

Australian and New Zealand Paired Kidney Exchange Program

Protocol 6: Guidelines for Packaging and Transport



Guidelines for Packaging and Transport

Introduction

The Australian and New Zealand Paired Kidney Exchange (ANZKX) Program is a collaborative trans-Tasman live kidney donor program involving transplanting centres in Australia and New Zealand. The goal of the ANZKX is to increase live kidney donor transplants by identifying matches for incompatible donor-recipient pairs, and under certain conditions, compatible pairs.

Compliance with the ANZKX protocols with consistency across all centres is essential for the ongoing success of the Program.

For the purpose of recruiting and assessing donor-recipient pairs, transplant centres across Australia and New Zealand have been identified to fulfil essential criteria to participate in ANZKX.

The purpose of this document is to inform **transplant centres performing donor nephrectomies** of the Organ Packaging and Transport Protocol for the ANZKX Program. This Protocol must be followed by participating transplant centres in order to maintain optimal organ quality and recipient outcomes. The ANZKX Coordination Centre's role is to assist transplant centres with the coordination of the exchange process and provide logistical support.

1. Packaging and transport – General principles

1.1 Process

Under the ANZKX Program live donor kidney procedures will most often occur at the donor's transplant centre and the kidney will then be transported to the recipient's transplant centre.

The choice of surgical technique used for the donor nephrectomy will be that which is ordinarily used at the donor hospital. Prior to confirmation of a potential exchange occurring, the kidney transplant donor and recipient surgeons are required to complete the ANZKX Surgical Check List. Direct communication between the donor and recipient surgeon is encouraged if there are any issues regarding anatomy, preferred side of nephrectomy or other surgical issues. After formal cross-matching and confirmation of surgical approval by transplant surgeons, the ANZKX Coordination Centre will confirm a mutually agreeable date for the donor-recipient transplant procedures with respective transplant centres.

Approximately two weeks prior to surgery, the ANZKX Coordination Centre will send information to participating units confirming surgical date, donor anaesthetic start time, side of donor nephrectomy and perfusion solution. **The information, including the documented side of nephrectomy, should be double checked by donor and recipient surgeons at this time.**

A final logistics plan and supporting documentation is sent by the ANZKX Coordination Centre to participating units approximately 5 days prior to surgery.

In most circumstances the donor procedures will commence at the same time at the two or more transplant centres when a chain involves Australian centres only. However if a chain involves centres both in Australia and New Zealand, non-simultaneous start time for the donor procedure may be required

1.2 Transportation of Kidneys

In the ANZKX Program, kidneys will be transported between the donor and recipient transplant hospitals.

Designated ANZKX transport boxes and labels (ANZKX Transport Pack) will be supplied to each transplant centre. Distribution of ANZKX Transport Packs to all donor and recipient participating centres will occur prior to the first and subsequent exchange surgeries for transplant centres.



At least two weeks prior to each exchange, the ANZKX Coordination Centre and transplant centres will ensure that an ANZKX Transport Pack is available for transportation of the kidney. Further supplies to replenish stock will be provided on request over the duration of the ANZKX Program. A transport courier will be used to transport all kidneys between transplant hospitals. The courier will provide comprehensive door to door service. Funding for courier services will be the responsibility of the Organ and Tissue Authority.

1.3 Preservation of the Donor Kidney

There is no single mandatory perfusion solution to be used for the transport of kidneys within the ANZKX Program for exchanges involving either the Australian eastern states (Queensland, New South Wales and Victoria) or within New Zealand. In these cases the final choice of perfusion solution will be negotiated between donor and recipient surgeon at the time of completion of the donor Surgical Checklist.

However for exchanges involving other states (for example between Victoria, New South Wales or Queensland and either South Australia or Queensland) or between Australia and New Zealand, where a longer cold ischaemic time is anticipated, UW solution is preferred.

The addition of heparin to the perfusion solution is not mandatory but can be requested by the donor or recipient surgeons via the surgical checklist.

The protocol/method for perfusion is documented in 5.1 below. However it should be noted that dissection of the donor vessels in the hilum of the kidney on the back table will not be undertaken by the donor surgeon. This will be the responsibility of the recipient transplant surgeon. However, the donor surgeon will ensure completeness of the perfusion of the kidney by external examination of the parenchyma. To enable assessment of complete perfusion of the kidney, the donor surgeon will remove sufficient peri-renal fat tissue, but will not dissect donor vessels.

