

INTRODUCTION

ANZDATA Registry 46th Report Annual Report 2023

Data to 31 December 2022

Australia and New Zealand Dialysis and transplant (ANZDATA) Registry

South Australia Health and Medical Research Institute, Level 4 South
PO Box 11060
North Terrace
Adelaide, South Australia, 5001

Phone: +61 8 8128 4758

Fax: +61 8 8128 4769

Email: anzdata@anzdata.org.au

Web: www.anzdata.org.au

CONTENTS

Acknowledgements	3
Preface	4
Editorial Board	5
ANZDATA Staff, Contributing Committee and Working Group Members	6
ANZDATA Staff & Contributing Committee Members	6
Working Group Members	7
Guidelines for Data Release	9
Attribution of Publications	10
Suggested Citation	10
Requests of Additional Data	10
Definitions and Methods	11
Contributing Units Across Australia & New Zealand	14
Chapter Contents Pages	16
Data Collection Forms	22

ACKNOWLEDGEMENTS

ANZDATA Registry offers its most grateful appreciation to everyone who helped make this 46th Annual Report possible, especially the people living with kidney failure whose willingness to share their data helps us better understand and improve the outcomes of kidney replacement therapy in Australia and Aotearoa New Zealand. The Registry wishes to thank the staff of all the Renal Units and Tissue Typing Laboratories, upon whose reporting of data this enterprise ultimately depends.

FUNDING

ANZDATA Registry is funded by:

Australian Organ and Tissue
Authority Australia



Australian Government
Organ and Tissue Authority

New Zealand Ministry of Health



Kidney Health



SUPPORTED BY

ANZDATA Registry is supported by:

Astellas Pharma Australasia Pty Ltd
Unrestricted Research Grant



Baxter Healthcare
via Investigator Initiated Research Grant



Printed in Adelaide, South Australia, 2024
© Copyright 2023 by the ANZDATA Registry
ISSN 1329-2870

[BACK TO CONTENTS](#)

PREFACE

The ANZDATA Registry has great pleasure in presenting the 2023 Annual Report, covering data collected to the 31st of December 2022.

The material contained in this report reflects enormous time and effort from a large number of people. Clinical and administrative staff throughout renal units in Australia and New Zealand have spent time collecting and contributing information, despite increasingly onerous clinical responsibilities.

The report itself contains a wide variety of information but is only a small proportion of the output of the registry. A large number of analyses are performed for other purposes, including requests from individual contributors, health departments and hospitals. The data from ANZDATA is used in safety and quality reports, health service planning and clinical research. Many of these reports can be accessed through our website (<https://www.anzdata.org.au/anzdata/publications/>).

In addition, research activities (funded by NHMRC and other sources) continue to steadily grow. Registry based trials continue to expand. The SWIFT study (examining the effect of symptom reporting on quality of life among satellite hemodialysis patients) is well underway, as are TEACH-PD (examining the effect of standardized training on PD outcomes) and RESOLVE (high vs low dialysate sodium) continue.

Co-located with the ANZDATA registry are several other registries: The Australia and New Zealand Organ Donation Registry, The Australia and New Zealand Living Kidney Donor Registry and The National Indigenous Kidney Transplant Taskforce.

We are grateful to the funders of the registry: the Australian Organ and Tissue Authority, the New Zealand Government and Kidney Health Australia. We also acknowledge support from industry - an Investigator Initiated Grant from Baxter and contributions from Astellas.

In 2023, the Australian New Zealand Society of Nephrology also provided funding to support the epidemiology fellow position. This position will provide support for advanced trainees in nephrology, and the dialysis capacity survey (separately published).

Preparation of the report has been overseen by an editorial board led by Dr Philip Clayton.

The Registry operations are overseen by an executive committee. Registry operations are supported by the ANZDATA Advisory Committee (chaired by A/Prof Nick Gray), and a wide range of working groups. All these roles are honorary and are an important part of the network of links between ANZDATA and the nephrology community.

Consumer input also grows steadily, and in 2023 ANZDATA expanded input with a formally established Consumer Board led by Steven Shirley and Luca Torrisi.

Finally, we would like to thank the Registry Staff, led by Ms Kylie Hurst who continue to rise to the challenges of increasing complexity and workload.

Stephen McDonald
Philip Clayton
Georgina Irish

EDITORIAL BOARD

- Philip Clayton - Chair
- Georgina Irish
- Eric Au
- Christopher Davies
- Kylie Hurst
- Samantha Bateman
- Jenny Chen
- Darren Lee
- Sradha Kotwal
- Hugh McCarthy
- Solomon Menahem
- William Mulley
- Matthew Roberts
- Tina Sun

For individual chapter authors, please refer to the respective chapters.

ANZDATA STAFF, CONTRIBUTING COMMITTEE AND WORKING GROUP MEMBERS

ANZDATA STAFF & CONTRIBUTING COMMITTEE MEMBERS

Executive Committee	
Members Names	Position
Stephen McDonald	Executive Officer
Philip Clayton	Deputy Executive Officer & Editor
Nick Gray	Chair Advisory Committee
Sradha Kotwal	Deputy Chair Advisory Committee
Alan Cass	Previous Chair Advisory Committee
Kylie Hurst	ANZDATA Registry General Manager
Kelly Marshall	Deputy General Manager
Georgina Irish	ANZDATA Epidemiology Fellow (Jan-Mar)
Eric Au	ANZDATA Epidemiology Fellow (Apr-Dec)

Biostatisticians	
Members Names	Position
Dr Christopher Davies	Lead Biostatistician
Ms Feruza Kholmurodova	Biostatistician

