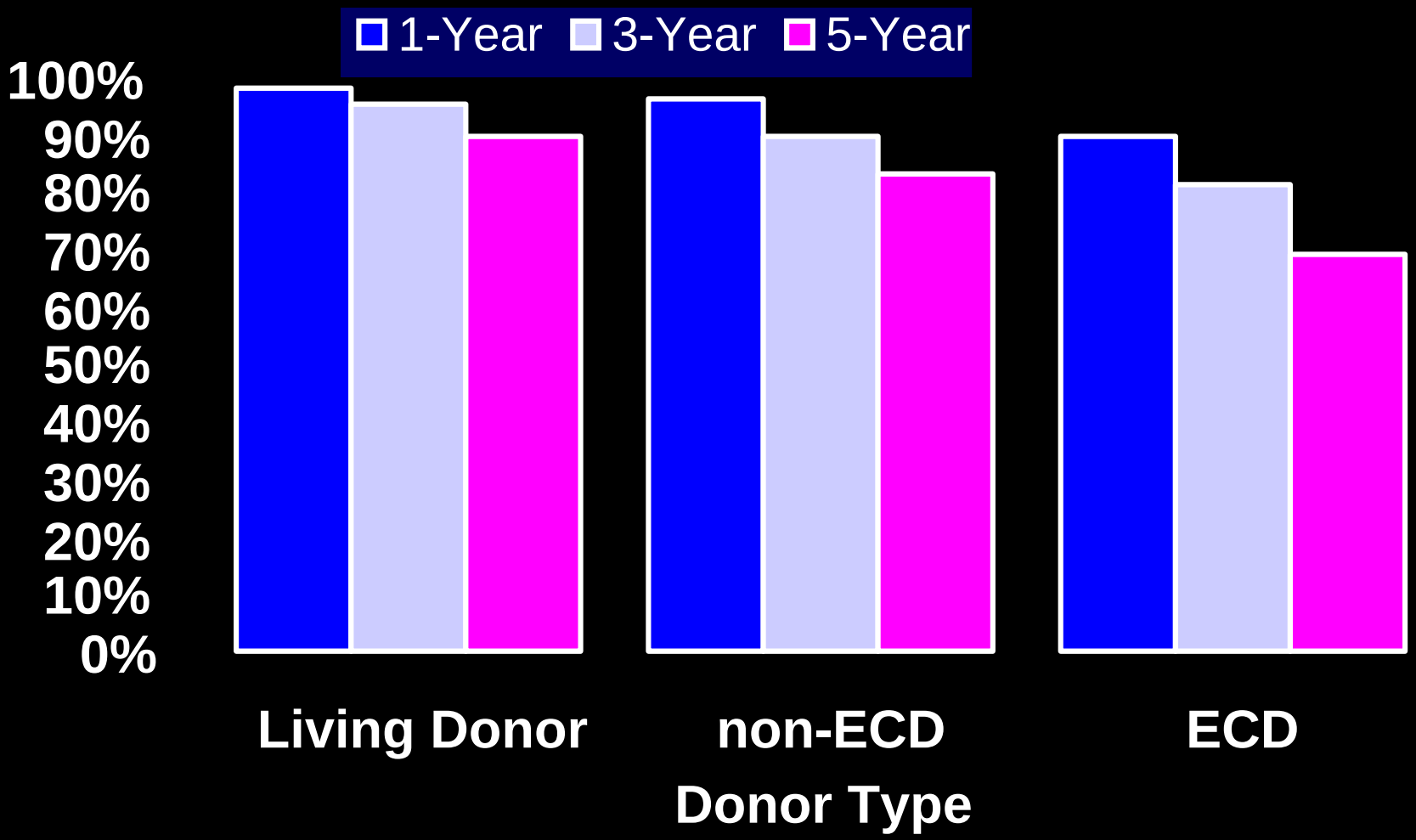


Trends in Living Related and Living Unrelated Donors, 1997-2006



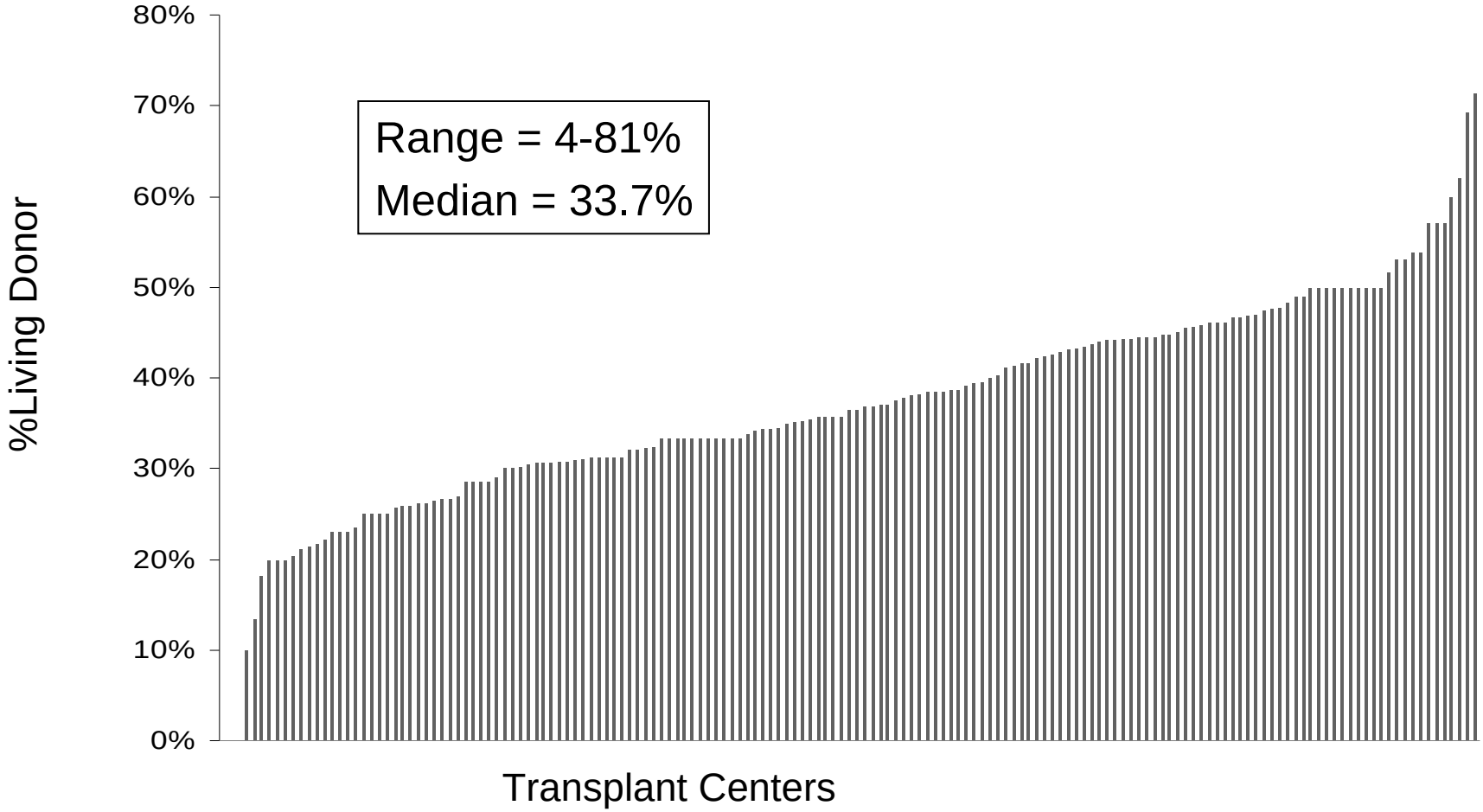
Source: *2007 DRAFT OPTN/SRTR Annual Report,* Table 5.4c

Unadjusted 1-Year, 3-Year, and 5-Year Kidney Recipient Survival, by Donor Type: 2000-2005



Source: *2007 DRAFT OPTN/SRTR Annual Report,* Tables 5.14a, b, c.

