

## English transplant centre variation in early (30 day) and late (365 day) readmission rates following renal transplantation – a UK Renal Registry and GIRFT analysis of Hospital Episode Statistics (HES)

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### Background:

Emergency hospital readmission (EHR) rates following surgical procedures are widely used as a quality of care metric due to associations with avoidable morbidity and the additional financial cost to the healthcare system and emotional burden for patients and caregivers.

### Aims:

In this study we aim to establish, for the first time, EHR rates following adult renal transplantation in England, in a national contemporaneous cohort. An attempt has been made to assess for variation in EHR rates between recipients of live donor (LD) and deceased donor (DD) kidneys, between 19 English renal transplant centres and to identify risk factors for readmission.

### Methods:

Adult kidney transplant recipients in England 2012-2016 and their EHR post transplantation (0-365 days) were identified using English, Hospital Episode Statistics (HES). All planned/elective admissions and those with a length of stay < 1 day were excluded from analysis.

The proportion of patients with first EHR early (0-30 days) and late (0-365 days) post-transplant were compared for recipients of DD and LD kidney transplants (chi squared/t-test). Additionally, we calculated the proportion of patients with multiple ( $\geq 2$ ) EHR and the mean EHR bed nights per transplant recipient nationally and at individual renal transplant centre level. Centre level EHR rates were adjusted for age and sex to allow comparison between units.

Additional patient demography was extracted from data linkage to the UK Renal Registry (UKRR) and logistic regression was used to calculate odds ratios for admission risk associated with these demographic factors.

### Results:

There were 8,072 DD and 3,729 LD kidney transplants between 2012-2016.

Proportions of patients with an EHR were: 0-30 days (23%DD vs 22%LD,  $p=0.17$ ), 0-365 days (58%DD vs 50%LD,  $p<0.0001$ ) and multiple readmissions 0-365 days (33%DD vs 25% LD,  $p<0.0001$ ). Mean EHR bed nights in England were 10.2 (95% CI, 9.7 - 10.6) per DD recipient and 6.1 (95% CI, 5.6 - 6.5) per LD recipient.

Age/sex adjusted readmission rates (0-365 day) varied considerably between centres from 37%-76% DD recipients and 43%–79% LD recipients (Figure 1). Mean bed nights per transplant recipient also varied considerably between units, 5.2-15.5 for DD recipients and 3.3-9.3 for LD recipients.

Risk Factors for admission included age over 60, female sex and social deprivation (Table 1).

#### Discussion:

In this analysis of almost 14,000 contemporaneous adult recipients of a renal transplant, one in 5 adult renal transplant recipients in England require EHR within 30 days of their surgery and over half will have at least one EHR within the first year post transplant.

Recipients of DD and LD kidneys had similar EHR rates by 30 days but by 365 days recipients of a DD kidney had a higher EHR rate. Female sex, age over 60 and social deprivation are all risk factors for admission.

There appears to be a centre effect impacting upon EHR. Patient and transplant level factors should be further explored, alongside individual transplant unit care pathways and outpatient follow up intensity to allow better understanding of factors underlying this variation and how services might best reduce emergency post renal transplant readmissions.