Administrative Staff	
Members Names	Position
Ms Mandy Farmer	Project Manager
Mr Paul Young	Data Systems Manager
Ms Brooke Cunningham	Project Support Officer
Ms Zoe Harker	Project Support Officer
Ms Danny Moody	Administration Assistant
Ms Alice Farmer	Data Entry Assistant
Ms Tara Hurst	Data Entry Administrative Assistant

Advisory Committee	
Members Names	Position
Nicholas Gray	Chair of Advisory
Sradha Kaotwal	Deputy Chair of Advisory & COVID WG Co-convenor
Stephen McDonald	Executive Officer
Philip Clayton	Deputy Executive Officer & Editor
Kylie Hurst	Registry General Manager
Breony Robson	Kidney Health Australia Representative
David Johnson	ANZSN Representative
Terry Jennings	RSA Representative
Rachel Morton	Patient Reported Outcomes WG Convenor
Matthew Roberts	Haemodialysis WG Convenor
William Mulley	Transplant WG Convenor
Jenny Chen	Peritoneal Dialysis WG Convenor
Solomon Menahem	COVID WG Co-convenor
Tina Sun	New Zealand Aotearoa WG Convenor
Samantha Bateman	Aboriginal & Torres Strait Island Health WG Co-convenor
Beanna Solomon	Aboriginal & Torres Strait Island Health WG Co-convenor
Hugh McCarthy	Paediatric WG Convenor
Shilpa Jesudason	Parenthood WG Convenor
Jacqueline Soraru	Genetics Special Interest Group Convenor
Josephine Chow	General Member
Revathy Manickavasagar	General Member
Michael Garrett	General Member
Helen Eddington	General Member

WORKING GROUP MEMBERS

Member Names	Position
Haemodialysis Working Group	
Matthew Roberts	Convenor
Leanne Brown	Member
Rathika Krishnasamy	Member
Kevan Polkinghorne	Member
David Semple	Member
Nigel Toussaint	Member
Emily See	Member
Jayson Catiwa	Member
Lukas Kairaitis	Member
Andera Viecelli	Member
Su Jen Chua	Member (Adv. Trainee)
Eric Au	ANZDATA Epidemiology Fellow
Aboriginal & Torres Strait Islander Health Working Group	
Samantha Bateman	Co-convenor
Breanna Solomon	Co-convenor
Paul Lawton	Member
Mark Tiong	Member
Elisa Bongetti	Member
Scott Jones	Member
Tahnee Grigson	Member
Brett Mooney	Member
Alexandra (Malu) Warrior	Member
Amy Atkinson	Member
Kelli Owen	Member (Consumer Rep.)
Eric Au	ANZDATA Epidemiology Fellow
Aotearoa New Zealand Working Group	
Tina Sun	Convenor
Lai Chan	Member
Scott Crawford	Member
Katherine Richards	Member
Andrew Henderson	Member
Natasha Houghton	Member
Tze Goh	Member
Eric Au	ANZDATA Epidemiology Fellow

Member Names	Position
Paediatric Working Group	
Hugh McCarthy	Convenor
Anne Durkan	Member
Sean Kennedy	Member
Swasti Chaturvedi	Member
Chanel Prestidge	Member
Dee Hahn	Member
Anita Van Zwieten	Member
Amelia Le Page	Member
Nick Selvathesan	Member
Eric Au	ANZDATA Epidemiology Fellow
Peritoneal Dialysis Working Group	
Jenny Chen	Convenor
Neil Boudville	Member
Monique Borlace	Member
Ashik Hayat	Member
David Johnson	Member
Kamal Sud	Member
Melinda Tomlins	Member
Katrina Chau	Member
Arunima Jain	Member (Adv. Trainee)
Eric Au	ANZDATA Epidemiology Fellow
Patient Reported Outcome Measures Working Group	
Rachael Morton	Convenor
Neil Boudville	Member
Stephen McDonald	Member
Rachael Walker	Member
Suetonia Palmer	Member
Jessica Roydhouse	Member
Rajesh Raj	Member
Andrew Salmon	Member
Allison Tong	Member
Lavern Greenham	Member
Sadia Jahan	Member
Matthew Anderson	Member
Jo Denvir	Member (Consumer Rep.)
Eric Au	ANZDATA Epidemiology Fellow

WORKING GROUP MEMBERS

Member Names	Position
Transplant Working Group	
Bill Mulley	Convenor
Phil Clayton	Member
Michael Collins	Member
Peter Hughes	Member
Darren Lee	Member
Helen Pilmore	Member
Melanie Wyld	Member
Georgina Irish	Member
Henry Pleass	Member
Ayla Woods	Member
Eric Au	ANZDATA Epidemiology Fellow
Craig Coorey	Member (Adv. Trainee)
Prasad Ravi	Member (Adv. Trainee)
Parenthood Working Group	
Shilpa Jesudason	Co-convenor
Erandi Hewawasam	Co-convenor
Rhea Danner	Member
Nishanta Tangirala	Member
Melanie Wyld	Member
Angela Makris	Member
Renuka Shanmugalingam	Member
Erin Vaughan	Member
Arunima Jain	Member
Su Jen Chau	Member (Adv. Trainee)
Brooke Huuskes	Member (Consumer Rep.)
Amanda Sluiter	Member (Consumer Rep.)
Eric Au	ANZDATA Epidemiology Fellow

Member Names	Position
COVID-19 Working Group	
Solomon Menahem	Co-convenor
Sradha Kotwal	Co-convenor
Kevan Polkinghorne	Member
Andrew Pilmore	Member
Daniela Potter	Member
Hemant Kulkarni	Member
Matthew Roberts	Member
Peter Kolovos	Member
Subi Thomas	Member
Claire Dendle	Member
Eric Au	ANZDATA Epidemiology Fellow
Special Interest Group Genetics	
Jacqueline Soraru	Convenor
Amali Mallawaarachichi	Member
Andrew Mallett	Member
Hugh McCarthy	Member
Georgina Irish	Member
Eric Au	ANZDATA Epidemiology Fellow

GUIDELINES FOR DATA RELEASE

In 2017 ANZDATA undertook an extensive review and revision of its policies and procedures, including those related to data release. These procedures continue to evolve. The latest versions of these policies and procedures are available at our website: <https://www.anzdata.org.au/anzdata/services/data-policies/>

The following are our current data release principles. Please see our website for more information on how to request data from ANZDATA.