Percent Living Donor Kidney Transplants by Transplant Center*, 2006



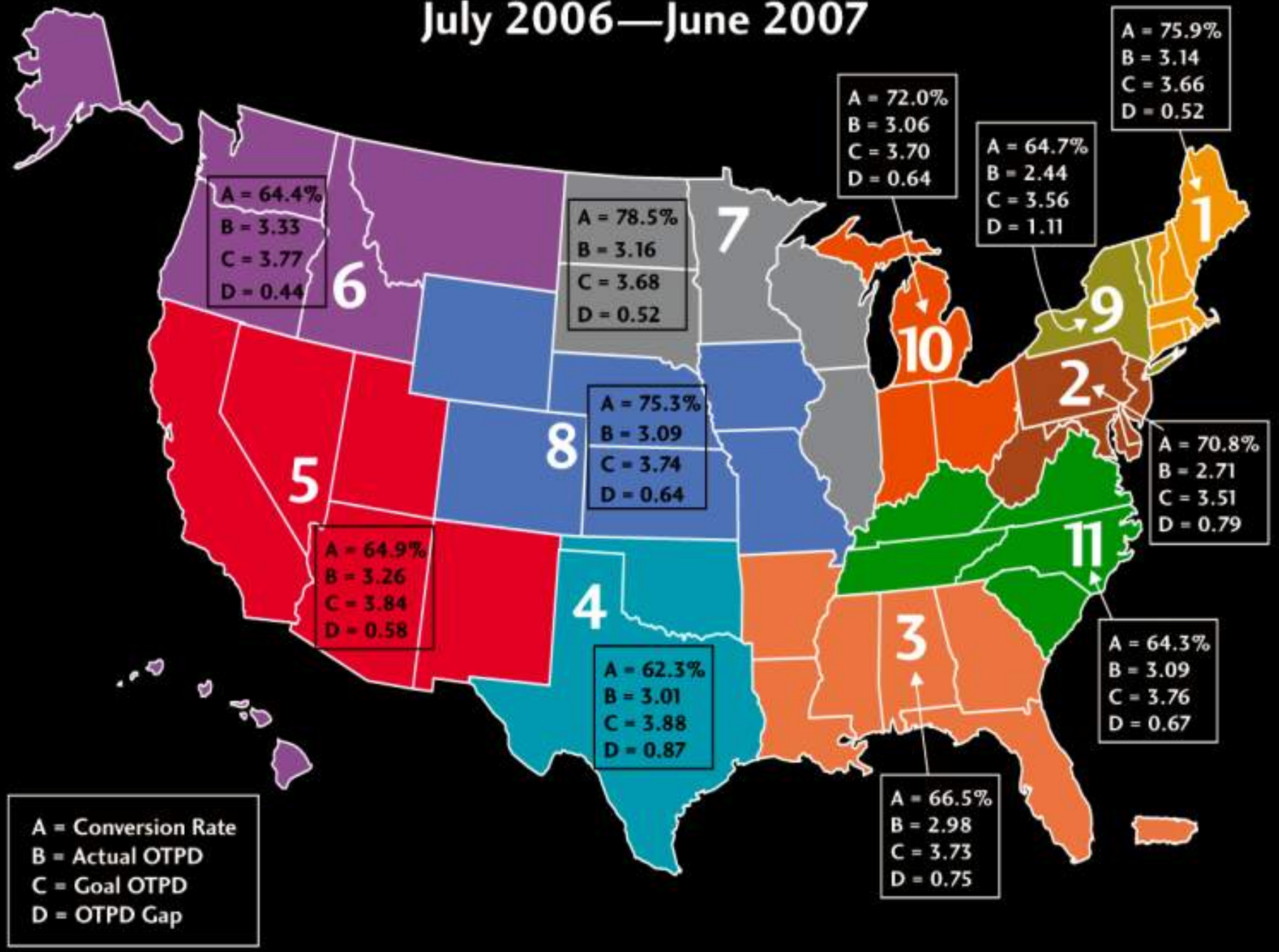
***Among centers with >20 transplants**

Source: Special Analysis

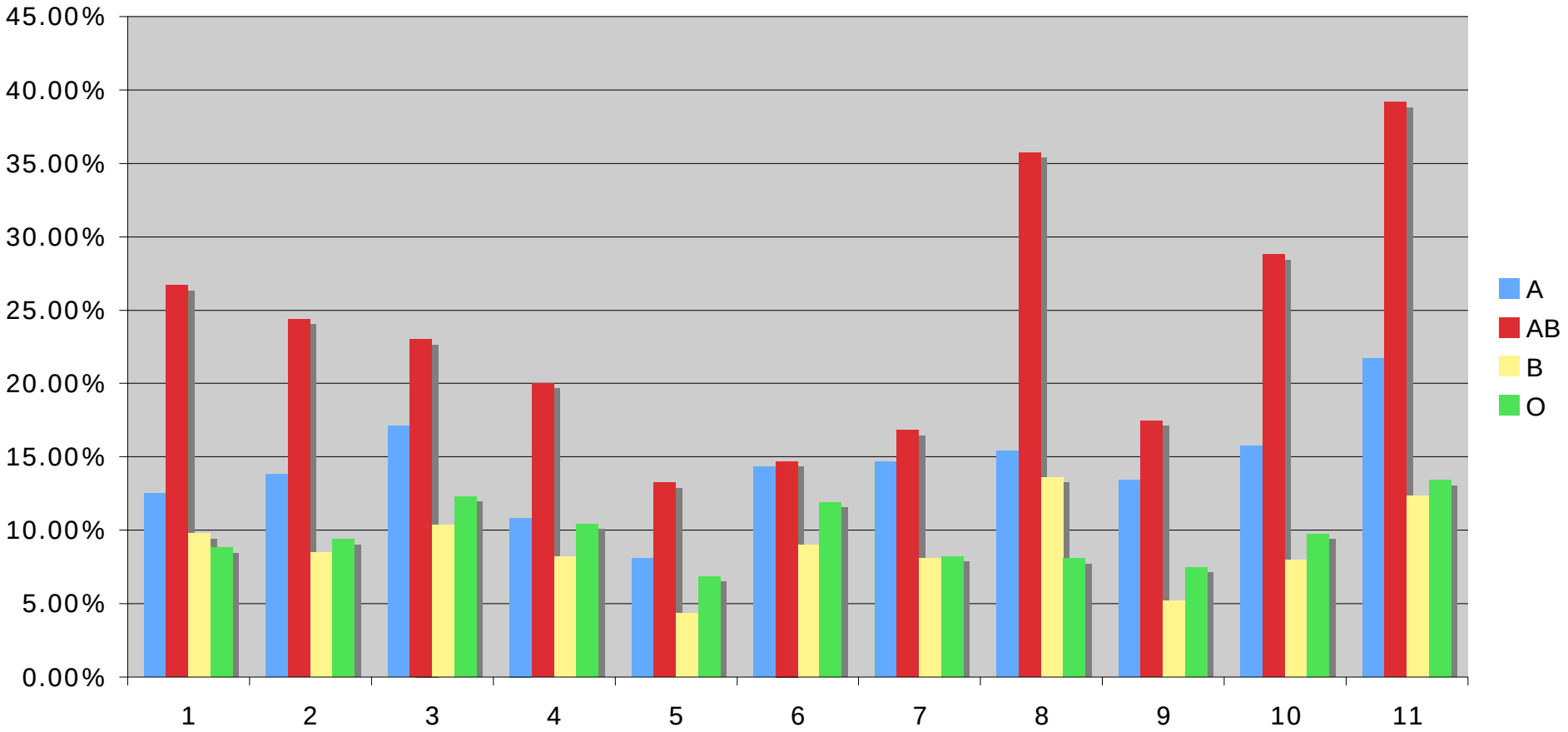
WANTED

Standard
Criteria
Deceased
Donor

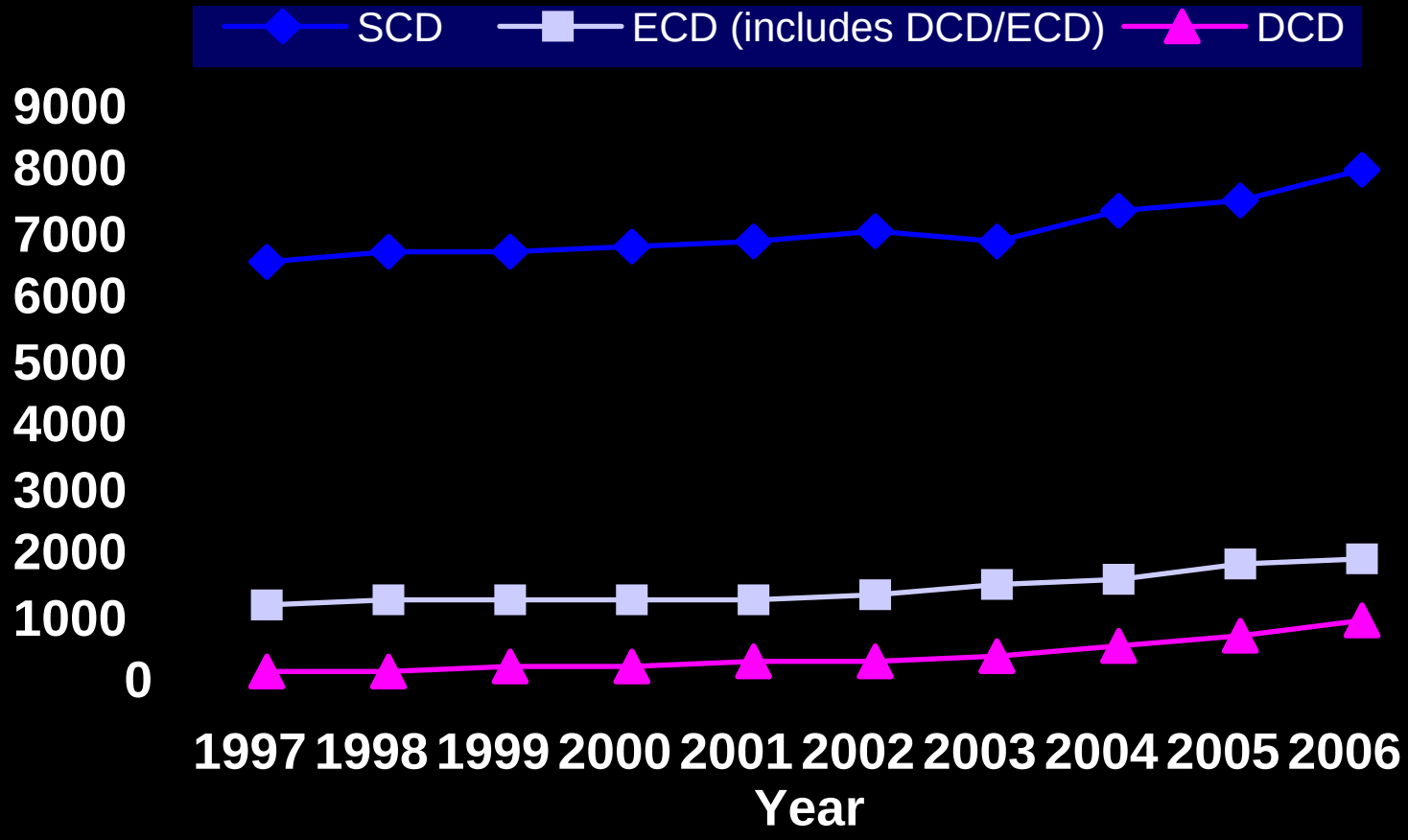
REWARD


July 2006—June 2007
A = 75.9%
B = 3.14
C = 3.66
D = 0.52
A = 72.0%
B = 3.06
C = 3.70
D = 0.64
A = 64.7%
B = 2.44
C = 3.56
D = 1.11
A = 64.4%
B = 3.33
C = 3.77
D = 0.44
A = 78.5%
B = 3.16
C = 3.68
D = 0.52
A = 75.3%
B = 3.09
C = 3.74
D = 0.64
A = 70.8%
B = 2.71
C = 3.51
D = 0.79
A = 64.9%
B = 3.26
C = 3.84
D = 0.58
A = 62.3%
B = 3.01
C = 3.88
D = 0.87
A = 64.3%
B = 3.09
C = 3.76
D = 0.67
A = 66.5%
B = 2.98
C = 3.73
D = 0.75
1
2
3
4
5
6
7
8
9
10
11
A = Conversion Rate
B = Actual OTPD
C = Goal OTPD
D = OTPD Gap

