

Living Donor Kidney Transplantation

This Policy replaces
POL274/1

Copy Number

Effective 02/04/2020

Summary of Significant Changes

Section 1, Introduction – Under HTA approval requirements, all donors are requested to specify their preferred destination of the donated kidney if it cannot be implanted into the intended recipient after nephrectomy.
Section 2 – Criteria for paired/pooled donation (PPD) and altruistic donor chains (SDC) re-written. Addition of Table 1 to show complex donor information required for any donor to be included in the complex donor matching run prior to each quarterly matching run.
Section 2.1.2 – Anonymity between donor and recipient is required before surgery but may be broken afterwards if all parties agree.
Section 2.1.2, Surgical Sharing Weeks – Sharing weeks may be extended to accommodate peak holiday times (eg Christmas and New Year).
Section 2.1.3, Incomplete exchanges, prioritisation for transplantation, Option 2 – Additional information included regarding the use of a kidney if it cannot be implanted into the intended recipient when the kidney has been dispatched to the transplant centre.
Section 2.2.1 Change to the default for all non-directed altruistic donors (NDAD)
Section 4, Direct Living Donation – if a recipient within a direct living donor pair cannot be transplanted from their intended donor and is directed towards an alternative recipient, the recipient who has missed out on transplant, is eligible for prioritisation. Redirection of the donated kidney will be by local allocation.
Section 6.2 A previous donor (recipient) awarded special prioritisation will be ranked above all other non-prioritised patients within their qualifying tier/level (Tiers A and B¹),

Policy

This policy has been created by the Kidney Advisory Group on behalf of NHSBT.

The policy has received final approval from the Transplant Policy Review Committee (TPRC), which acts on behalf of the NHSBT Board, and which will be responsible for annual review of the guidance herein.

Reviewed: August 2019
Approved by TPRC: October 2019

Purpose

The aim of this document is to provide a policy for the allocation and acceptance of living donor kidneys to adult and paediatric recipients in the UK. These criteria apply to all proposed recipients of organs from living donors.

In the interests of equity and justice all centres should work to the same allocation criteria.

Non-compliance to these guidelines will be handled directly by NHSBT, in accordance with the *Non-Compliance with Selection and Allocation Policies* [POL198](#).

It is acknowledged that these guidelines will require regular review and refreshment. Where they do not cover specific individual cases, mechanisms are in place for the allocation of organs in

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exceptional cases.

1. Introduction

This policy describes all aspects of living donor kidney transplantation including:

- UK Living Kidney Sharing Schemes (UKLKSS) including paired/pooled donation (PPD) and altruistic donor chains (ADC)
- Non-directed altruistic donation (NDAD) and directed altruistic donation (DAD)
- Direct living donation
- Domino kidney transplantation

The policy was formed from existing criteria developed as part of the Kidney Advisory Group (KAG). Matching criteria, both for blood group and human leucocyte antigen (HLA) are consistent with the deceased donor organ allocation policy¹, unless otherwise stated.

Under HTA approval requirements, all donors are consented prior to surgery to specify their preferred destination of the donated kidney if it cannot be implanted into the intended recipient after the nephrectomy. These include allocation to another recipient, re-implantation into the donor or research.

For questions related to the policy or advice, please contact Lead Nurse for Living Donation or Statistical Leads for Kidney Transplantation.

2. UK Living Kidney Sharing Schemes

2.1 Paired/pooled donation (PPD) and altruistic donor chains (ADC)

2.1.1 Living Donor Kidney Matching Run

Donors and recipients who are suitable and where the recipient is entitled to NHS treatment may be registered in the UK scheme as follows:

- Donor-recipient pairs to identify possible transplants within PPD exchanges (with other pairs) or within ADCs. More than one donor can be registered for each recipient.
- Non-directed altruistic donors (NDAD) to enable ADCs, unless there is high priority recipient on the national transplant list (NTL) (see 2.2.1)
- Directed altruistic donors (DAD) with an identified recipient to facilitate PPD

Living Donor Kidney Matching Runs (LDKMR) identify all possible exchanges for recipients and donors registered and are performed quarterly in January, April, July and October. Matches are based on HLA and blood group compatibility, with all blood group identical and compatible matches permitted. To minimise the risk of non-proceeding transplants, minimum essential criteria are required at recipient registration in the UKLKSS including:

- Maximum donor age
- HLA mismatch grade, where there is a preferred mismatch grade.

