New Zealand Kidney Allocation Scheme

The New Zealand Kidney Allocation Scheme (NZKAS) has been developed to ensure that kidney allocation in NZ is performed on an equitable, accountable and transparent basis. This algorithm is used for the allocation of all deceased donor kidneys and non-directed live donors.

The Renal Transplant Subcommittee of the National Renal Advisory Board developed the algorithm (subsequent revisions undertaken by the National Renal Transplant Leadership Team (NRTLT)) to take into account factors known to affect graft survival, but also give allocation advantage to patients who wait the longest. The outcomes of the operation of the algorithm are reviewed annually and, if necessary, the weightings of different items adjusted to ensure both aims continue to be achieved. The algorithm is run at the New Zealand Blood Service Tissue Typing laboratory in Auckland. All allocations are audited.

GENERAL

All deceased donor kidneys are allocated on a NZ-wide basis.

Non-directed living donor (NDD) kidneys are allocated to recipients in the Transplant Unit at which the assessment was undertaken. Where a NDD is able to facilitate two or more transplants via a kidney exchange this will be the priority (if agreed by the donor), with the ‘out’ kidney from a chain returning to the transplant unit which has assessed the NDD, to be allocated according to the algorithm restricted to patients of that transplant unit.

The retrieval of deceased donor kidneys is coordinated by Organ Donation NZ, who are responsible for contacting transplant teams, offering of kidneys, and transport of kidneys. For donation after circulatory death (DCD) donors it is agreed that, where possible, kidneys will be allocated to two separate transplant centres to ensure lowest possible cold ischaemia time.

A decision to accept or decline a kidney offered by ODNZ is made by the transplant team. This should occur as soon as possible, and within two hours. Occasionally, for example, where the call to make the offer occurs prior to the retrieval, the two hour time frame will commence at a later time point, as agreed between the ODNZ coordinator and the renal physician receiving the offer. Renal physicians will contact the ODNZ coordinator again to accept or decline the offer. Where this has not occurred within two hours, the ODNZ coordinator will make further contact with the renal physician before offering the kidney to the next recipient’s team.

There is a separate “Protocol for Biopsy and Use of Marginal Deceased Donor Kidneys” which describes when kidneys should be biopsied and subsequently offered as dual transplants (two kidneys for one recipient) or not used.

There is no facility for urgent listing.

Waiting time points are accrued from date of activation on the list or from date of initiation of chronic dialysis, whichever is the later.
Patients who are otherwise eligible for the kidney only deceased donor waiting list may be listed preemptively (before starting maintenance dialysis, either for the first time, or after failure of a prior kidney transplant) where they meet the all of the following criteria:

1) Chronic renal failure, with estimated or measured GFR < 15 ml/min/1.73m2
2) Progressively falling eGFR, such that renal replacement therapy is estimated to be required shortly, eg within the next 6 months
3) There is no compatible directed live kidney donor who has completed assessment (does NOT include co-registered donors in the kidney exchange)

Patients who are otherwise eligible for the simultaneous pancreas and kidney deceased donor waiting list may be listed preemptively (before starting maintenance dialysis, either for the first time, or after failure of a prior kidney transplant) where they have chronic renal failure, with estimated or measured GFR < 15 ml/min/1.73m2.

Pre-emptively listed recipients accrue waiting time points only from the date of dialysis commencement (or recommencement following a failed prior transplant).

Patients who are active on the deceased donor waiting list are suspended when they have a directed live donor accepted by the transplant unit. Patients who are transplanted are removed from the deceased donor waiting list.

Where a transplanted kidney has primary non-function or very early loss (< 1 week), and after discussion and agreement by NRTLT, the recipient will be reinstated on the waiting list and will retain their original listing date.

Kidneys must be offered to recipients in order of algorithm. Where a kidney is not transplanted into a recipient, a reason must be supplied for audit. The left kidney goes to the top ranked recipient unless there is specific reason to request the right kidney, at the discretion of the transplant unit of the top ranked recipient. Kidneys will only be offered where there is a suitable cross match with no significant donor specific anti-HLA antibodies, as determined by the Medical Director.

**ALGORITHM**

**Tier 1a:** Where another life-preserving organ (heart, liver, lungs) is to be offered to a recipient a kidney will be allocated to that recipient on request of the appropriate transplant team.

**Tier 1b:** Combined kidney-pancreas transplants are allocated next.

- Only blood group identical (except A to AB).
- Date of listing.

**Tier 1c:** Where a recipient in a kidney exchange has been left without a kidney transplant due to failure of their matched donor proceeding with surgery or loss of the donated kidney prior to perfusion, AND after their exchange donor has donated (an ‘orphan recipient’), the next compatible deceased donor kidney will be offered to them (and any subsequent kidneys until one is accepted).

**Tier 1d:** Any prior live kidney donor who is blood group compatible, and where there is no clinically relevant HLA incompatibility with the available kidney in the view of the Medical Director.

**Tier 2:** The purpose of this tier is to allocate kidneys with a low number of HLA mismatches.
• Blood group identical (except A to AB), unless 0 and 1 HLA mismatch, then blood group compatible.