Kidney-Probability of Transplant



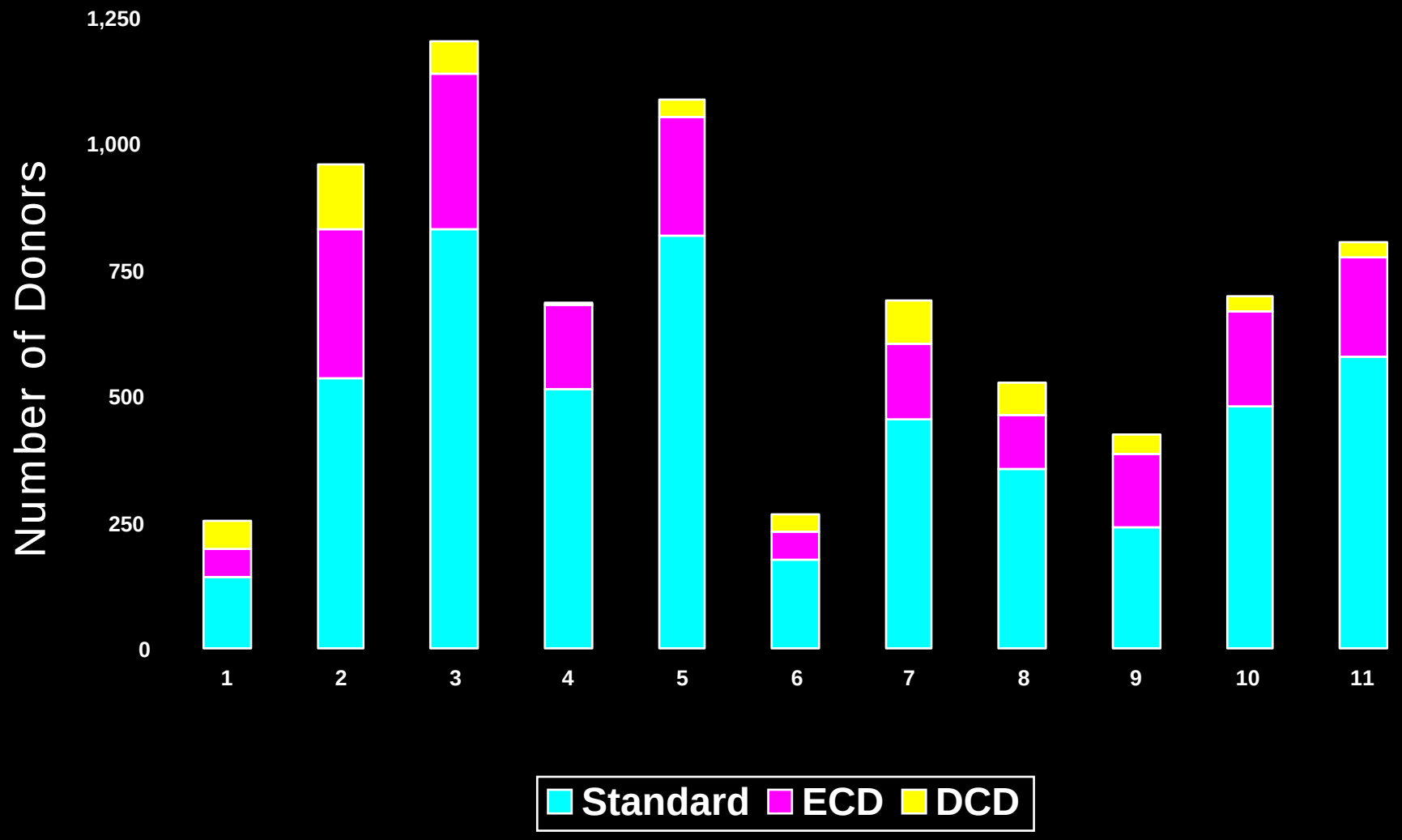
SCD, ECD, and DCD Kidney Transplants, 1997-2006



HRSA Collaboratives began in April 2003

Source: *2007 DRAFT OPTN/SRTR Annual Report,* Table 5.4

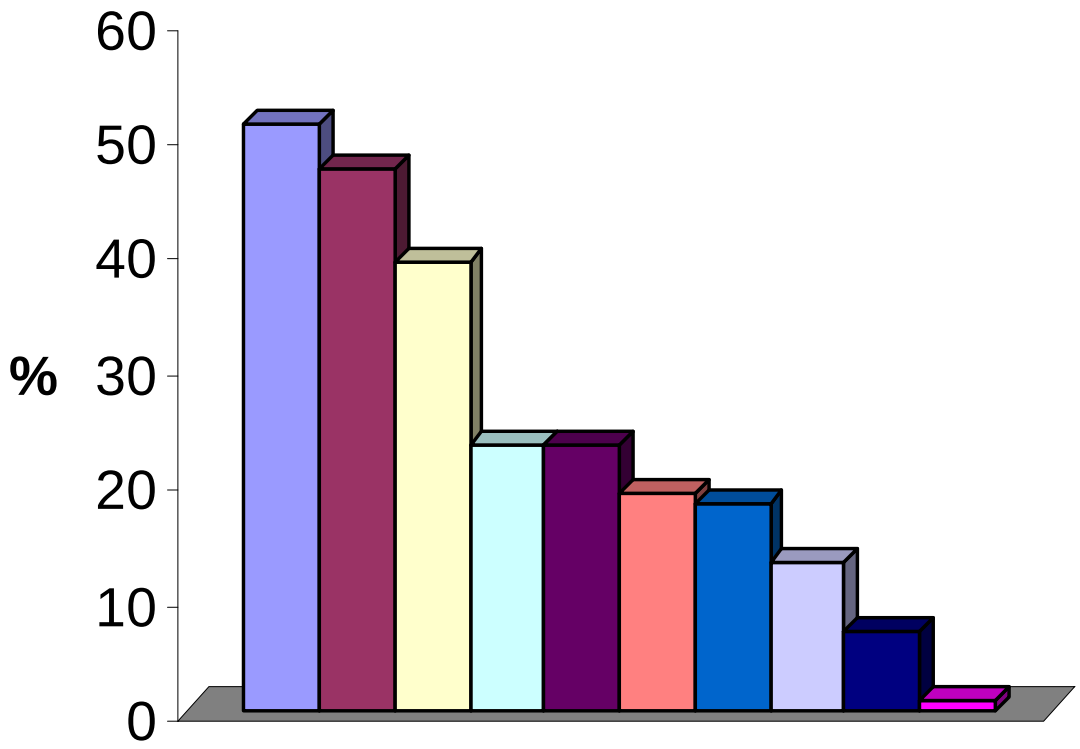
Deceased Donors by Type and Region



What do surgeons find undesirable?

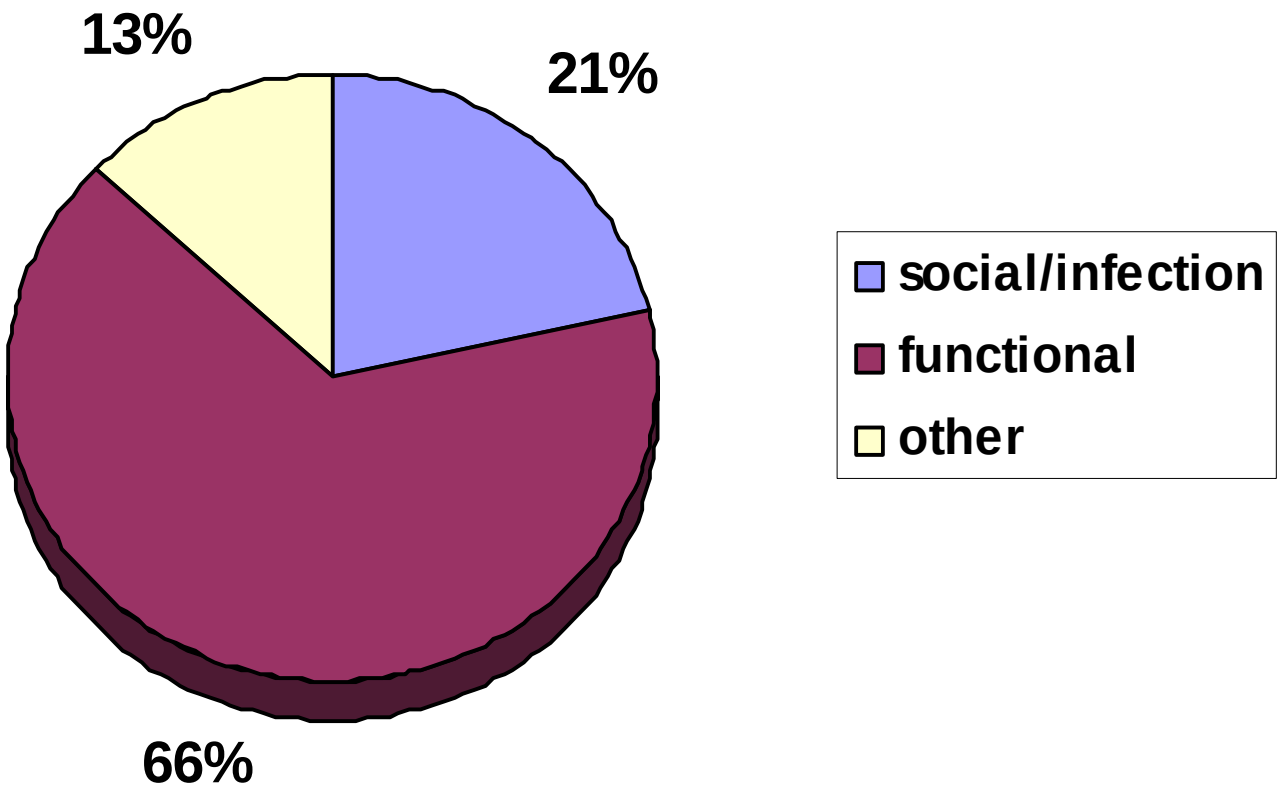
- July 2005 to June 2006
- 107 patients transplanted with 117 non-0 mismatched imported kidneys