Encourage data use

- Data extracts will be made available to contributors of ANZDATA on request, provided evidence of appropriate expertise for analysis/interpretation is shown by the requestor.

Encourage efficiency

- Where adequate for a project, release of aggregate data (group level), is preferred to the release of individual line data.
- Only data fields required for analysis of the issues / questions identified in any given request will be released.

Protect data integrity

- Data sets released are only approved for use in the specified project, subsequent use for other projects will require further approval in consultation with the registry.
- Where individual line datasets are provided, responsibility for design, conduct and interpretation of analyses lies with the requestor. A disclaimer should be included in any publications arising from these data sets.
- Details of the database structure are available in the data set specification documents and ANZDATA are available to explain the structure of the data set.
- Although much effort is put into collecting and recording data accurately, as in any large database, there may be occasional errors, for which ANZDATA does not take responsibility.

Transparency

- ANZDATA will keep and show on its website a list of the data requests (the name of the requestor and the title).
- Where a subsequent request is received for a similar or overlapping area we will endeavour to identify requestors with similar or overlapping proposals, but cannot guarantee to do so.
- Where there are overlapping requests, data will not be released for the subsequent request within 6 months of provision of data for the original request.

Prioritize contributors and funders

- Priority for data access is given to ANZDATA contributors and funders. Where requests are received from external parties, collaboration with a contributor is strongly encouraged.

- Identification of a local contributor is essential for release of identified individual line datasets – this person then acts as the “guarantor” of appropriate use and interpretation of the data and analyses.
- For release of New Zealand individual line datasets, involvement of a New Zealand ANZDATA contributor is highly desirable and consultation with Māori may be appropriate.
- Individual line data will not be released to corporations. Where requests are received, these analyses are performed “in-house”. These are generally performed on a cost recovery basis, taking into account other contributions to the Registry.

Ensure ethical research practices

- The requirement for ethics committee approval depends on the nature of the project. For many clinical audits this may not be required, but is appropriate for research studies.
- Formal ethics approval and oversight is mandatory for data linkage studies.
- Where the need for ethics oversight is unclear, the requestor will be asked to seek advice from their local health research ethics committees, external to ANZDATA.

Recognise custodianship of linked data from external sources, and other modes of data collection

- Australian transplant waiting list and some other transplant data are supplied by OrganMatch Service. Approval for use of this data outside the terms stipulated in the joint memorandum of understanding is required from OrganMatch, in addition to ANZDATA.
- New Zealand transplant waiting list and some other transplant data are supplied by the New Zealand Blood Service (NZBS). Approval for use of this data outside the terms stipulated in the joint memorandum of understanding is required from the New Zealand Transplant Leadership Team, in addition to ANZDATA.
- Data arising from specifically funded projects (including trial datasets and Sharesource linked PD datasets) is only available subject to approval by the named investigators.

ATTRIBUTION OF PUBLICATIONS

Where a member of a participating unit has analysed data provided by ANZDATA and subsequently prepared a manuscript, then “ANZDATA Registry” should be acknowledged as a secondary institution in addition to the author’s Hospital or University. This applies whether the primary data analysis is performed by the author or by ANZDATA staff. Where the author is an ANZDATA office holder or staff member then the primary attribution should be “ANZDATA Registry”.

Where ANZDATA data is only a minor portion of the work, then it may be more appropriate to acknowledge the source explicitly in the “Acknowledgements” section.

In both cases the disclaimer on below of this report should be included.

In all cases the source and treatment of the data should be made clear in the “Methods” section. Preferably the abstract (and keywords if applicable) should also include “ANZDATA” which would allow for searching Registry publications.

SUGGESTED CITATION

An example of a suggested citation for this report is as follows:

M Roberts, C Davies, E Au, S Bateman, J Chen, K Hurst, G Irish, D Lee, H McCarthy, S McDonald, W Mulley, T Sun, P Clayton. 46th Report, Chapter 4: Haemodialysis. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2023. Available at: <http://www.anzdata.org.au>

REQUESTS OF ADDITIONAL DATA

Not Included in the Annual Report

ANZDATA is committed to acting in accordance with Australian and New Zealand national privacy principles, and is open and transparent about the collection, management and usage of information. Details regarding the principles and policies guiding data requests to the Registry can be found at <https://www.anzdata.org.au/anzdata/services/data-policies/>.

Publications based upon ANZDATA Registry information reported here or supplied upon request, must include the citation as noted above and the following notice:

The data reported here have been supplied by the Australia and New Zealand Dialysis and Transplant Registry. The interpretation and reporting of these data are the responsibility of the authors and in no way should be seen as an official policy or interpretation of the Australia and New Zealand Dialysis and Transplant Registry.

DEFINITIONS AND METHODS

A number of definitions given below are used throughout this report unless otherwise stated.

1. Wording

Throughout this report ‘treatment’ refers to kidney replacement therapy (KRT), including haemodialysis, peritoneal dialysis (PD) and transplantation. In places the word “graft” (or “allograft”) is used for kidney transplant.

