

# Short-term transplant survival of living donor kidney transplants in the UK

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## Introduction

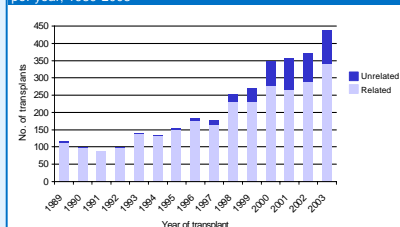
The number of kidney transplants from living unrelated donors has been increasing rapidly in the UK in recent years. This study reports on HLA mismatches and one and three-year transplant outcome of all living related donor (LRD), living unrelated donor (LURD) and cadaveric heartbeating donor (HBD) transplants in the UK between 1998 and 2003. The effects of HLA matching and other factors on living donor transplant outcome were also investigated.

## Methods

- HLA mismatches of 2039 living related and unrelated kidney donor transplants and 7421 cadaveric heartbeating donor transplants were compared.
- Kaplan-Meier survival curves were used to illustrate differences in transplant outcome of first grafts: a subset of 1378 living related, 364 living unrelated and 6070 HBD transplants. Associated p-values were derived from a univariate log-rank test.
- Cox proportional hazards regression models were used to analyse the combined effect of many factors on transplant survival of first living donor transplants.
- Transplant survival time was determined by time from transplant to transplant failure, this being the earlier of return to regular dialysis or patient death.

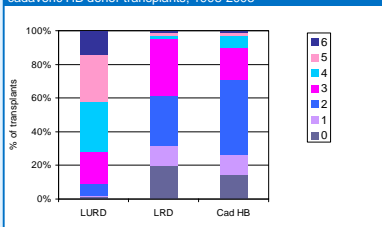
## Results (1)

Number of related and unrelated living donor kidney transplants per year, 1989-2003



- Since 1997, there has been a marked increase in the total number of living donor transplants performed each year, increasing from 179 in 1997 to 439 in 2003.
- Living unrelated donor transplants have increased from 7% of all living donor transplants in 1997 to 22% in 2003.

HLA-A+B+DR mismatches of living unrelated, related and cadaveric HB donor transplants, 1998-2003



- Transplants from living unrelated donors were significantly less well matched than LRD and cadaveric HBD transplants ( $p < 0.0001$ ). There were 5 or 6 HLA-A+B+DR mismatches in:
  - 42% of LURD transplants
  - 3% of LRD transplants
  - 3% of HBD transplants

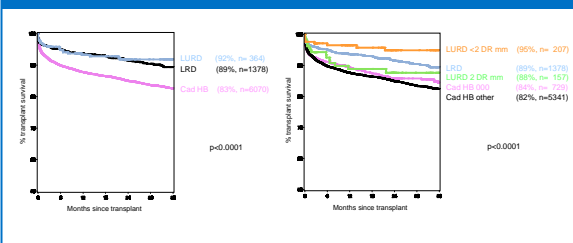
Donor relationship for living related and unrelated donor kidney transplants, 1998 - 2003

Donor relationship to recipient	N	%
Parent	846	42
Sibling	681	33
Other related	110	5
Spouse	303	15
Partner	22	1
Other unrelated	77	4
<b>Total</b>	<b>2039</b>	<b>100</b>

- The majority of live donor transplants resulted from parental donations (42%) while one-third of kidneys were donated by siblings and one-fifth by genetically unrelated donors.

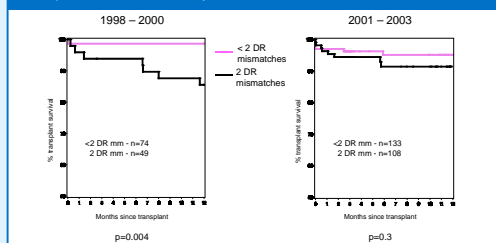
## Univariate survival analysis of first living donor transplants

Three-year transplant survival of first transplants, 1998 - 2003



- There was no significant difference in three-year transplant survival between the two living donor transplant groups: first LRD transplants 89% (95% CI 87-91%), first LURD transplants 92% (95% CI 89-95%).
- Three-year transplant survival of HBD grafts (83%, 95% CI 82-84%) was inferior ( $p < 0.0001$ ).
- There was no difference in three-year transplant survival between two HLA-DR mismatched living unrelated donor transplants (88%, 95% CI 82-93%) and 0/0 HLA-A,B,DR mismatched HBD transplants (84%, 95% CI 81-87%).

One-year transplant survival of first living unrelated donor transplants, 1998-2003, by DR mismatches



- There was some evidence of a difference between living unrelated donor grafts with less than two HLA-DR mismatches and those with two mismatches. However, when the cohort is divided into early (1998-2000) and late (2001-2003) transplants, there is a significant effect of DR mismatches on one-year transplant survival in the early half of the cohort only.

## Results (2)

### Multifactorial survival analysis of first living donor transplants

Relative risks of renal transplant failure in the first year, 1998 - 2003

Factor	Level (baseline)	N	RR	95% CI	p
Donor age	(18 - 34)	305	1.0		
	35 - 49	767	1.4	0.7 - 2.8	0.3
	50 - 59	494	2.0	1.0 - 4.0	0.04
	>= 60	176	3.3	1.5 - 7.3	0.003
Recipient age	(< 35)	868	1.0		
	35 - 49	547	0.6	0.3 - 0.9	0.02
	>= 50	327	0.7	0.4 - 1.2	0.2
Gender match	(M donor / M recipient)	458	1.0		
	M donor / F recipient	353	1.8	1.0 - 3.5	0.07
	F donor / M recipient	616	1.6	0.9 - 3.0	0.1
	F donor / F recipient	315	2.4	1.3 - 4.4	0.007
HLA - A+B+DR mismatches		1742	1.1	1.0 - 1.3	0.06

- Cox regression modelling of one-year transplant survival of 1742 first living donor transplants showed significant effects of donor and recipient age, gender match of donor and recipient and the number of HLA-A+B+DR mismatches.

## Summary

- As expected, living unrelated donor transplants were significantly less well HLA matched than other donor transplants.
- Three-year transplant survival was comparable for LRD and LURD transplants and was better than survival of cadaveric HBD transplants.
- Three-year transplant survival was comparable for LURD transplants with 2 HLA-DR mismatches and cadaveric HBD transplants with 0/0 HLA-A,B,DR mismatches.
- Analysis of one-year outcome of living donor transplants showed significant effects of donor and recipient age, donor-recipient gender match and the sum of HLA-A, B and DR mismatches.