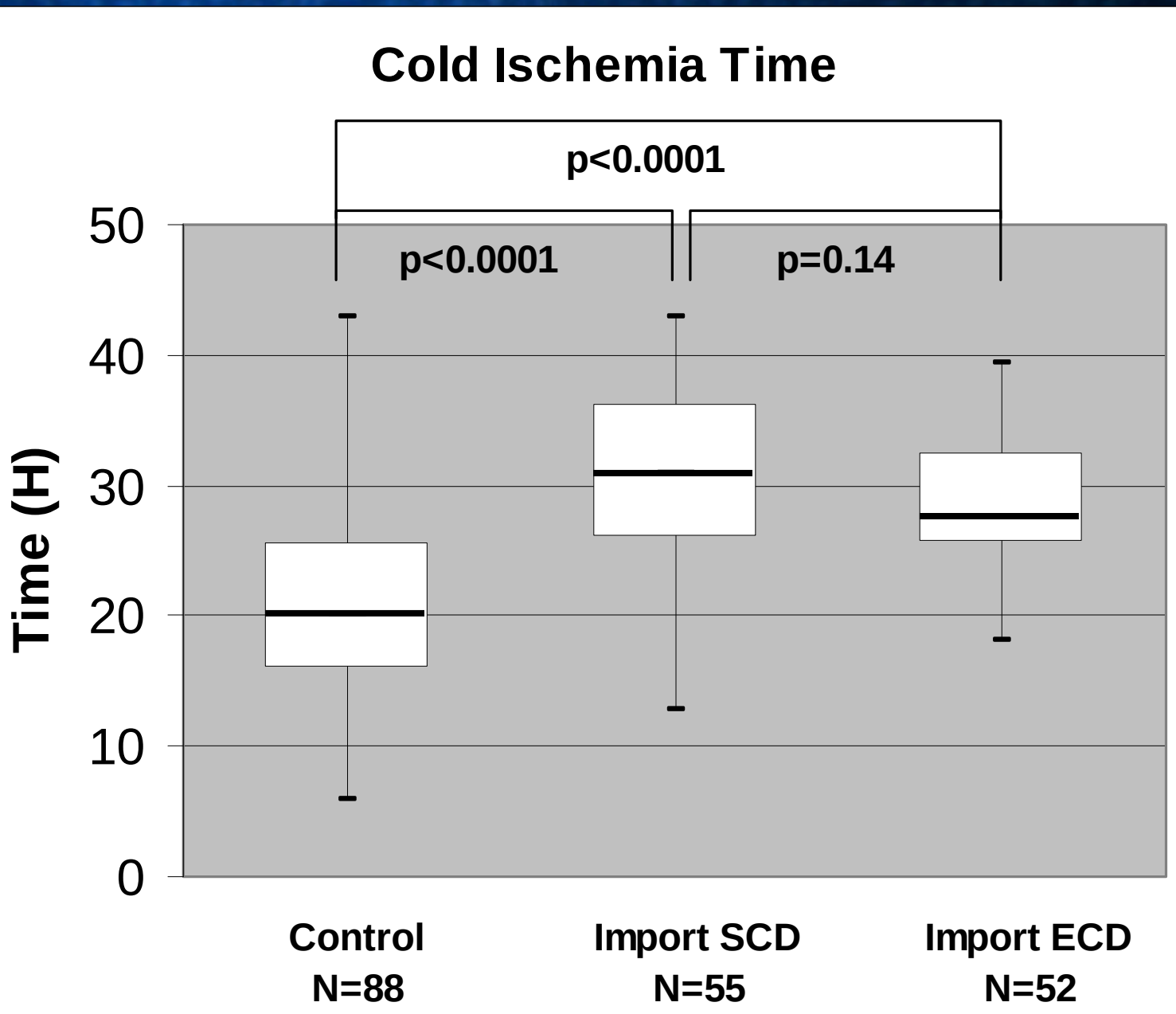
Undesirable Donor Risk Factors

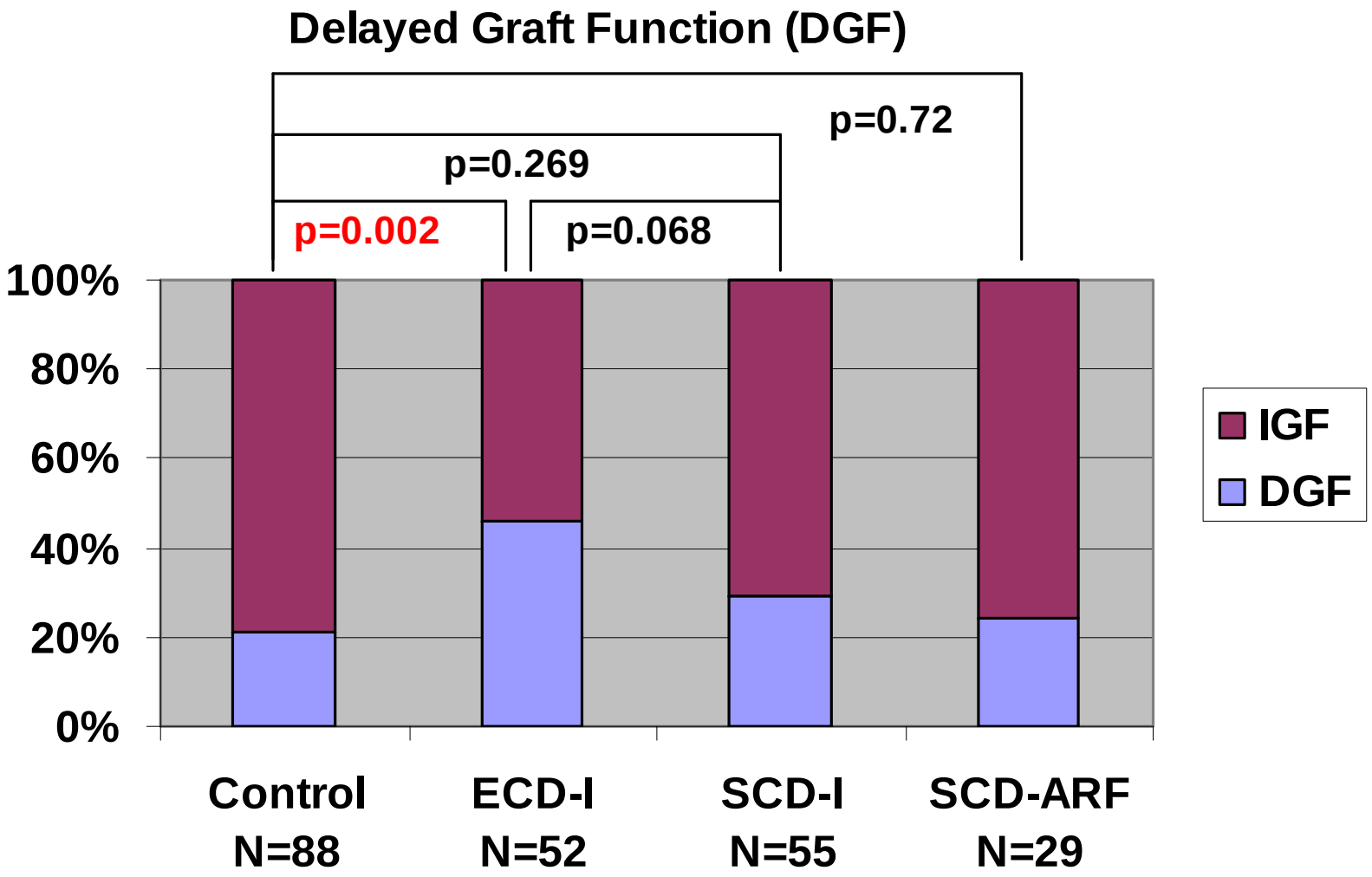


- ECD
- Term Creat >1.5
- Arterial plaque
- Biopsy GS >10%
- Pump flow
- High risk behavior
- Age>65
- Serology
- Parenchymal injury/Mult vessels
- Infection