HD = haemodialysis

CAPD = continuous ambulatory peritoneal dialysis

APD = automated peritoneal dialysis

ESKD = end stage kidney disease

2. Data collection

ANZDATA collects information from all renal units in Australia and New Zealand. Data collection occurs at two time points. Key events (new patients, deaths, transplants) are notified as they occur, with units requested to send this at least monthly. An extensive cross-sectional survey is then performed annually (for data to 31st December). Data submission can occur either via a web-based interface or paper submission. Once the data has been entered it is validated for consistency and to reduce missing values. For kidney transplants, HLA typing and panel reactive antibodies are obtained direct from OrganMatch and the New Zealand Blood Service. Monthly summaries are distributed to the contributing units. Results contained in this report are based on a final database locked and prepared after the end of year survey returns are received.

3. Inclusion criteria

Included in the Registry are all patients resident in Australia or New Zealand receiving kidney replacement therapy where the intention to treat is long-term, i.e. medical opinion is that kidney function will not recover. Cases of acute kidney injury are excluded. People who move overseas permanently are censored at date of last treatment (or departure in the case of transplant recipients).

4. Modality attribution

When analysing survival by dialysis modality (HD or PD), transfers between modalities are not analysed if less than 30 days.

5. Underlying kidney disease

This is recorded by the treating hospital according to the updated European Renal Association/European Dialysis and Transplantation Association (ERA-EDTA) categories (since 2022), with primary diseases that were reported prior to 2022 using a modified EDTA coding system mapped to these updated categories (details on back of survey form).

6. Deaths

Death rate is predominantly reported as number of patients died/total number of years of treatment of all patients treated at any time during the year. It is expressed as deaths per 100 patient years (pt yrs) at risk.

7. Comorbid conditions

These are recorded by the treating hospital. No formal definitions are supplied; the treating clinician is asked to record whether the patient has coronary artery disease, chronic lung disease, cerebrovascular disease, peripheral vascular disease or diabetes according to their clinical opinion on a yes / suspected / no basis.

8. Transplant Waiting List

The active transplant waiting list is based on data from OrganMatch (Australia) linked probabilistically with ANZDATA.

9. Derived measures

9.1 Haemoglobin

Haemoglobin is recorded as the last available measurement before the end of the survey period.

9.2 Erythropoietic agents

Erythropoietin agent use is recorded as “yes” if these agents were used at any time during the survey period.

9.3 Iron studies

Iron studies are requested within the last three months of the survey period.

9.4 Estimated glomerular filtration rate

Where glomerular filtration rate is estimated from serum creatinine at entry or post transplantation, the CKD-EPI formula is used:

Females with Cr≤62 micromol/L: $eGFR = (144 + 22 \text{ if black}) \times (Cr \cdot 0.0113 / 0.7)^{-0.329} \times 0.993^{\text{age}}$

Females with Cr>62 micromol/L: $eGFR = (144 + 22 \text{ if black}) \times (Cr \cdot 0.0113 / 0.7)^{-1.209} \times 0.993^{\text{age}}$

Males with Cr≤80 micromol/L: $eGFR = (141 + 22 \text{ if black}) \times (Cr \cdot 0.0113 / 0.9)^{-0.411} \times 0.993^{\text{age}}$

Males with Cr>80 micromol/L: $eGFR = (141 + 22 \text{ if black}) \times (Cr \cdot 0.0113 / 0.9)^{-1.209} \times 0.993^{\text{age}}$

Where Cr is creatinine in micromol/L and age is age in years. The correction for "black" race, based on US data, is not applied to any patients.

9.5 Urea reduction ratio / Kt/V

Results are requested in one of these formats, using the stop flow method on a mid-week dialysis. Single pool Kt/V is collected, along with the method used. For conversion of URR to Kt/V urea the formula used ^[2] is $Kt/V = 0.023 \cdot PRU - 0.284$ (note that PRU = percent reduction in urea and not URR).

9.6 Body mass index

Body mass index (BMI) is calculated as $\text{weight (kg)} / (\text{height (m)})^2$. The categories used for adults are: underweight <20 kg/m², normal 20-24.9 kg/m², overweight 25-29.9 kg/m², obese ≥30 kg/m². For paediatric patients age-adjusted z-scores are used to categorise BMI.

9.7 Peritoneal dialysis measures

These are the standard measures, often calculated by computerised patient management programs.

9.7.1 Residual renal function

The measure used is the arithmetic mean of urea and creatinine clearance from a 24-hour urine collection and serum creatinine and urea.

9.7.2 Peritoneal equilibration test

The ratio of dialysate to plasma glucose is used, following a 4 hour dwell of a 2 litre 2.5% bag of dialysate, performed within 6 months after initiation of peritoneal dialysis.

10. Rates and Measures

10.1 Incidence rates

Except where otherwise stated, quoted incidence rates are per calendar year, and are expressed per million population.

10.2 Prevalence rates

Except where otherwise specified, prevalence rates are point prevalence rates at 31st December 2022.

10.3 Population denominator

All populations used in this report were stratified by age and sex.

Australian populations were taken from the Australian Bureau of Statistics (ABS) and New Zealand populations were taken from Stats NZ.

All estimated and projected populations used for Australia and New Zealand were for 30 June of each year, and all websites were accessed 20 December 2022 for analysis of the annual 2022 locked dataset.

Estimated population data for each Australian state and territory came from ABS 3101.0 series ⁽³⁾

Projected population data for each Australian state and territory came from ABS 3222.0 series ⁽⁴⁾

Population data for Indigenous Australians were taken from ABS 3238.0⁽⁵⁾, using series A for populations after 2011.