Post nephrectomy, the donor surgeon should call the recipient surgeon. This should be done each time but is particularly important if there are any anatomical issues that may be of concern. Information on any significant technical or anatomical problem is also to be documented on the Living Kidney Donation report by the donor surgeon.

1.4 Packaging of the Donor Kidney

Packaging of the kidney for transportation will be as for deceased donor kidneys. Specifically, the kidney is placed in three thick sterile plastic bags (e.g. bowel bags). The inner bag will contain the donor kidney and approximately 500ml of perfusion solution. The middle bag will contain 300 to 500ml of sterile cold saline or ice. The outer bag will contain only the two inner bags. No solution is required in the outer bag.

Cold storage for transportation will be provided by a transportable single-use box (filled with non-sterile wet ice) which is supplied to each transplant centre at least two weeks prior to the date of surgery.

The box must be placed in the transport bag provided. The transport bag will be used by all transplant centres. It will allow the kidney box to be more easily manoeuvred, is already screen printed with some relevant labelling and contains a dedicated sleeve for address labels and documentation to travel with the organ.

The Living Kidney Donation Report will be forwarded with the donor kidney. This document has de-identified donor and recipient details, with sections to be completed by donor and recipient centres.

De-identified Donor NAT, Blood Group, CMV/EBV results and Donor blood samples will also accompany the kidney. These documents and blood samples will be placed in the ANZKX Exchange Details envelope provided and inserted in the internal sleeve of the dual-compartment document sleeve located on the inside lid of the transport bag.

1.5 ANZKX Labelling

The transport bag has been printed with ANZKX logo. Specific address labels marked "Urgent Delivery" will be provided by the ANZKX Coordination Centre identifying the bag's contents and destination, with the



contact details of the sending and receiving renal transplant coordinators. The Urgent Delivery Label with Human Organ for Transplant is only for exchanges within Australia. The “Urgent Delivery” label is placed in the top sleeve of the dual compartment that is located on the inside lid of the transport bag, so the label is visible from the top of the bag when closed. Transplant centres should also complete the “Exchange Details” envelope label, place the ANZKX Living Kidney Donation report, Hepatitis B and C and HIV NAT, ABO blood group, CMV/EBV results and donor blood samples in the envelope and insert the envelope into the sleeve that is located on the inside lid of the transport bag.

1.6 Transport Carrier

Transportation of the live donor kidney will be organised by the ANZKX Program Coordinator in close collaboration with renal transplant coordinators at the relevant transplant centres. The procedure will be fully coordinated in discussion with the transplant centres involved.

All kidneys will be transported by a transport courier which will undertake door to door delivery by the fastest possible means and to a designated person (e.g. the renal transplant coordinator) at the recipient transplant centre. The renal transplant coordinator, surgeon or delegate will also be responsible for verifying the kidney delivered is the correct one for the recipient, and all documentation is attached and complete. Transport costs will be funded in Australia and New Zealand as per agreed funding arrangements.

2. Packaging resources

An ANZKX Transport Pack including a single use transport box and other transport items will be supplied to the transplant centre. There are different single use transport boxes used for exchanges within Australia and trans-Tasman exchanges. The packs are to be designated for ANZKX use only and kept in a safe and accessible area, e.g. the renal transplant coordinator's office. After each exchange, the ANZKX Coordination Centre will replenish stock of transport packs as required upon advisement from the local transplant centre, to ensure readiness for the next exchange. Please note the transport bags are multiple use items, and as such, should be retrieved from theatres at the completion of surgery.