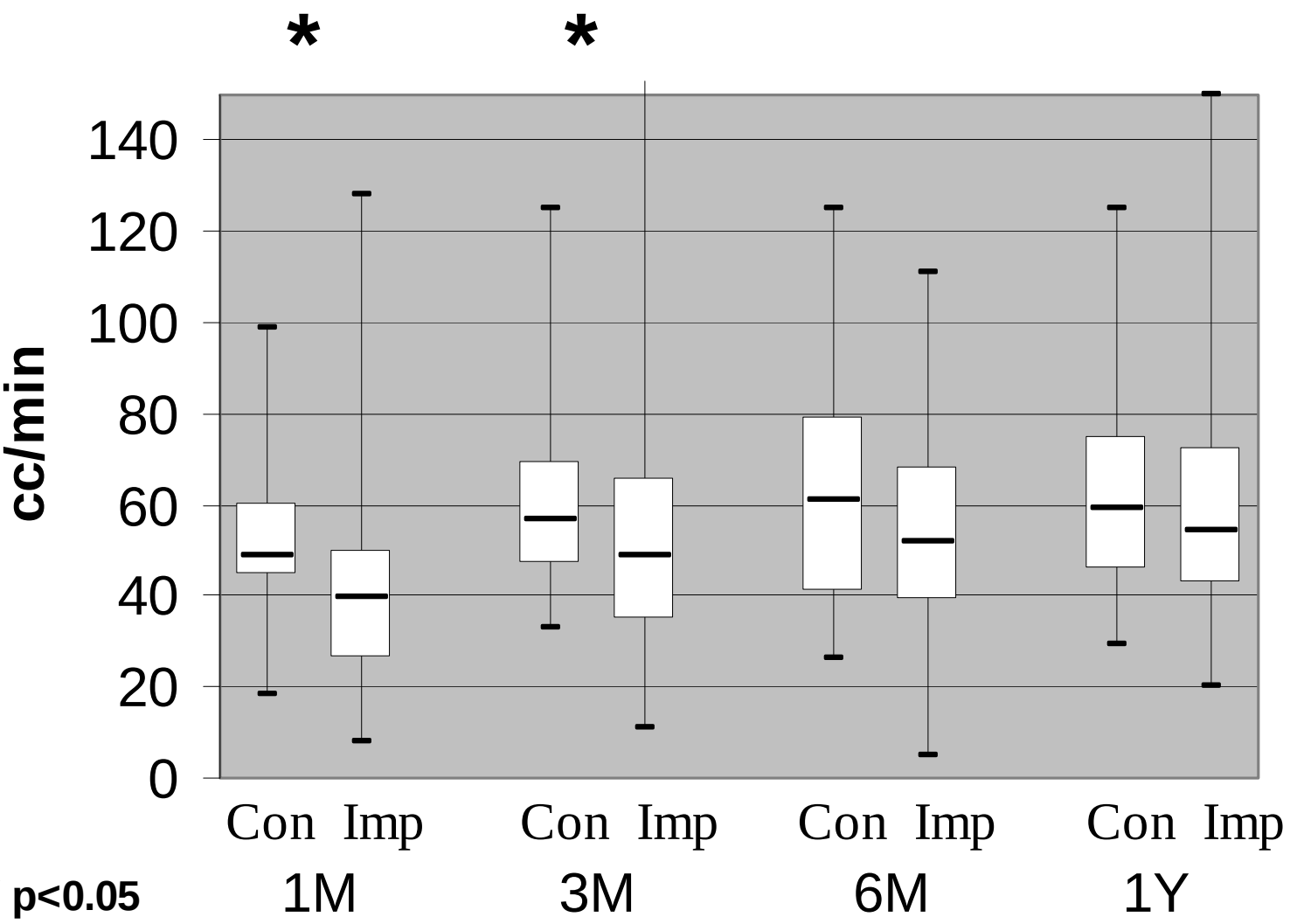
Distribution of Donor Risk




Cold Ischemia Time
p<0.0001
p<0.0001
p=0.14
Time (H)
50
40
30
20
10
0
Control
N=88
Import SCD
N=55
Import ECD
N=52

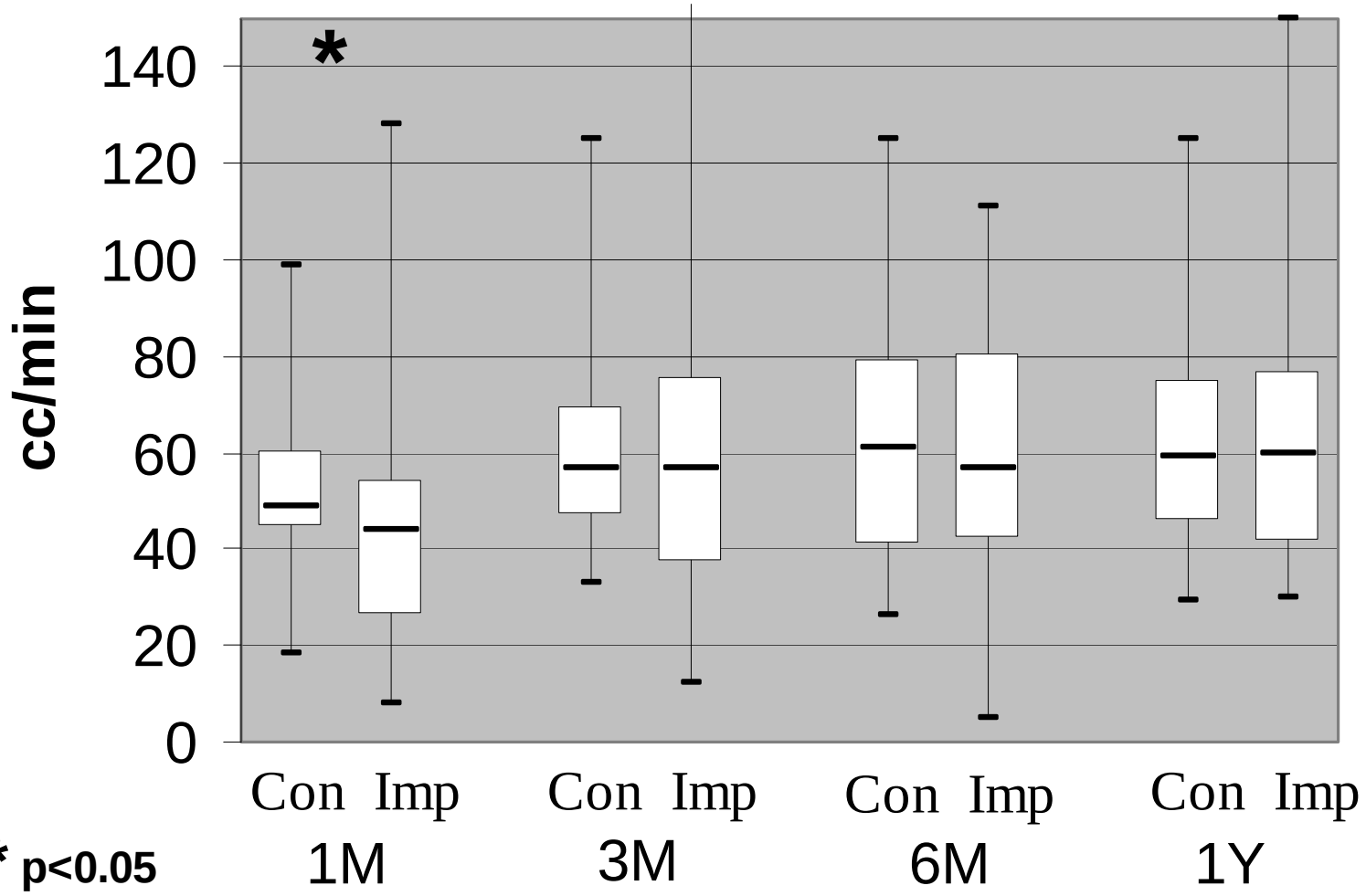

Delayed Graft Function (DGF)
p=0.72
p=0.269
p=0.002
p=0.068
100%
80%
60%
40%
20%
0%
IGF
DGF
Control
N=88
ECD-I
N=52
SCD-I
N=55
SCD-ARF
N=29