Additional recipient criteria can be specified. These must be confirmed prior to inclusion in each LDKMR following discussion with the recipient, as follows:

- A different list of unacceptable antigens from those specified on the deceased donor transplant list
- Additional blood group compatibility.

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Once all potential exchanges have been identified, the optimal number of transplants is obtained using an optimisation algorithm developed in collaboration with the University of Glasgow, School of Computing Science (<http://www.gla.ac.uk/schools/computing/>). The optimal combination of exchanges (either 2-way, 3-way, short or long altruistic donor chains) are identified using the following criteria:

- i. maximise the number of effective 2-way exchanges (including 3-way exchanges with embedded 2-way exchanges)
- ii. subject to (i), maximise the total number of transplants
- iii. subject to (i) and (ii), minimise the number of 3-way exchanges
- iv. subject to (i) to (iii), maximise the number of embedded 2-way exchanges in the 3-way exchanges
- v. subject to (i) to (iv), the overall *match score* is maximised (i.e. the sum of scores calculated for each potential transplant in all exchanges in the result)

Match scores

A score is calculated for each potential exchange, based on the following factors:

- a. Previous matching run points – the number of quarterly matching runs in which the recipient has previously participated, multiplied by 50
- b. Sensitisation points – 0 to 50 points (for 0 to 100% calculated reaction frequency*)
- c. HLA mismatch points – 15, 10, 5 or 0 points for mismatch levels 1, 2, 3 or 4, respectively.
- d. Donor-donor age difference points – 3 points awarded if donor-donor age difference < 20 years.

**based on comparison with pool of 10,000 donor HLA types on national database*

Clinically complex donors and special considerations

Any donor with clinical considerations that may impact on the donated kidney or health of the recipient must be specified at registration according to agreed criteria and confirmed as 'special considerations' prior to inclusion in each LDKMR (see Table 1).

Prior to the LDKMR, a pre-run is performed to consider potential matches with donors with special considerations. This is to rule out any matches that would be unsuitable to reduce the number of non-proceeding transplants after the LDKMR.

Table 1: Complex donor information required for any donor to be included in the complex donor matching run prior to each quarterly matching run.

Complex Category	Specification	Comments
Kidney function	Absolute GFR (Isotopic or equivalent)	Required for all complex donors
	Unequal split function (<45% of overall absolute GFR)	Only include if relevant
Vascular anatomy (arterial only)	>1 renal artery (confirmed/expected) Polar arteries: position (upper, hilar, lower); size (mms)	Imaging report and outcome of MDT discussion to be made available on request from other centres**
Non-vascular anatomy	Benign tumour; angiomyolipoma; simple cyst > 4cm and site Pelvic ureteric junction obstruction Stone or calcification in the kidney to be donated	Imaging report/s and outcome of MDT discussion to be made available on request from other centres**

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Medical history	Treated hypertension (on medication) Hepatitis B Core Antibody Positive (from previous exposure not vaccination) Kidney biopsy for persistent non-visible haematuria (if performed)	Evidence to be made available on request from other centres
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The deadlines for registration for each LDKMR are published annually on the ODT website (<http://www.odt.nhs.uk/living-donation/uk-living-kidney-sharing-scheme/>). These include specific deadlines for registration of new pairs, reactivation of previously registered pairs, confirmation of pair inclusions and registration of altruistic donors. All clinical and histocompatibility and immunogenetic (H&I) assessment must be up to date and reported before donor-recipient pairs are confirmed for inclusion in each LDKMR to avoid unsuitable matches being identified and to minimise the risk of non-proceeding transplants.