The ANZKX transport pack will contain the following items:

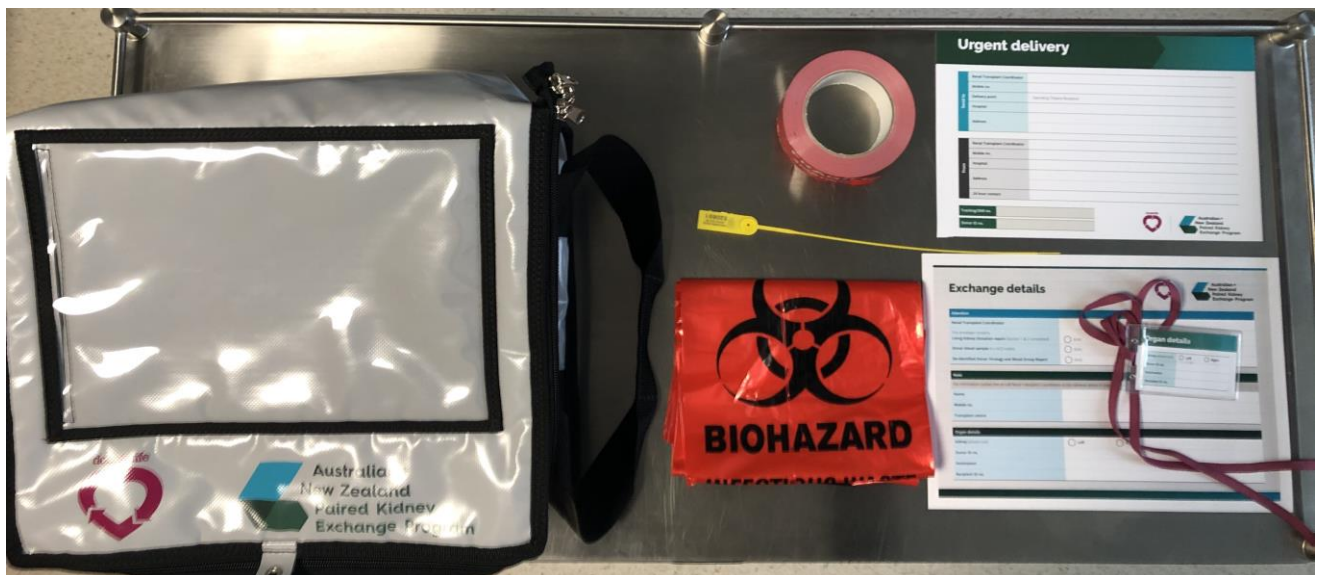
- Transport Bag
- Single use box
- Heavy duty clear plastic bag for lining box (Exchanges within Australia)
- 2X red biohazard bags (trans-Tasman Exchanges)
- Clear plastic insert tag with loop for labelling of sealed kidney bag
- Transport tape to seal the box.
- ANZKX Organ Transport Envelope and Label
- Cable tie to seal the transport bag (Security cable tie for trans-Tasman)

Standard packaging supplies to be provided by the transplant centre are as follows:

- Preserving fluid – 1L solution x 2 bags
- Heparin
- Bowel bags x 3
- Non-sterile crushed ice
- Sterile cold saline



1. For Exchanges within Australia (see above)



2. For Trans-Tasman Exchanges Between Australia & New Zealand (see above)

3. Pre-exchange process

3.1 ANZKX Program Coordinator

- Notify transplant teams of the live donor/recipient pairs confirmed for an exchange.
- Coordinate date of transplants acceptable to centres and donor/recipient pairs.
- Identify responsible renal transplant coordinator at each site that will oversee coordination of surgical timelines.
- Identify the transplant recipient surgeon on site (if applicable) who will assist with donor kidney packaging.
- Obtain logistical and operative details pertaining to the day of exchange (refer Day of Exchange Details form)

3.2 Local Transplant Centre

- Obtain consent from donor and recipient for the actual surgery as per hospital policy.
- Ensure ANZKX transport box and contents are available.
- Check surgical schedules (date & time) are in place.
- Donor NAT has been performed according to ANZKX protocol.
- De-identified Donor NAT, ABO and CMV/EBV results are available.

3.3 ANZKX Program Coordinator Confirms

7-2 days prior to surgery

- Renal transplant coordinators who will be present at kidney retrieval and implant.
- ANZKX transport packs have been received by each centre and are ready for use.
- Anaesthetic start times and anticipated pick-up time for organs.
- Donor Blood Request Forms for “PKE-Store Cells” have been received by centres
- Name of recipient transplant surgeon who will be present in theatre to assist with packaging (if applicable).
- Flight itinerary for organs (as applicable).
- Consignment Notes for Organ Transport have been received by centres
- Couriers responsible for pickup and delivery.
- Hospital pickup and delivery points and designated contacts at each hospital.
- Contingency plan and emergency contact details.