Populations serviced by the Greater Southern Area Health Service were estimated by the South Eastern Region of NSW. These estimates were taken from ABS 3235.0⁽⁶⁾.

All New Zealand population estimates were taken from Stats NZ Infoshare⁽⁷⁾ and population projections were taken from NZ.Stat⁽⁸⁾. Maori populations were taken from NZ Infoshare Maori population estimates⁽⁹⁾.

Estimates of resident populations by other ethnicities were taken from Stats NZ⁽¹⁰⁾ for years 2013 onwards.

10.4 Death Population Data

All Australian death data were taken from ABS 3302.0 series⁽¹¹⁾. Death data is not available for publications by age and sex on ABS website for some states. Overall data by states and territory is used. New Zealand death data were taken from NZ Infoshare⁽⁷⁾.

10.5 Survival rates

For transplant recipients, survival rates exclude those who were transplanted overseas or were recipients of multiple organ grafts.

Rates for patient survival for fixed periods for transplantation are calculated according to the life-table method and thus include an adjustment to the risk-set of ½ of those censored without failure over the interval to create an “average” risk set.

10.6 Graft survival

For outcomes of kidney transplants, graft failure includes both loss of graft function (i.e. return to dialysis) and death of patients (with graft function). Calculations of patient survival for transplant recipients includes all subsequent modalities (i.e. deaths after graft failure are included). Patients transplanted overseas are excluded from calculations.

10.7 Dialysis Survival

Patients are followed up until they are either transplanted (at which point they are censored) or until they have a ‘permanent’ change of dialysis modality or until death or most recent follow up date.

10.8 Peritonitis Survival

Peritonitis survivals are calculated from first peritoneal dialysis (ignoring all earlier treatments) to date of first peritonitis episode. If there were no episodes of peritonitis then calculation is censored at change of treatment from peritoneal dialysis to haemodialysis or transplantation. Peritoneal dialysis includes automated peritoneal and continuous ambulatory peritoneal dialysis. Excluded are patients who had peritonitis before commencing peritoneal dialysis.

10.9 Death and other event rates

Rates are expressed per 100 person years at risk (unless otherwise stated). Some analyses include survival of all patients, others exclude the first 90 days of follow up. This is stated in the individual analyses.

10.10 Age standardisation

All rates are crude, not age-standardised. The age distribution of the populations for Australia and New Zealand can be obtained by contacting the Registry.

10.11 Peritonitis rates

Peritonitis rates are present using episodes of peritonitis reported during periods of peritoneal dialysis - episodes reported prior to commencement of peritoneal dialysis (for example between Tenckhoff catheter insertion and commencement of peritoneal dialysis) are not included in these calculations.

11. Database

Data is stored on a relational database using SQL Server 2019.

12. Statistics

Statistical analyses were performed using Stata version 18.

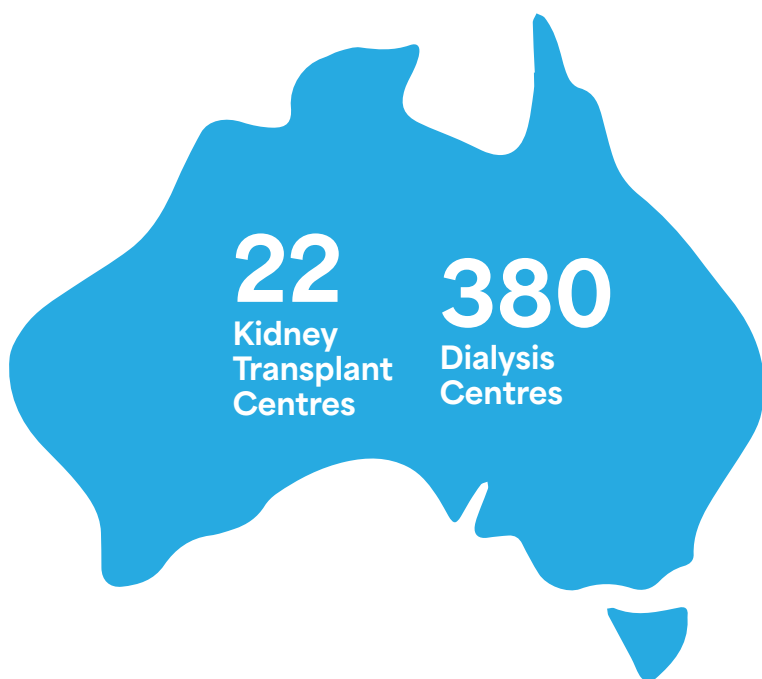
13. References

- Levey AS, Stevens LA, Schmid CH, Zhang YL, Castro AF, Feldman HI, et al. A new equation to estimate glomerular filtration rate. *Ann Intern Med.* 2009 May 5;150(9):604-612.
- Basile C, Casino F, Lopez T: Percent reduction in blood urea concentration during dialysis estimates Kt/V in a simple and accurate way. *Am J Kidney Dis* 1990; 15:40-45.
- <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/jun-2022>
- [http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3222.02017%20\(base\)%20to%202066?OpenDocument](http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3222.02017%20(base)%20to%202066?OpenDocument)
- <https://www.abs.gov.au/statistics/people/population/regional-population-age-and-sex/latest-release>
- <http://archive.stats.govt.nz/infoshare/>
- <http://nzdotstat.stats.govt.nz/wbos/Index.aspx#>

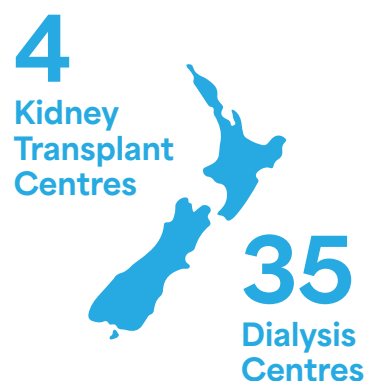
CONTRIBUTING UNITS ACROSS AUSTRALIA & NEW ZEALAND

Parent hospitals, transplanting unit and satellite dialysis units together with their state and unit codes are listed below.