2.1.2 Coordinating Transplants Identified from LDKMR

Once possible transplants have been identified in the LDKMR, compatibility between matched pairs must be confirmed and dates for surgery scheduled. These are coordinated by the living donor coordinators in the transplant centres of the donors and recipients involved.

The Human Tissue Authority (HTA) approval process is conducted via a local Independent Assessor and HTA panel and, as often as possible, should be performed prior to the matching run (unless multiple donors are registered for a single recipient).

An initial crossmatch test must be completed within 7-14 days of notification of the outcome of the LDKMR and transplant centres are asked to keep LKD Schemes (LKDSchemes@nhsbt.nhs.uk) up to date with progress for identified exchanges, including outcomes of crossmatch testing and dates of surgery when these have been confirmed.

Recipients are automatically suspended from the deceased donor transplant list once a match has been identified and until the initial crossmatch confirms compatibility between all donors and recipients in an exchange. Transplant centres are responsible for re-activating recipients on the national transplant list in the event of a positive crossmatch with their matched donor.

Anonymity between donor and recipient is required before surgery but may be broken afterwards, if all parties agree, via the living donor coordinators after surgery.

Surgical Sharing Weeks

Participating transplant centres commit to a designated three week 'sharing' period for UKLKSS surgery for each matching run. During these weeks, centres are asked to reserve routine living donor lists for 'shared' living donor transplants until:

- It is confirmed that there are no matched pairs for a centre in any given matching run
- or
- Dates of surgery are agreed for matched pairs

Sharing weeks are linked with the matching run timetable and published with the annual matching run schedule via the ODT website. The sharing periods are scheduled within a maximum of 8 weeks of the matching run but may be extended to accommodate peak holiday times (e.g. Christmas and New Year).

Non- simultaneous exchanges

The preferred option within the UKLKSS is simultaneous donor surgery for all living donor transplants identified in the quarterly matching runs. However, non-simultaneous surgery is an

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option where necessary to maximise utilisation and overcome logistical barriers to facilitate transplants.

If simultaneous donor surgery cannot be arranged, donor operations should be scheduled as closely together as possible, with a maximum of 14 days apart between any two operations and, preferably, within the designated weeks of surgery. **The Lead Nurse for Living Donation at NHSBT and the Chair of KAG must be notified of all cases of non-simultaneous surgery.**

Careful consideration must be given to cases where clinical considerations are a factor in determining non-simultaneous surgery and should only be used in exceptional circumstances. **All such cases must be approved by the Chair of KAG.**

When a period of more than 14 days between any two donor operations is necessary, this must be discussed with the Lead Nurse for Living Donation at NHSBT and approved by the Chair and/or Deputy Chair of KAG.

The option of non-simultaneous surgery can only proceed if the relevant centres agree and all donors and recipients involved give valid consent. In particular, the risks of non-proceeding transplants must be clearly explained in the consent process, in accordance with current best practice and individual circumstances (e.g. recipient sensitisation and/or additional interventions such as antibody removal).

2.1.3 Incomplete exchanges, prioritisation for transplantation

Transplant centres are responsible for reporting all cases of incomplete exchanges in the UKLKSS to NHSBT via LKDchemes@nhsbt.nhs.uk. For potential serious adverse events and serious adverse reactions, incidents must be reported via ODT on-line incident reporting so that these can be investigated and learning shared. These incidents include:

- Early death of donor or recipient (at time of surgery or within 3 months post-surgery)
- Failed retrieval or implantation of donated organ (e.g. due to damage or technical difficulty)
- Recipient misses out on a transplant whilst an exchange is in progress (either simultaneous or non-simultaneous surgery)
- Early transplant failure (implantation to 4 weeks post-transplant)
- Damage to donated organ
- Non-adherence to standard operating procedure for packaging and transportation of unaccompanied organs
- Kidney failure in the donor within 3 months of donor nephrectomy

Centres are requested to inform LKD Schemes immediately when an identified exchange has not proceeded. When a transplant does not go ahead, it is the responsibility of the transplant centre to reactivate the patient on the national transplant list.