1 day prior to surgery

- All the above is in place.
- Donor/recipient pairs are fit for surgery (not affected by acute illness, consent not withdrawn).

4. Day of exchange process – Local renal transplant coordinators

4.1 Kidney Retrieval

Designated renal transplant coordinators (or delegates) at each transplant centre will be present in the operating theatre and responsible for the following duties:

i. Donor Blood Sample Collection

- Donor blood samples (4 x ACD tubes for PKE –Store Cells) are required from the donor and are to be sent with the kidney to the recipient transplant centre. These blood samples are necessary in the unlikely event of an “orphan kidney”

ii. Communication

- Relay the following information via telephone call to the ANZKX Coordination Centre as required:
 - Anaesthetic start time – telephone hook up with the ANZKX Coordination Centre and other donor centre(s) to check readiness and synchronised start (if appropriate).
 - Any delay in scheduled anaesthetic start time
 - Time of anaesthetic induction

- Time of knife to skin
- Time of cross clamp of donor kidney
- Time of departure of kidney

The ANZKX Coordination Centre must be immediately notified if:

- The donor becomes acutely ill at any stage and surgery must be aborted
- The kidney may be removed earlier than expected
- There are surgical issues that may impact on kidney suitability or readiness for transport
- Kidney removed is visibly damaged
- Delayed or non-arrival of courier

iii. Documentation

Ensure the donor documentation is completed appropriately and accompanies the kidney.

Living Kidney Donation Report – Sections 1 & 2

Form 15			
ANZKX Living Kidney Donation Report			
Please complete this form and fax to the ANZKX Program Coordinator on +61 3 9342 7352 or email emma.vanhardeveld@mh.org.au			
SECTION 1: Completed by the Renal Transplant Coordinator or Surgeon present at retrieval and forwarded with donor kidney			
Date of Retrieval		Donor Initials	
		National Reference Number	
Donor Hospital		Donor Blood Group	
Donor Surgeon		Donor Date of Birth	
Time of Artery cross-clamp		Renal Transplant Coordinator	
Left or Right Kidney		Time Kidney on ice	
No. of arteries		Perfusion fluid / Heparinisation used	<input type="checkbox"/> Soltran <input type="checkbox"/> UW <input type="checkbox"/> (specify) <input type="checkbox"/> 10000u <input type="checkbox"/> 20000u <input type="checkbox"/> None
SECTION 2: Completed by the donor surgery team			
Abnormal findings or damage (short vein/ureter etc.)? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Comments:			
Kidney checked for complete perfusion (<i>external examination of parenchyma</i>) <input type="checkbox"/> Yes			
Recipient surgeon telephoned post-nephrectomy and advised re any issues <input type="checkbox"/> Yes			
Donor Surgeon signature			
Transplant Surgeon signature (<i>only if donor surgeon is not a credentialed transplant surgeon</i>)			

iv. Packaging and transport of kidneys

- Correct packaging of kidney
- Address label and “Exchange Details” envelope label completed and the following have been inserted in the envelope:
 - Donor blood samples (4xACD tubes)
 - Completed LKD form



- De-identified donor NAT, Blood group and CMV/EBV results
- The envelope is then inserted into the document sleeve on the inside lid of the transport bag
- Delivery of the transport box to an awaiting courier

Refer to section 6 for a detailed description of packaging requirements.

4.2 Kidney Delivery

- 1 Meet courier at designated hospital delivery point - operating theatres reception for example.
- 2 Ensure incoming Living Kidney Donation Report, Sections 1 & 2 are complete. If not, contact renal transplant coordinator at retrieval centre for details, prior to delivering kidney to theatre.
- 3 Kidney is checked and verified with implanting surgeon or delegate as correct for the intended recipient.
- 4 At end of procedure, ensure **Section 3** of the Living Kidney Donation Report has been completed by surgical team.