In some cases, these have combined as part of a regional network and this is also indicated. The definition of a 'parent hospital' is a pragmatic one and refers to units which offer a full range of dialysis services (i.e. can commence patients on dialysis, have on-site nephrologist presence and can deal with patients of all degrees of complexity). In contrast, satellite units provide haemodialysis treatments to selected patients, usually with lower staff ratios and no nephrologist on site.



Care provided by **110 adult** and **8 paediatric Renal Units** across two countries, for patients on kidney replacement therapy (KRT)



Country	Code	Name
NZ	AUCK	Auckland City Hospital
	BYPL	Bay Of Plenty Renal Unit
	CHCH	Christchurch Hospital
	DUDN	Dunedin Hospital
	HAWK	Hawkes Bay Hospital
	MIDM	Middlemore Hospital
	PALM	Palmerston North Hospital
	STAR	Starship Children's Hospital
	TARA	Taranaki Hospital
	WKTO	Waikato Hospital
	WMAT	Waitemata Renal Service
	WELN	Wellington Regional Hospital
	WHAN	Whangarei Hospital

State Code	Code	Name
	BUND	Bundaberg Hospital
	CAIR	Cairns Hospital
	RCPR	Cairns Private Hospital
	CHER	Chermside Dialysis Centre
	CARS	Child and Adolescent Renal Service
	COOK	Cooktown Satellite Hospital
	G CPR	Gold Coast Private Hospital
	GOLD	Gold Coast University Hospital
	GREEN	Greenslopes Private Hospital
	HERV	Hervey Bay Hospital
	IPSW	Ipswich Hospital
	FLYN	John Flynn Private Hospital
	MACK	Mackay Base Hospital
	QMAT	Mater Hospital, Brisbane
	MTOW	Mater Hospital, Townsville
	MYFD	Morayfield B.Braun Renal Care Centre
	MTIS	Mount Isa Base Hospital
QLD	NPRV	Nambour Selangor Private Hospital
	NLKP	North Lakes Dialysis Centre
	PIND	Pindara Renal Unit
	PSAH	Princess Alexandra Hospital
	QRTS	Queensland Kidney Transplant Service
	ROCK	Rockhampton Hospital
	RBSH	Royal Brisbane And Women's Hospital
	STIP	St Andrew's Ipswich Private Hospital
	GSTA	St Andrews Toowoomba B.Braun's Dialysis Clinic
	SCUH	Sunshine Coast University Hospital
	SCPR	Sunshine Coast University Private Hospital (Ramsay)
	WSLY	The Wesley Hospital Brisbane
	THUR	Thursday Island Hospital
	TWMB	Toowoomba Hospital
	TCKH	Torres & Cape Kidney Health
	TOWN	Townsville University Hospital
	BATH	Bathurst Base Hospital
	COFF	Coffs Harbour Hospital
	CONC	Concord Repatriation General Hospital
	DUBB	Dubbo Base Hospital
	GOSF	Gosford Hospital
	GREG	Gregory Hills B.Braun Renal Care Centre
	GRIF	Griffith Base Hospital
	HUNT	John Hunter Hospital
NSW	LISM	Lismore Base Hospital
	LVPR	Liverpool Private Dialysis Centre
	MANN	Manning Rural Hospital
	MATR	Mater Hospital, North Sydney
	MAYO	Mayo Private Hospital
	NEPN	Nepean Hospital
	NCAS	Newcastle Dialysis Centre
	ORAN	Orange Health Service
	PTMQ	Port Macquarie Base Hospital
	PMPH	Port Macquarie Private Hospital

State Code	Code	Name
	RNSH	Royal North Shore Hospital
	RPAH	Royal Prince Alfred Hospital
	SSYD	South West Sydney Renal Service
	STGH	St George Hospital
	STVI	St Vincent's Hospital Sydney
	LPDC	St Vincent's Lismore Private Dialysis Centre
	STVP	St Vincent's Private Hospital Sydney
NSW	SADV	Sydney Adventist Hospital
	SCHL	Sydney Children's Hospital
	TAMW	Tamworth Hospital
	CHWM	The Children's Hospital At Westmead
	POWH	The Prince Of Wales Hospital
	TWHD	Tweed Valley Hospital
	WAGG	Wagga Wagga Base Hospital
	WEST	Westmead Hospital
	WGNG	Wollongong Hospital
ACT	ACSN	Access Nephrology
	CANB	Canberra Hospital
	ALFD	Alfred Hospital
	AUST	Austin Hospital
	BEND	Bendigo Hospital
	GDIA	Diamond Valley B.Braun Renal Care Centre
	EHRS	Eastern Health Integrated Renal Services
	EPWE	Epworth Eastern Hospital
	EPGL	Epworth Geelong Hospital
	EPWT	Epworth Richmond Hospital
	FORE	Forest Hill Dialysis Centre
	MALV	Malvern Dialysis Centre
	MMCP	Monash Childrens Centre
VIC	MMCA	Monash Medical Centre
	NMDC	North Melbourne B.Braun Renal Care Centre
	NHSM	Northern Health Service Melbourne
	RCHL	Royal Children's Hospital
	SVIN	St Vincent's Hospital Melbourne
	SNSH	Sunshine Private Dialysis Centre - Fresenius
	RMBH	The Royal Melbourne Hospital
	GLNG	University Hospital Geelong Barwon Health
	WSTH	Western Health Service
TAS	LAUN	Launceston General Hospital
	RHBT	Royal Hobart Hospital
	CNAR	Central Northern Adelaide Renal Service
SA	FMDC	Flinders Medical Centre
	WCHL	Women's And Children's Hospital
	ALIC	Alice Springs Hospital
NT	DARW	Royal Darwin Hospital
	FSTH	Fiona Stanley Hospital
WA	PCHL	Perth Children's Hospital
	RLPT	Royal Perth Hospital
	SCGH	Sir Charles Gairdner Hospital