In cases when a scheduled exchange is partially completed, if a paired donor has donated as part of the exchange and their paired recipient is left without a transplant, the recipient is given 2 options for prioritisation.

Option 1:

Prioritisation for any kidney offer, deceased or living, that is HLA and blood group compatible in accordance with the deceased donor allocation scheme¹. Patients are prioritised at the top of the Tier¹ in which they appear in the deceased donor kidney matching run, such that any higher prioritised patients receive ultimate priority. Patients have an opportunity to accept or decline any offer of a matched donor until they accept an offer. If an offer has not been accepted within 3 months of prioritisation, this will be reviewed by the transplant centre.

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Option 2:

Prioritisation for any living kidney offer (i.e. non-directed altruistic kidney donor) that is HLA and blood group compatible until such time as the patient accepts an offer. Patients are prioritised at the top of their Tier in which they appear in the kidney matching run, such that any higher prioritised patients receive ultimate priority. The patients can be registered with a preferred HLA and age match if this has previously been specified within the UKLKSS. If the prioritised patient in option 2 has not accepted any offer by the commencement of the next scheduled matching run, prioritisation continues and includes any compatible living kidneys offered at the end of an altruistic donor chain. Preferred HLA and age matching criteria remain in place.

Both options for prioritisation are offered, via the transplant team, so that patients can make an informed choice about their preferred option, tailored to their individual circumstances. There is no guarantee that prioritisation will result in a transplant in a short time frame, particularly if the recipients are sensitised. **Requests for prioritisation for transplant listing can be made via the Lead Nurse for Living Donation or Statistical Leads for Kidney Transplantation.**

If a donated kidney from either an altruistic or paired/pooled donor cannot be implanted into the intended recipient on the day of surgery, the kidney is offered through the UK kidney allocation scheme for an alternative recipient on the national transplant list.

If the kidney cannot be implanted into the intended recipient when the kidney has been dispatched to the transplant centre it will be offered to the UK transplant list for patients in Tier A only via the ODT Hub. If there are no suitable patients, the kidney can be kept by the centre to which the kidney has been dispatched. The centre will select the most appropriate patient from their local list.

If more than 3 offers from a PPD at the end of an altruistic donor chain are declined or unsuitable once a date of surgery has been scheduled, the donating centre can choose to allocate the kidney to a local recipient, to minimise disruption to the donor.

2.2 Non-directed altruistic donation

2.2.1 Altruistic Donor Chains

The default for all non-directed altruistic donors (NDAD) is inclusion in the UKLKSS quarterly matching runs unless there is a matching recipient in Tier A on the transplant list. If there is no matching high priority patient then, the donor will be registered for the next LDKMR. If a match is identified, the donation will take place as part of an altruistic donor chain in line with 2.1.2. Donor assessment and preparation for donation as per UK Guidelines and local transplant centre protocol, including mental health assessment. Kidneys from NDADs will not be offered to recipients who are older than the donor by 30 years or more.

2.2.2 Donation to the national transplant list

High priority patients for NDAD kidneys are identified from the national transplant list by performing a deceased donor matching run. NDADs donors also have the opportunity to donate directly to the national transplant list if they have registered for the UKLKSS but were not matched in the LDKMR and do not wish to wait until the next LDKMR.

Once a recipient has been identified, special considerations that are relevant to the acceptance of a donor kidney by the recipient centre are circulated by ODT to a named living donor coordinator contact, who reports the decision of the clinical team back to ODT. The recipient transplant centre, on behalf of the patient, has one working day to provisionally accept the offer. On provisional acceptance, the recipient will be suspended from the deceased donor transplant list. Compatibility is confirmed between donor and the recipient on the transplant list by performing and reporting crossmatch testing within 7-14 days.