SECTION 3: Completed by the Transplanting Surgical team and forwarded to ANZKX Program Coordinator within 2 working days of procedure (to above fax number)			
Date of Transplant		Recipient Initials	
Recipient Hospital		National Reference Number	
		Recipient Blood Group	
		Recipient Date of Birth	
Transplanting Surgeon		Kidney Side	
Time Kidney off ice		Time of Reperfusion	
No Problems Identified <input type="checkbox"/>			
Problems Identified <i>(Please complete if problems were identified)</i>			
3.1 Inadequate Paperwork	<i>(Please circle)</i> Labelling / donor documentation / recipient documentation		
3.2 Packaging / Transportation	✓	3.3 Technical / Anatomical Problems	✓
3.2.1 Insufficient preservation fluid in bags		3.3.1 Peri-nephric fat not removed adequately	
3.2.3 Damaged container		3.3.2 Incomplete perfusion of kidney	
3.2.3 Other, incl. delays (please specify)		3.3.3 Damaged artery(s)	
		3.3.4 Damaged vein	
		3.3.5 Damaged ureter / insufficient length	
		3.3.6 Non identified abnormal anatomy	
		3.3.7 Non identified pathology	
		3.3.8 Other (please specify)	
Please indicate specific problems and provide diagram if appropriate			

- 5 Fax or scan and email Living Kidney Donation Report to ANZKX Coordination Centre within 2 working days of the procedure.

The ANZKX Coordination Centre must be immediately notified if:

- The recipient becomes acutely ill at any stage and surgery must be aborted
- Wrong kidney is delivered
- Kidney not received by the expected time
- Transport box damaged and/or packaging inappropriate
- Kidney looks visibly damaged when removed from packaging

5. Perfusion and packaging of kidney

The donor surgeon or assisting surgeon is responsible for perfusion (*refer to section 2.3*) and packaging of the kidney as described in the following steps.

A transplant surgeon is to be present in theatre to assist with packaging of the donor kidney in centres where Urologists not usually involved in deceased donor transplantation (and therefore not familiar with packaging) will perform the donor nephrectomy.

5.1 Kidney Perfusion

- 1 Donor kidney is flushed at 100cm H₂O pressure with at least 500ml of perfusion solution (refrigerator temperature = 4 degrees if UW solution is used) until venous effluent is clear of blood. The final flush will be performed with either no heparin, 10,000 or 20,000U heparin per litre of perfusate, as previously determined by the recipient surgeon.
- 2 Donor surgeon will ensure completeness of perfusion by external examination of the parenchyma.

Please note any preparation of donor kidney vessels will be the responsibility of the recipient surgeon and is not to be undertaken by the donor surgeon.

5.2 Kidney Packaging

Please note: Steps 1 – 3 are performed as a sterile procedure by the donor surgeon or assistant. 3 bowel bags and perfusion fluid are required.

- 1 First bowel bag (inner bag) – kidney in 500ml preserving fluid. (**NO ICE AS PER BELOW**)



- 2 Inner bag placed in 2nd bowel bag (middle bag) containing 300-500ml cold sterile normal saline solution or ice.
- 3 Middle bag placed in 3rd bowel bag (outer bag). No solution is required between 2nd and 3rd bag.

- 4 Completed 'Organ Details' label is inserted into clear plastic tag and tied around the neck of the sealed outer bag as per below.



- 5 Transport box is lined with a heavy duty plastic bag and 2/3 filled with crushed ice. Sealed kidney is placed upon the ice in the centre of the box, with label facing upwards. Ice is then placed around the kidney, leaving the label uppermost and visible, and ensuring the kidney is stable and no ice covers the label.



Australian Transport Box (see above)

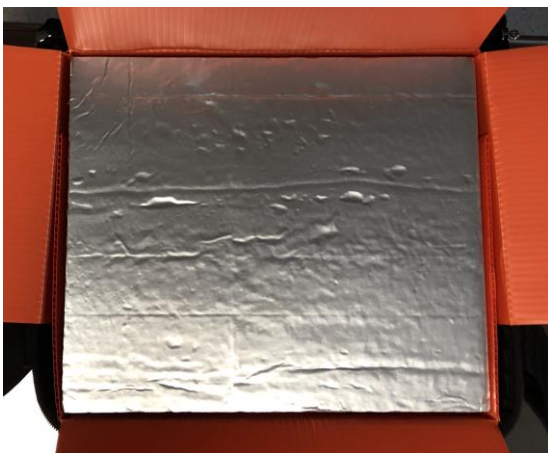


Trans-Tasman Transport Box (see above)

- 6 The neck of the plastic liner bag is secured with any remaining ties from the bowel bags. The organ and ice should be completely enclosed within the plastic liner. Then seal the box with transport tape. See images below.