CHAPTER CONTENTS PAGES

CHAPTER 1

Summary and Highlights	3
Suggested Citation	3
Incident Patients	4
Late Referral	10
Body Mass Index	12
Co-morbidities	13
Primary Kidney Disease	15
Timing of Kidney Replacement Therapy Start	18
References	19

CHAPTER 2

Summary and Highlights	3
Suggested Citation	3
All Kidney Replacement Therapy Modalities	4
Dialysis	10
Co-morbidities	12
References	13

CHAPTER 3

Summary and Highlights	3
Suggested Citation	3
Survival	4
Death Rates	5
Median Survival	7
Cause of Death	8
Withdrawal from Kidney Replacement Therapy	9
References	10

CHAPTER 4

Summary and Highlights	3
Suggested Citation	3
Incidence, Cessation and Prevalence	4
Patient Survival	7
Vascular Access	12
Incident Patients	12
Prevalent Patients	14
Dialysis Prescription	16
Hours, Sessions and Blood Flow	16
Haemodialysis and Haemodiafiltration	21
Place of Dialysis and Self-Care	23
Home Haemodialysis	24
Prevalence	24
Home Haemodialysis Survival and Treatment Failure	26
Home Haemodialysis Prescription	28
Laboratory Based Data at the time of the Annual Survey	30
Anaemia management	30
Calcium and Phosphate	32
Urea Reduction Ratio	33

CHAPTER 5

Summary and Highlights	3
Incidence, prevalence and usage	4
Peritoneal Dialysis Fluids	10
Patient Survival	13
Time on Peritoneal Dialysis	16
Peritonitis	24
Australian Peritonitis Registry	26
Laboratory Based Data at the time of the Annual Survey	30
Anaemia management	30
Biochemistry	26
References	32

CHAPTER 6

Summary and Highlights	3
Suggested Citation	3
Waiting List Dynamics	4
Proportion of Patients Transplanted or on Waiting List	9
Time to Wait-listing	12
Waiting List Demographics	14
Transplant Rate	16
Outcomes of Wait-listing	18
Survival after Wait-listing	21

CHAPTER 7

Summary and Highlights	3
Suggested Citation	3
New Transplants	4
Prevalent Transplants	10
Graft Loss	17
Immunosuppression	20
Delayed Graft Function	25
Rejection	26
Patient and Graft Survival	27
References	42

CHAPTER 8

Summary and Highlights	3
Suggested Citation	3
Deceased Kidney Donors	4
Living Kidney Donors	7
Living Donor Characteristics	12
Timing of Living Kidney Donor Transplantation	13

CHAPTER 9

Summary and Highlights	3	Ethnicity and Kidney Replacement Therapy in Aotearoa New Zealand	10
Suggested Citation	3	New Patients	10
Kidney Replacement Therapy in Aotearoa New Zealand	4	Primary Kidney Disease	13
Incidence of Kidney Replacement Therapy (KRT)	4	Incidence Rates	13
Primary Cause of Kidney Disease	5	Prevalent Patients	15
Children and Young Adults	5	Diabetes	16
Age	6	Incidence and Prevalence per Population	17
Prevalence of Kidney Replacement Therapy	7	Transplantation	18
Dialysis	8	Transplant Survival	20
Transplantation	9	Dialysis	22
Late Referral to Nephrology Services	9	Timing of Dialysis Initiation	23
		Vascular Access	24
		Incident Vascular Access	24
		Prevalent Vascular Access	25
		Patient Flow	26
		Cause of Death	27
		Late Referral to Nephrology Services	28
		References	29

CHAPTER 10

Summary and Highlights	3
Suggested Citation	3
New Patients	4
Primary Kidney Disease	6
Incidence Rates	7
Prevalent Patients	11
Transplantation	13
Transplant Survival	16
Dialysis	18
Timing of Dialysis Initiation	19
Incidence and Prevalence by State/Territory	20
State/Territory Incidence	20
Dialysis by Resident State	21
Transplantation by Referring State/Territory	21
Deaths by Resident State/Territory	22
Geographical Distribution	23
Late Referral	25
Vascular Access	26
Incident Vascular Access	26
Prevalent Vascular Access	27
Patient Flow	28
Cause of Death	29
References	30

CHAPTER 11

Summary and Highlights	3
Suggested Citation	3
New Patients	4
Primary Kidney Disease	5
Incidence Rates	5
Prevalent Patients	7
Incidence and Prevalence per Population	9
Transplantation	10
Patient and Transplant Survival	12
Dialysis	14
Timing of Dialysis Initiation	15
Late Referral	15
Vascular Access	16
Incident Vascular Access	16
Prevalent Vascular Access	17
Patient Flow	18
Cause of Death	19
References	20

CHAPTER 12

Summary and Highlights	3
Suggested Citation	3
Incidence and Prevalence	4
Primary Kidney Disease	5
Modality of Treatment	6
Paediatric Assessment	7
Dialysis Delivery and Adequacy	9
Vascular Access	13
Peritoneal Dialysis	14
Peritonitis	15
References	16