Creatinine Clearance for Control (N=88) vs Import (N=107) Allografts



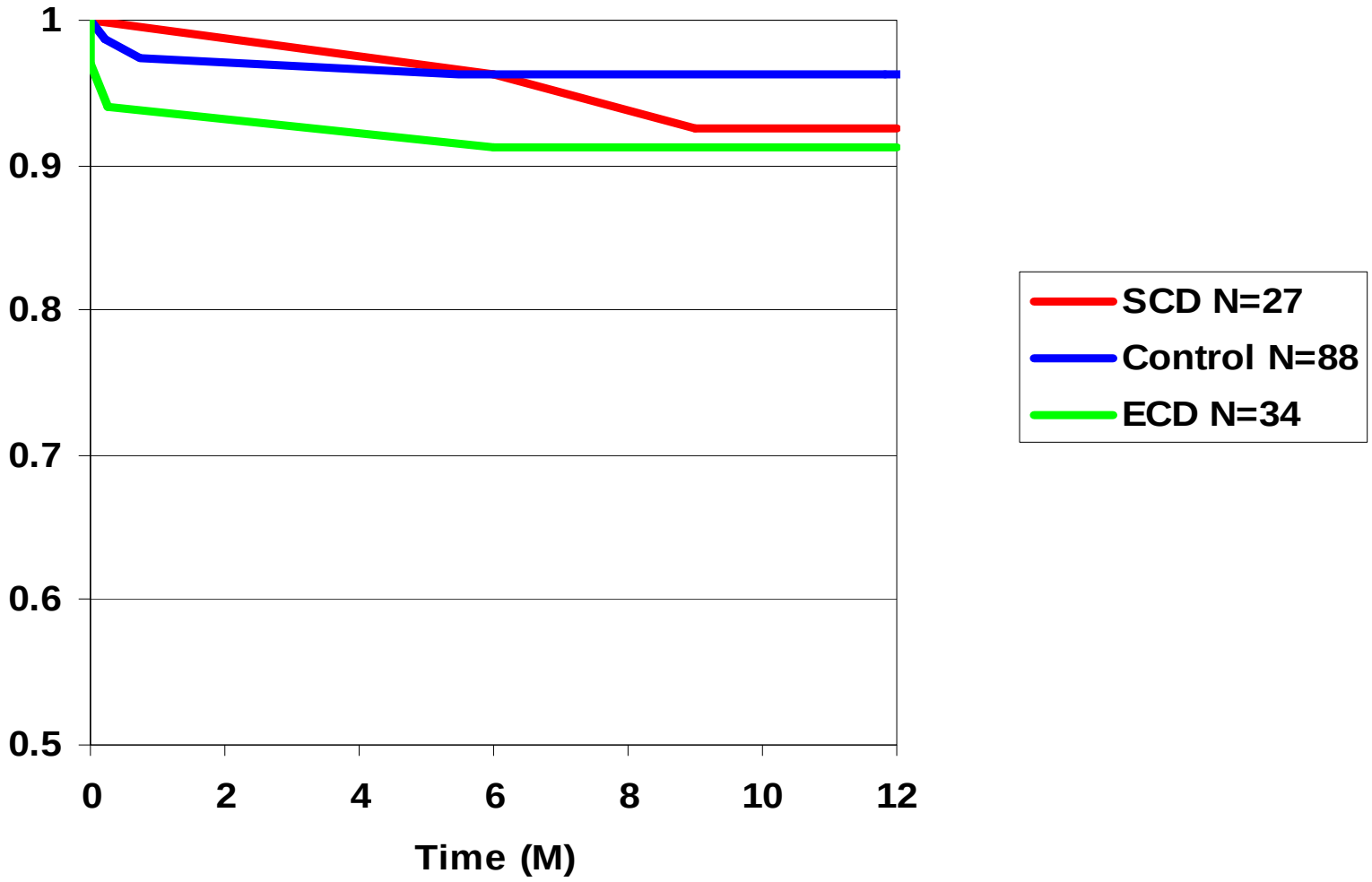
* p<0.05

Creatinine Clearance for Control (N=88) vs Import SCD (N=55) Allografts

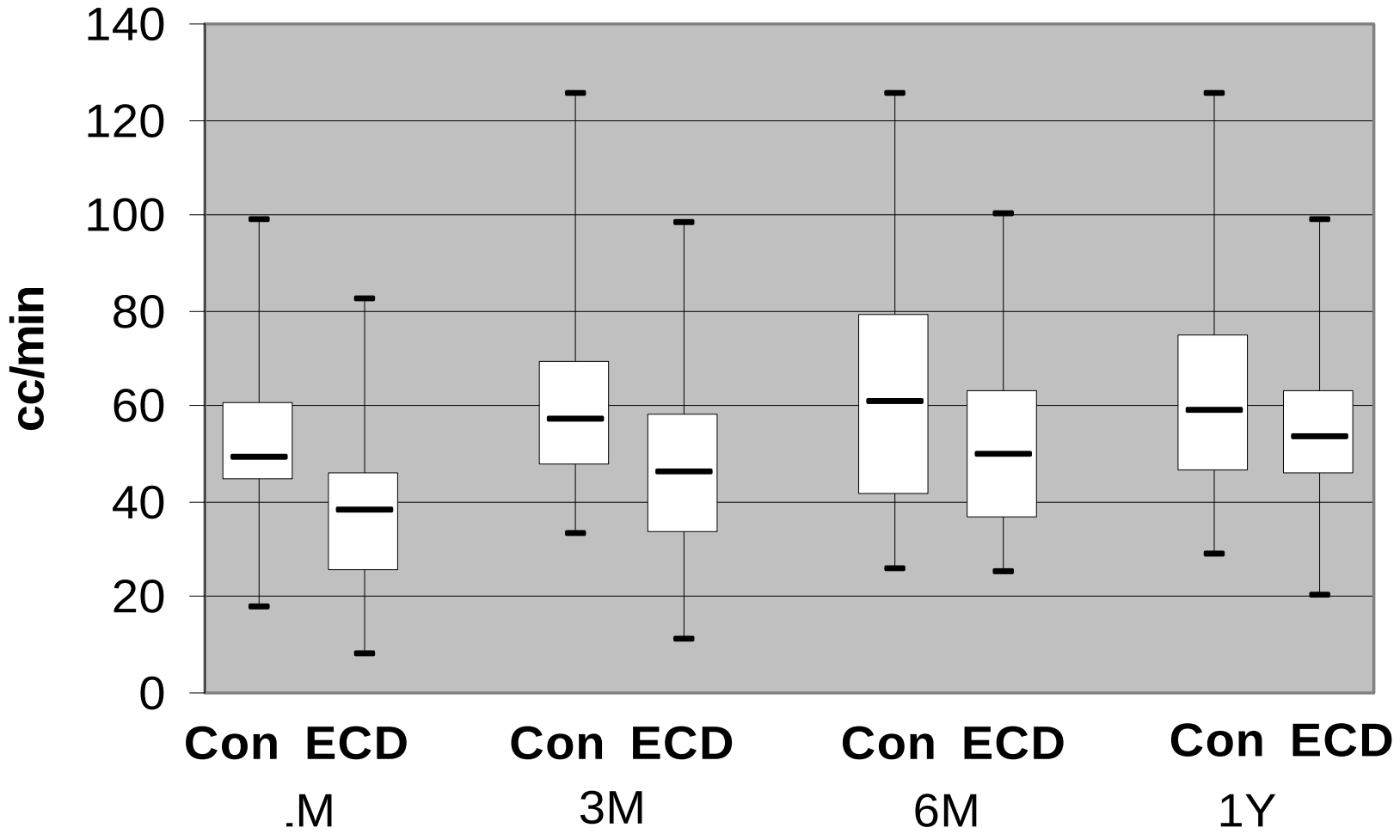


* p<0.05

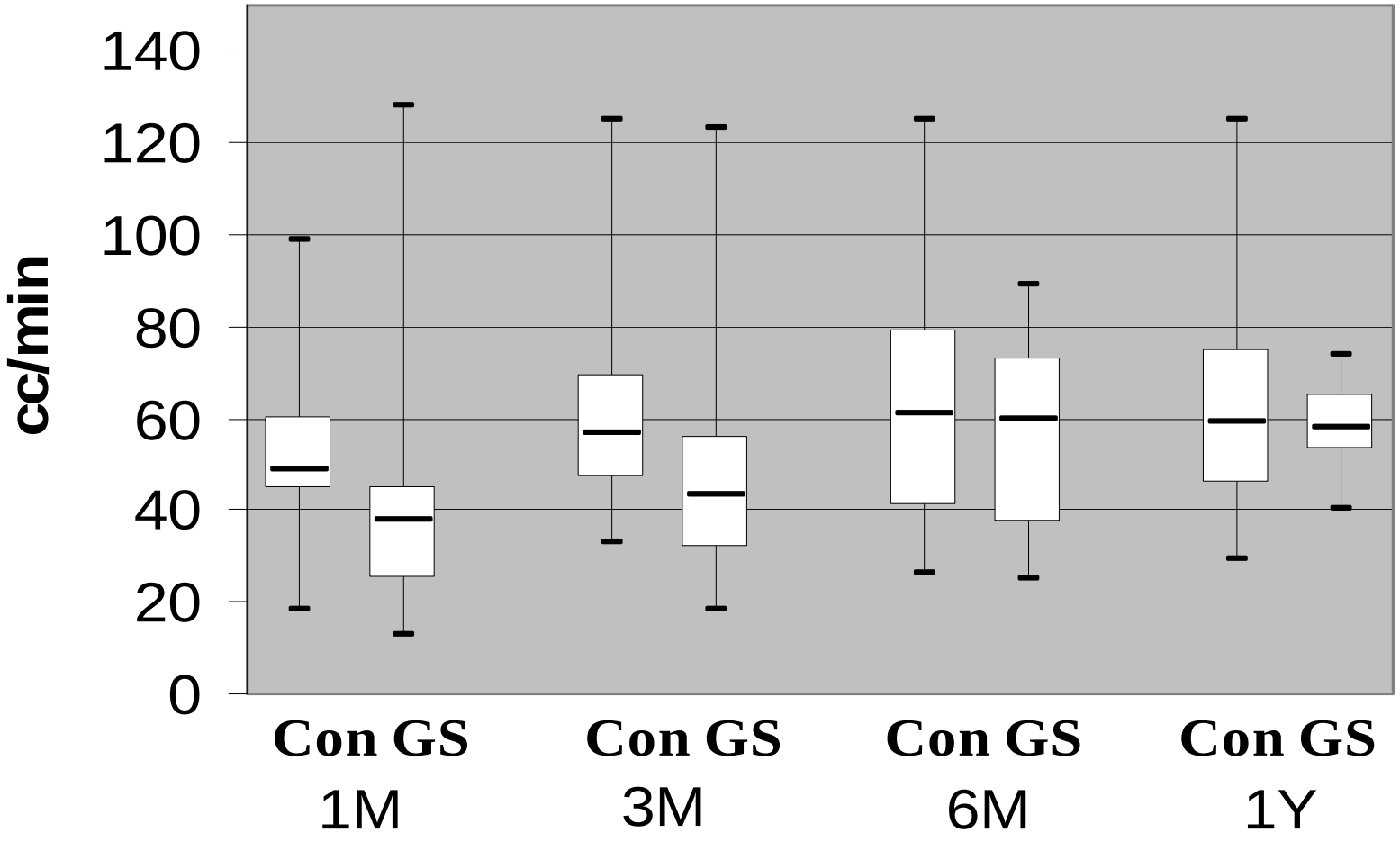
Kaplan-Meier 1 Year Actual Graft Survival