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If more than 3 offers from a single non-directed altruistic donor are declined or unsuitable once a date of surgery has been scheduled, the donating centre can choose to allocate the kidney to a local recipient, to minimise disruption to the donor.

If a donated kidney from an altruistic donor cannot be implanted into the intended recipient on the day of surgery, the kidney is offered through the UK offering scheme for an alternative recipient on the national transplant list.

If the kidney cannot be implanted into the intended recipient when the kidney has been dispatched to the transplant centre it will be offered to the UK transplant list for patients in Tier A only via the ODT Hub. If there are no suitable patients, the kidney can be kept by the centre to which the kidney has been dispatched. The centre will select the most appropriate patient from their local list (as for 2.1.3).

Anonymity between donor and recipient is required before surgery but may be broken afterwards, if all parties agree, via the living donor coordinators after surgery. As with altruistic donor chains, kidneys from NDADs will not be offered to recipients who are older than the donor by 30 years or more.

2.2.3 Coordinating Transplants for suitable NDAD-recipient pairs

Dates of surgery are scheduled between centres. Suitable storage and transport of kidneys is arranged by the named living donor coordinator contacts at transplant centres.

If the transplant cannot proceed, depending upon the reason, the kidney could be re-allocated to a different recipient on the UK transplant list to avoid delay to the donor or, if the donor can wait, it may be possible to proceed with the same pair if the timeframe is realistic for all parties.

3. Directed altruistic donation

Directed altruistic donation (DAD) is when a person donates to a specific recipient with whom they have:

- A genetic relationship but no established emotional relationship
- No pre-existing relationship prior to the identification of the recipient's need for a transplant

Directed altruistic donors (DAD) usually donate directly to an intended recipient but they can be included within the UKLKSS as PPDs for a specific individual. Within the Human Tissue Acts, the Human Tissue Authority (HTA) can give legal approval for any living donation (including DAD cases) to proceed if the Authority is satisfied that two requirements are met:

- a) there is no evidence of coercion of the donor
- b) there is no evidence of reward for the donor

4. Direct living donation

This applies to donation of a kidney to a specific recipient including:

- genetically related donation: where the potential donor is a blood relative of the potential recipient
- emotionally related donation: where the potential donor has a relationship with the potential recipient; for example, spouse, partner, or close friend.

If a recipient within a direct living donor pair cannot be transplanted from their intended donor and the donated kidney is redirected to an alternative recipient on the waiting list and is transplanted, the recipient who has missed out on a transplant is eligible for prioritisation for transplantation in line with section 2.1.3.

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Re-direction of the donated kidney in **directed living donor cases** is by local allocation as NHSBT does not hold the necessary registration data for the donor to perform a UK wide matching run.

5. Domino Kidney

5.1 Overview

When a patient requires or requests a nephrectomy for therapeutic reasons (e.g. haematuria-loin pain syndrome) they may choose to donate that kidney to a recipient awaiting a transplant. This is known as domino donation and does not require HTA approval.

Kidneys are offered locally **first**. The donor must be recorded as a 'Domino Donor' with NHSBT to ensure that these donors are not included in the UK Living Donor Registry for the purposes of outcome monitoring and follow-up. **If there are any queries about domino donation, please contact the NHSBT Lead Nurse for Living Donation.**

Donor assessment and preparation for donation initiated as per UK Guidelines and local transplant centre protocol.

5.2 Protocol

Date of surgery scheduled according to clinical/patient need but with advance planning time if possible. If suitable to donate, the domino donor is registered with ODT, NHSBT and a local kidney matching run is performed in advance (ideally ~ 7 days prior to surgery to avoid protracted suspension from the national transplant list for recipient) by Hub Operations to identify a local recipient.

Once a recipient has been identified, special considerations relating to the donor, donor surgery and donated kidney that are relevant to the acceptance of kidney by the recipient are discussed. This includes the possibility that the transplant may not proceed if the kidney is not considered viable at retrieval.

Compatibility is confirmed between donor and recipient by performing crossmatch testing.