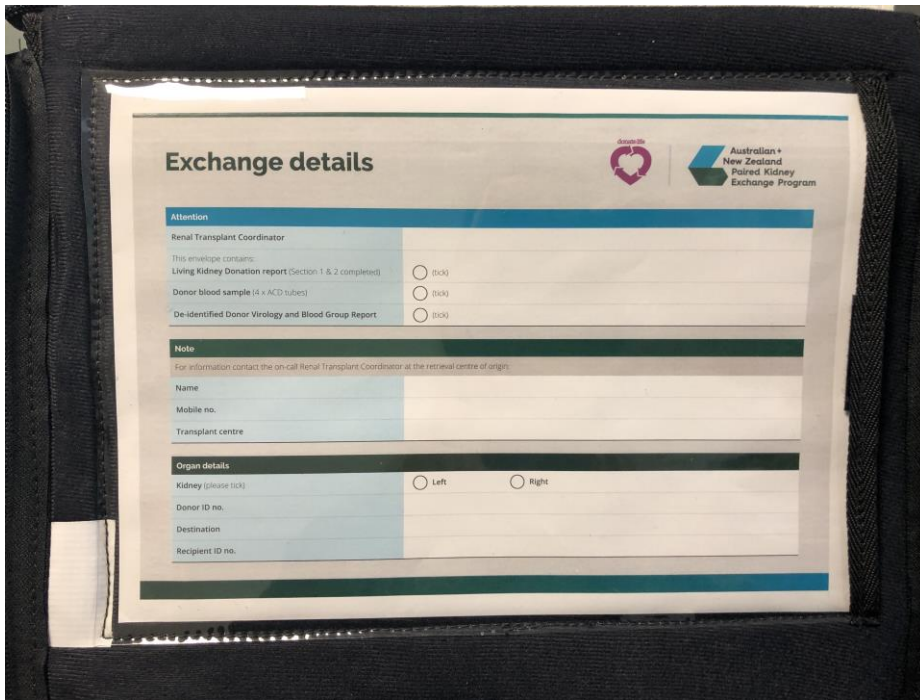


Australian Transport Box (see above)



Trans-Tasman Transport Box (see above)

- 7 Completed Living Kidney Donation Form and de-identified NAT results, ABO blood group and CMV/EBV results are placed in ANZKX envelope, and inserted into the designated section located on the underside of the top/lid of the transport bag. The donor blood samples (4x ACD tubes) and blood request form are placed in the specimen bag, and are also included with the LKD form in the ANZKX envelope.



- 8 ANZKX labels with destination details and contact numbers of both sending and receiving renal transplant coordinators are inserted into the designated section on the top/lid of the transport bag.



Australian Transport Box Label (see above)



Trans-Tasman Transport Box Label (see above)

- 9 Zip the bag closed and bring the zipper pull tags to the front in line with the eyelets and secure with the cable tie. Security cable ties are only used for trans-Tasman exchanges. The security code number should be documented on the Urgent delivery label. The courier/transport connote is then to be inserted in the clear pocket sleeve at the front end of the transport bag, below the cable-tied zippers.



Australian Transport Box White Cable-tie (see above)



Trans-Tasman Transport Box **Yellow** Cable-tie (see above)

5. Post-exchange

The Living Kidney Donation Report must be returned to the ANZKX Coordination Centre within 2 working days of the procedure. This document will contribute to monitoring of the ANZKX Program and will assist in identifying opportunities for improvements to the packaging and transport procedures.

The ANZKX Program Coordinator will collect data on the outcome of the transplants and the logistical processes undertaken and report any issues to the Authority and relevant transplant centres.

VERSION CONTROL			
Version	Date	Author	Comments
V 1.0	Jul 2019	ANZKX Team	AKX transitioned to ANZKX
V 1.0	Feb 2021	ANZKX Team	Reviewed no changes
V 1.0	Nov 2021	ANZKX Team	Reviewed no changes