• All patients with 6000 points.

• HLA mismatches are calculated first (if score < 4000 recipient is excluded from further consideration on this rank, e.g. 1 DR mismatch):
  - Minus 2200 points each HLA-DR mismatch.
  - Minus 900 points each HLA-B mismatch.
  - Minus 800 points each HLA-A mismatch.

• Plus 100 points if recipient younger than 15 years.

• Waiting time:
  - Plus 1 point per month on waiting list.

• Total (ties separated by random number generation).

**Tier 3:** The purpose of this tier is to allocate kidneys to the longest waiting recipient with an acceptable degree of mismatch.

• Blood group identical, except that A kidneys can be allocated to AB recipients when there are more than 3 AB recipients on list.

• All patients with 2000 points:
  - Plus 200 points if 1 HLA DR mismatch, plus 300 points if 0 HLA DR mismatch.
  - Plus 100 points if recipient younger than 15 years.
  - Plus 3 points per month on waiting list.

• Total (ties separated by random number generation).

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National Kidney Allocation Scheme

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National Renal Transplant Service  
Chair, National Renal Transplant Leadership Team
NZ Kidney Allocation Scheme Amendment

Kidney Damaged At Retrieval

Occasionally, a kidney may be damaged during retrieval.

A kidney that is, in the opinion of the retrieving surgeon, too damaged for transplantation will be discarded (including return to the deceased donor’s body where that is appropriate). Kidneys discarded for any reason are audited by the NRTLT.

Where the retrieving surgeon is of the opinion that the damage will require significant additional steps undertaken by the transplanting surgeon beyond what would be routine, the retrieving surgeon will:

- Document the damage in the clinical record, including photographs where appropriate.
- Discuss the damage and probable surgical approach with the transplanting surgeon at the unit to which the kidney is allocated (noting that the identity of the recipient and therefore the transplant surgeon may not be known immediately).

The transplanting surgeon who is receiving the damaged kidney will:

- Ensure they are comfortable with undertaking the transplant procedure with any additional steps required.
- Discuss the nature and estimated impact of the damage on the recipient’s operation and the probability of successful transplantation with the recipient as part of the informed consent process.

If the transplanting surgeon is unable to accept the kidney for any reason, the kidney offer will be declined. The transplanting surgeon should indicate whether they are declining the kidney entirely, or only for the recipient to whom it has been allocated. This should be communicated directly to the local transplant nephrologist, who will contact the ODNZ Coordinator.

The kidney will then be offered to the next person as per the NZ NKAS (although where the kidney has been declined for any recipient at a transplant unit, patients from that unit will be omitted from subsequent allocations for the damaged kidney).

Where two kidneys are available for allocation, the highest ranked recipient is offered the left kidney first. If that kidney is not accepted for that recipient for any reason (including damage during retrieval), the right kidney should subsequently be offered to the highest ranked recipient.
## Version History

<table>
<thead>
<tr>
<th>Update number</th>
<th>Reason for update</th>
<th>Date Approved</th>
<th>Circulation Audience and Date</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Audit has shown that the number of kidneys allocated on Rank 1 has increased to about 40%; this is well over the intention of 25-30%. Modelling has suggested that modifying the algorithm to exclude HLA-DR mismatches on Rank 1 will rectify this issue.</td>
<td>2013</td>
<td></td>
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<tr>
<td>2</td>
<td>Added plan allocation NDDs to kidney exchange first priority, additional minor edits.</td>
<td>2015</td>
<td></td>
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<tr>
<td>3</td>
<td>Added plan for ‘orphan recipient’ from kidney exchange. Ranking numbering extended to manual override categories (now ‘Rank 1’) and lower ranks renumbered.</td>
<td>November 2016</td>
<td></td>
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<tr>
<td>4</td>
<td>Amendment inserted.</td>
<td>September 2017</td>
<td></td>
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<tr>
<td>5</td>
<td>Added rank 1d: prior live kidney donor.</td>
<td>December 2017</td>
<td></td>
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<tr>
<td>6</td>
<td>For donation after circulatory death (DCD) donors it is agreed that, where possible, kidneys will be allocated to two separate transplant centres to ensure lowest possible cold ischaemia time. (Deleted directive that “one kidney must be allocated to the regional transplant centre”).</td>
<td>September 2018</td>
<td></td>
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<tr>
<td>7</td>
<td>Paragraph about allocation time allowance.</td>
<td>February 2019</td>
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<td></td>
<td>Preemptive Listing Criteria updated.</td>
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<td>Suspension from waiting list after live donor accepted.</td>
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<tr>
<td></td>
<td>Minor edits.</td>
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<tr>
<td>8</td>
<td>Preemptive simultaneous pancreas and kidney listing.</td>
<td>December 2019</td>
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<td>Circulation audience and date to version history.</td>
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<tr>
<td></td>
<td>Reference to biopsy protocol document.</td>
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<tr>
<td></td>
<td>“Rank” replaced with “Tier”</td>
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