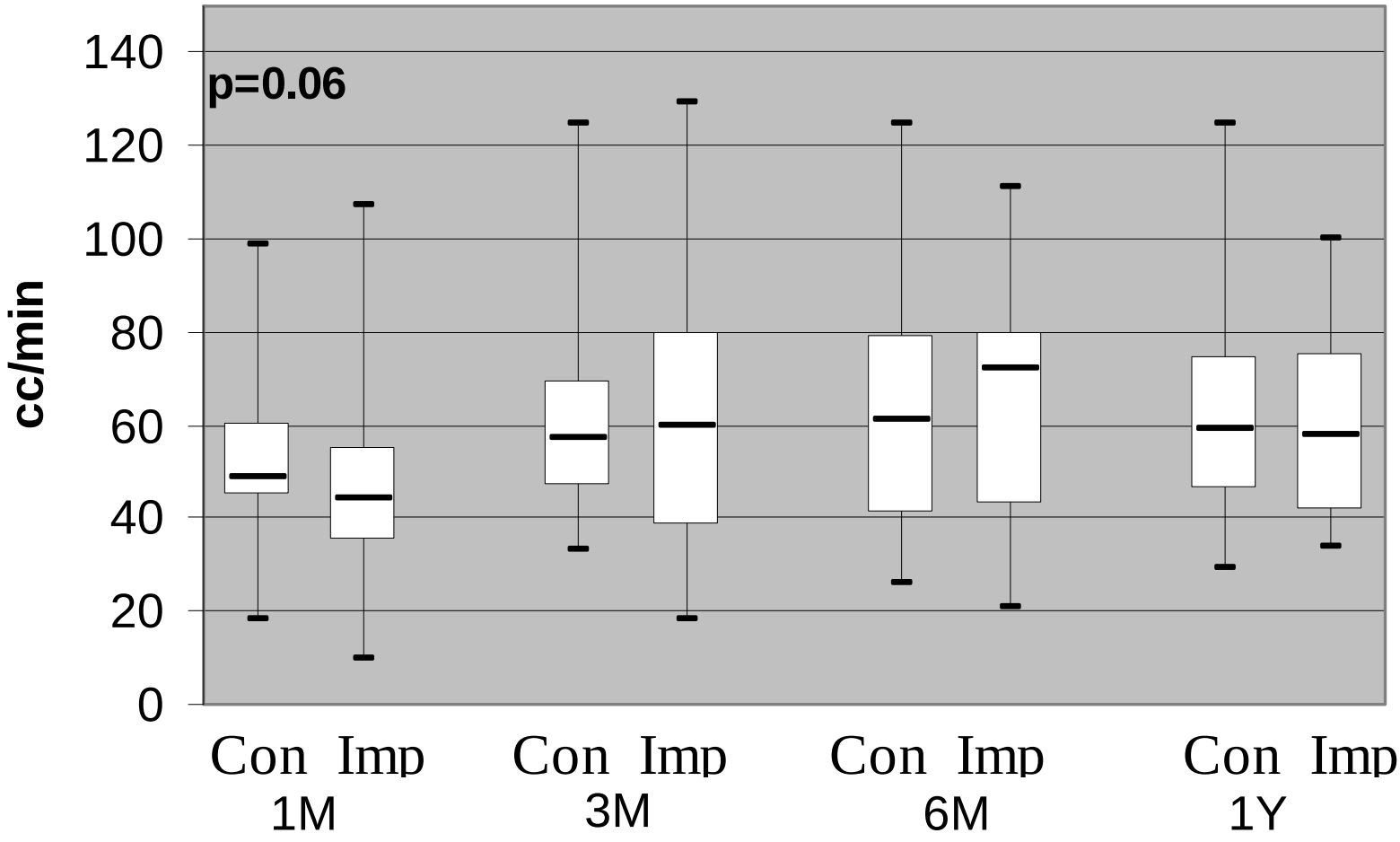
Creatinine Clearance for Control (N=88) vs ECD (N=52) Allografts



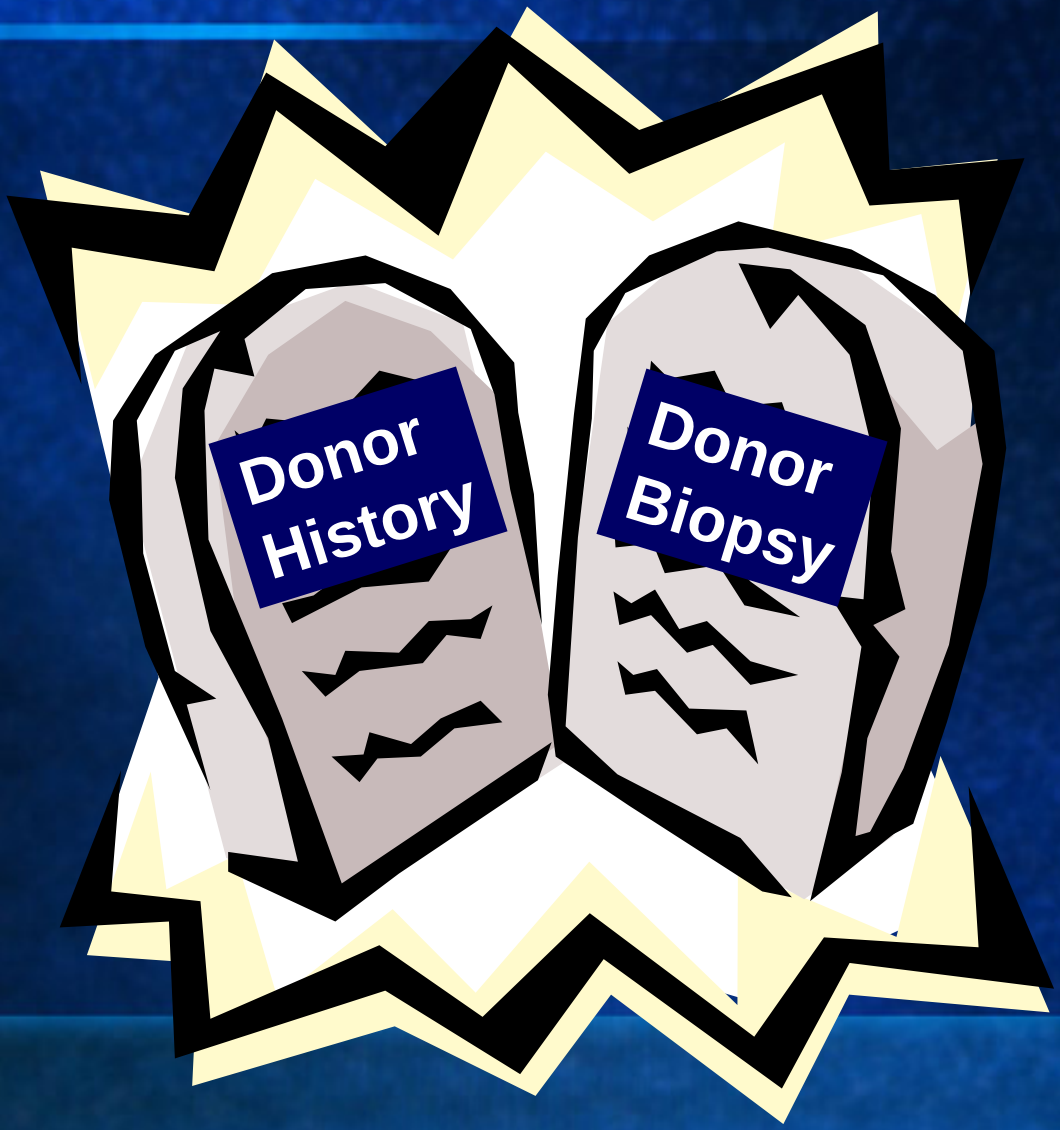
Creatinine Clearance for Control (N=88) vs Allografts with GS>10% (N=24)



Creatinine Clearance for Control (N=88) vs Import SCD ARF Allografts (N=29)



The Key Elements



Long-term outcome of renal transplantation from older donors.

Remuzzi G, Cravedi P, Perna A, Dimitrov BD, Turturro M, Locatelli G, Rigotti P, Baldan N, Beatini M, Valente U, Scalamogna M, Ruggenenti P; Dual Kidney Transplant Group.

N Engl J Med. 2006 Jan 26;354(4):411-3.

METHODS

- Prospective cohort study of 62 recipients with donor biopsy
- Donors over 60 years old
- Compared to 2 groups above and below donor age 60, without biopsy

Long-term outcome of renal transplantation from older donors.

Remuzzi G, Cravedi P, Perna A, Dimitrov BD, Turturro M, Locatelli G, Rigotti P, Baldan N, Beatini M, Valente U, Scalamogna M, Ruggenenti P; Dual Kidney Transplant Group.

N Engl J Med. 2006 Jan 26;354(4):411-3.

RESULTS

- 3 year graft survival in cohort similar to positive-reference group (93%), but superior to negative-reference group (72%)
- 2 Predictive factors, age of donor and performance of histologic evaluation

Deceased-donor characteristics and the survival benefit of kidney transplantation.

Merion RM, Ashby VB, Wolfe RA, Distant DA, Hulbert-Shearon TE, Metzger RA, Ojo AO, Port FK.

JAMA. 2005 Dec 7;294(21):2726-33.

- Retrospective cohort using registry data
- Survival benefit seen at 3.5 years when compared with standard criteria donor recipients, due to early ECD mortality
- DSAs with median wait times >1350 days, ECD recipients had 27% lower risk of death than those on dialysis
- DSAs with shorter wait times, ECD donors showed survival advantage in diabetics

PREEMPTIVE EXPANDED-CRITERIA DECEASED DONOR RENAL TRANSPLANTATION IN PATIENTS OVER 60 YEARS OLD: ANALYSIS OF THE UNOS DATABASE.

Piotr Witkowski, Michael Goldstein, Mark A Hardy, Abbas A Rana, Karim J Halazun, Lloyd Ratner.
Columbia University, Department of Surgery

- Preemptive renal transplantation in this group was performed in 2064 (11%) recipients with non-ECD kidneys and 776 (5%) with ECD kidneys. Patient survival after ECD preemptive renal transplantation did not differ statistically from survival after non-ECD kidney transplantation in patients on dialysis >60 years (p=0.4), whereas as in younger recipients, survival after preemptive ECD transplantation was significantly worse than non-ECD transplants (1,5,10 year survivals of 0.95, 0.82, 0.66 vs. 0.95, 0.86, 0.70, p <0.05).

- ECD preemptive renal transplantation offers the same life expectancy as non-ECD transplantation in patients > 60 on dialysis. In addition such preemptive procedures allow patients to avoid the morbidity and mortality associated with waiting for on dialysis for a suitable graft.