Suspension of the recipient from the national transplant list is advised but is at the discretion of the recipient and recipient transplant centre. Anonymity between donor and recipient is **required before surgery but may be broken afterwards, if all parties agree,** via the living donor coordinators after surgery. If the transplant cannot proceed then the recipient will be reinstated on the national transplant list immediately.

6. Previous living donors requiring a kidney transplant

6.1 Eligibility

Where a previous **living** donor requires a kidney transplant they will be offered priority for transplantation.

This policy applies to those living donors who, at the time when a transplant is required, are themselves eligible for NHS treatment. This policy does not apply to non-NHS eligible living donors who have donated to a non-NHS eligible recipient.

The donor who requires a transplant must meet the **current clinical eligibility criteria** for receipt of a transplant and be placed on the **national transplant list** by a designated transplant centre.

This policy applies to first and subsequent transplants and any other organ required following living organ donation. For example, a living liver donor who requires an emergency liver transplant as a result of vascular thrombosis of the liver remnant and subsequently develops renal failure as a consequence of immunosuppressive treatment would be eligible for priority for a renal graft.

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Transplant centres are responsible for reporting all cases of end-stage kidney disease in previous living donors to the National Transplant Database via NHSBT.

6.2 Priority for kidney allocation

The donor will be prioritised for any kidney offer, deceased or living, that is HLA and blood group compatible using the same blood group matching criteria that are applied to the deceased donor scheme.

A previous donor (recipient) awarded special prioritisation will be ranked above all other non-prioritised patients within their qualifying tier/level (Tiers A and B¹), of the deceased donor kidney matching run. Clinically urgent children and all other higher tiered patients will continue to be ranked higher than a special prioritised patient. Where two or more patients are awarded special prioritisation within the same matching run, they will be ordered first by their qualifying Tier and then by their matching run points score.

The patient would have an opportunity to accept or decline any offer of a matched donor until he/she accepts an offer. Although this system could be left open indefinitely, it is recommended that, if an offer has not been accepted within 3 months of prioritisation, this is reviewed with the transplant centre.

Requests for prioritisation for transplant listing can be made via the Lead Nurse for Living Donation and the Statistical Leads for Kidney Transplantation.

7. Death of an intended living donor

If a person who was being considered as a living kidney donor dies unexpectedly prior to the procedure being carried out, a request to donate a kidney as a deceased donor to the intended recipient should generally be allowed to proceed after their death. This is provided that it

- Is still clinically indicated for the intended recipient and that they are on the transplant waiting list or could be considered to be placed on the national transplant list in line with the patient selection policy²
- That there is consent/authorisation for donation of more than one organ.

For these purposes, evidence that there was a willingness to be a living donor can be considered to start from the point at which an individual expressed a wish to family and/or friends that they wished to be assessed as a living donor.

There may be circumstances, however, where the potential donor is not far enough into the process for there to be documentary evidence of their intent to be considered as a potential living donor. In such cases, relatives can be asked to provide confirmation of this intent. The type of confirmation to be provided is, in each case, at the discretion of those dealing with the family. All discussions and decisions must be fully documented to inform any subsequent analysis or review, particularly where a requested allocation is refused.

In some cases, a potential living donor might start workup but then be found to be unsuitable to complete the process – for example as a result of a medical condition which may be detrimental to them in later life. In such cases the requested allocation can be considered after their death providing all the principles set out in organ selection and allocation policies³.

1. Kidney Transplantation Deceased Donor Organ Allocation Policy [POL186](#).
2. Patient Selection for Deceased Donor Kidney Only Transplantation [POL184](#).
3. Introduction to Patient Selection and Organ Allocation Policies [POL200](#).

Other useful resources for living organ donation:

Further information:

www.odt.nhs.uk

<https://www.organdonation.nhs.uk/about-donation/living-donation/>

Standards and Guidelines:

<https://bts.org.uk/guidelines-standards/>

Legal framework for living organ donation:

www.hta.gov.uk