IMPACT OF THE EXPANDED CRITERIA DONOR ALLOCATION SYSTEM ON CANDIDATES FOR AND RECIPIENTS OF EXPANDED CRITERIA DONOR KIDNEYS

Sung RS, Guidinger MK, Leichtman AB, Lake C, Metzger RA, Port FK, Merion RM

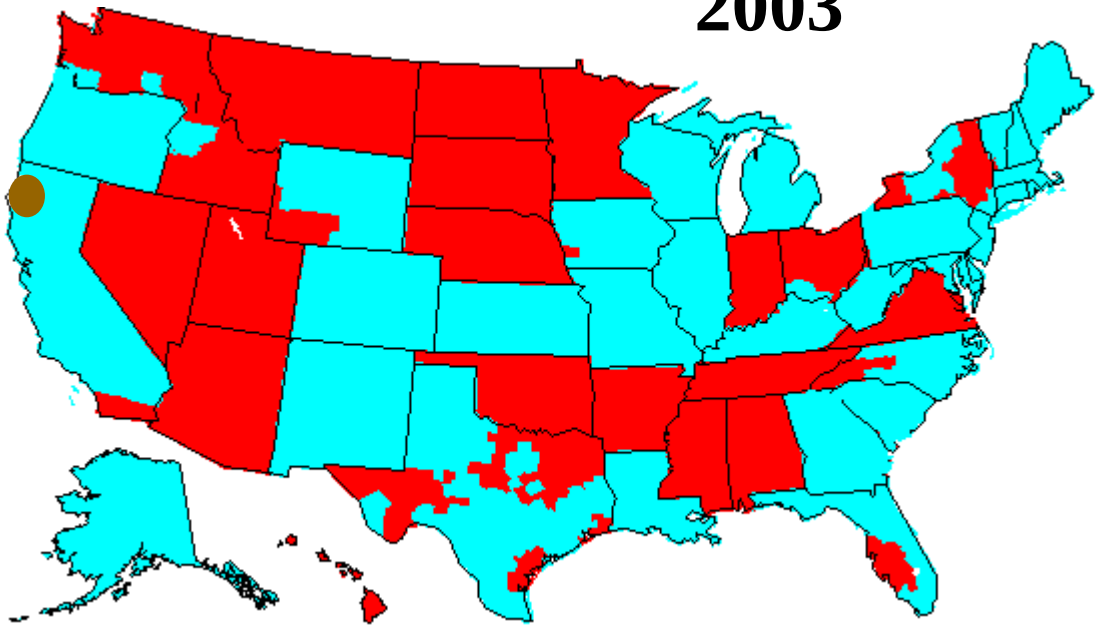
SRTR, UNIVERSITY OF MICHIGAN HEALTH SYSTEM

Transplantation. 2007 Nov 15; 84 (9): 1138-44

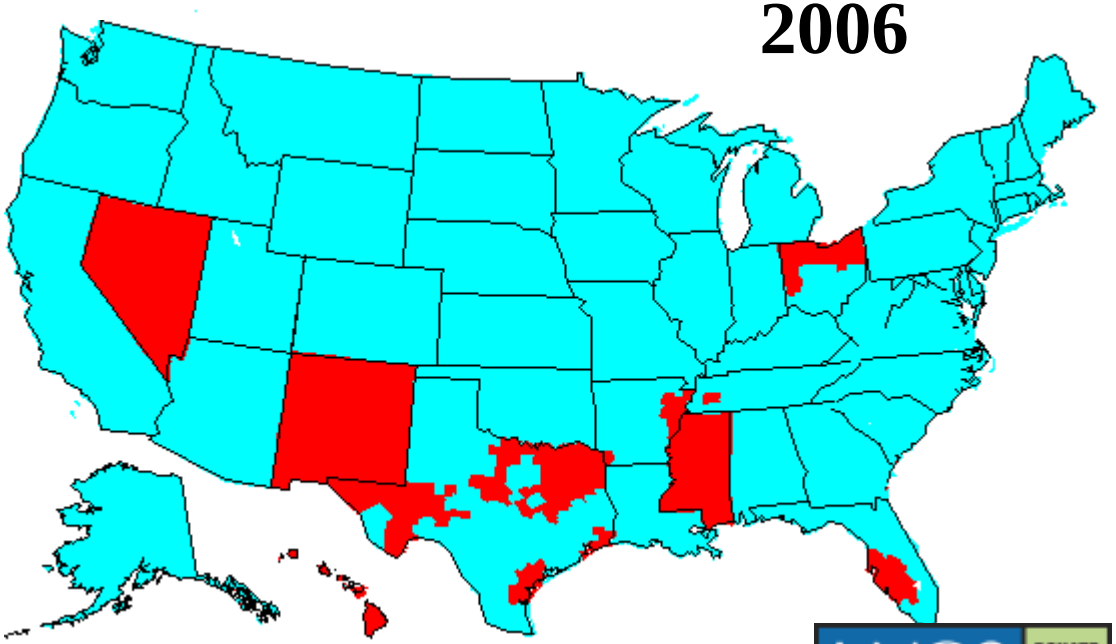
- As of Oct 2005, 42.6% of patients were listed with ECD designation
- ECD candidates were likely to be older, diabetic, and sensitized
- More likely to receive ECD if recipients were older or from DSAs with higher percentage of ECD transplants performed
- CANDIDATES LISTED FOR ECD WERE 41% MORE LIKELY TO RECEIVE A TRANSPLANT

DCD Recovery by DSA

2003



2006



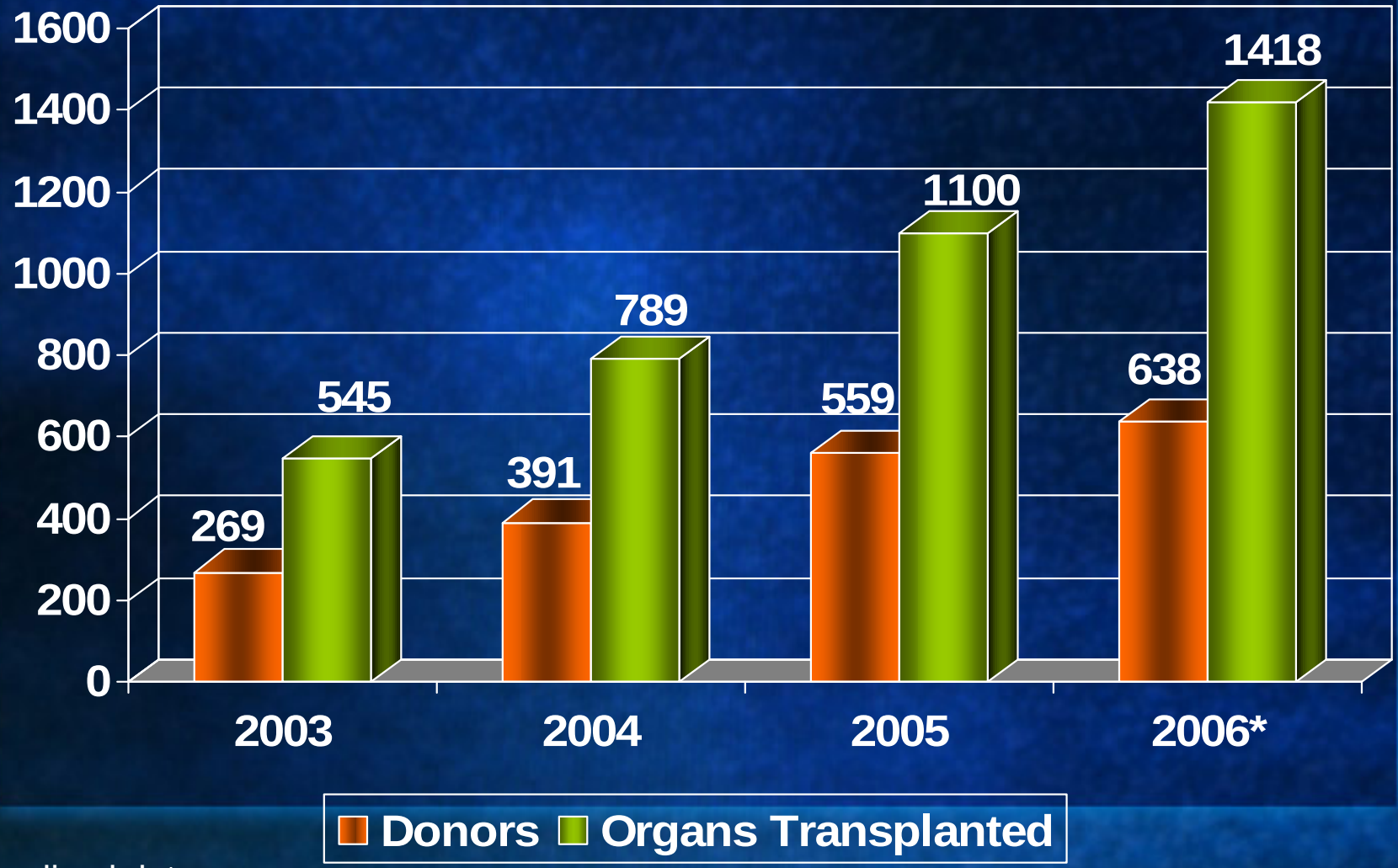
Number Recovered:

- None Recovered
- At Least 1 Recovered

OPTN

UNOS DONATE LIFE

DCD Donors and Organs for Transplantation



*annualized data

Outcomes of kidneys from donors after cardiac death: implications for allocation and preservation.

Locke JE, Segev DL, Warren DS, Dominici F, Simpkins CE, Montgomery RA.

Am J Transplant. 2007 Jul;7(7):1797-807. Epub 2007 May 25.

- Outcomes of 2562 DCD, 62,800 standard criteria donor (SCD) and 12,812 expanded criteria donor (ECD) transplants reported between 1993 and 2005
- Donor age was the only criterion used in the definition of ECD kidneys that independently predicted graft loss among DCD kidneys
- Kidneys from DCD donors <50 had similar long-term graft survival to those from SCD (RR 1.1, p = NS)

Summary

- The waitlist is older and sicker than 10 years ago
- The concept of LYFT is already in practice even prior to formal allocation policy
- LD and SCD kidneys are optimal for most recipients
- Utilization of ECD kidneys should be maximized in areas with long waiting times and matched with recipient needs and risk factors

Summary

- Prolonged cold ischemia should be a consideration, but not a deterrent from pursuing imported allografts
- DCD kidneys from donors under 50 may be optimal for all recipients
- Patients with CKD over 60 are ideal patients for ECD and potentially DCD allografts