DATA COLLECTION FORMS

AUS. & N.Z. DIALYSIS AND TRANSPLANT SURVEY

THIS SECTION FOR ALL PATIENTS (FORM A3)

REGISTRY NUMBER: [] INITIAL HOSPITAL: [] CURRENT PARENT HOSPITAL: []

SURNAME: [] GIVEN NAMES: [] DATE OF BIRTH: [] GENDER: []

PRIMARY KIDNEY DISEASE: [] BIOPSY: [] WAS A GENETIC TEST PERFORMED?: [] PKD DIAGNOSIS FROM TEST: [] CAUSATIVE GENE: []

SECRETATINE: [] LATE REFERRAL: [] <3 MONTHS BEFORE FIRST TREATMENT (Y/N): [] HEIGHT (cm): [] WEIGHT (kg): []

COUNTRY OF BIRTH (If Australia or NZ - Tick box): [] ETHNICITY 1 (Record from list): [] ETHNICITY 2 (Record from list): [] OTHER (Specify): [] CIGARETTE SMOKING: []

CO-MORBID CONDITIONS (required) (optional)

DISEASE AT ENTRY, LAST AND DURING CURRENT SURVEY

ENTRY	CHRONIC LUNG	CORONARY ARTERY	PERIPHERAL VASCULAR	CEREBRO VASCULAR	DIABETES (see codes)	CALCIPHYLAXIS EPISODE	POSTCODE
LAST	[]	[]	[]	[]	[]	[]	[]
CURRENT	[]	[]	[]	[]	[]	[]	[]

Registry Trials: [] Not Applicable [] Non-Registry Trials: []

OTHER CO-MORBID CONDITIONS (Write in)

AT ENTRY OR PREVIOUS SURVEYS

CURRENT: []

CENTRE OF TREATMENT

HOSPITAL / CENTRE NAME (Write in or tick if same): [] CENTRE CODE: [] DATE TRANSFER: []

Enter geographical location at Death or End of Survey

LAST: []

REASON FOR DIALYSIS MODALITY CHANGE FROM CAPD to APD / APD to CAPD / Any PD to HD / HD to any PD

Enter Reason for Change FROM Previous Modality TO Current Modality - Refer to codes on back of form

HEPATITIS C ANTIBODY

1-Positive 2-Negative 3-Not done

CURRENT: [] LAST: []

COURSE OF TREATMENT COMPLETE ACCORDING TO CODE

CODE	SEQ	CODE	DAY	MTWTF	YR	REASON	SEQ	CODE	DAY	MTWTF	YR	REASON
E	1	APD / APD					16					31
ED	2	APD/HD Hybrid (with Hospital HD)					17					32
ED	3	APD/HD Hybrid (with Satellite HD)					18					33
M	4	CAPD					19					34
MB	5	CAPD Hybrid (with Hospital HD)					20					35
MD	6	CAPD Hybrid (with Satellite HD)					21					36
D	7	Satellite HD					22					37
Y	8	Home HD					23					38
H	9	HD Community House					24					39
G	10	Transplant in AUS/TNZ					25					40
X	11	Date of last post graft dialysis					26					41
P	12	Transplant Overseas					27					42
J	13	Graft function ceased - Temporary					28					43
K	14	Graft function ceased - Permanent					29					44
L	15	Own kidney function recovered					30					45
Q	16	Dialysis ceased										
W	17	Date of last visit / last to follow up										
Z	18	Withdrawn from Dialysis										
	19	Date of Death										

DATE OF DEATH: [] CAUSE OF DEATH (Record from list): [] GRAFT SUSTAINING LIFE? (Y/N): []

Without dialysis at time of death []

CANCER EVER (Y/N): []

Complete a Cancer Form (Form CA) for all non-skin and skin cancers.

ETHNICITY

0000 Reasonable Unidentifiable

1001 Not Stated

1101 Oceanian - Australian

1102 Oceanian - Australian Aboriginal

1103 Oceanian - Australian South Sea Islander

1104 Oceanian - Torres Strait Islander

1201 Oceanian - New Zealand Māori

1202 Oceanian - New Zealand European

1300 Oceanian - Melanesian And Papuan (Specify)

1301 Oceanian - Moresuan (Specify)

1500 Oceanian - Polynesian (Specify)

1501 Cook Islander

1502 Fijian

1503 Niuean

1504 Samoan

1505 Tongan

1506 Tokelauan

1515 Cook Islands Māori

2000 North-West European (Specify)

2001 Southern and Eastern European (Specify)

3103 Southern and Eastern European - Italian

3205 Southern and Eastern European - Greek

4000 North African and Middle Eastern (Specify)

4100 North African and Middle Eastern - Arab (Specify)

4907 North African and Middle Eastern - Turkish

5000 South-East Asian (Specify)

5001 South-East Asian - Vietnamese

5201 South-East Asian - Filipino

5202 South-East Asian - Indonesian

5205 South-East Asian - Malay

6000 North - East Asian (Specify)

6101 North - East Asian - Chinese

7000 Southern and Central Asian (Specify)

7100 Southern Asian (Specify)

7105 Southern and Central Asian - Indian

7200 Central Asian (Specify)

8100 North American (Specify)

8105 Hispanic North American

8300 South American (Specify)

8301 Central American (Specify)

8400 Caribbean Basin (Specify)

9000 Sub-Saharan African (Specify)

9999 Other (Specify)

REASON FOR MODALITY CHANGE

From CAPD to APD

From APD to CAPD

From any form of PD to HD

From HD to any form of PD

10 Recurrent/Permanent Peritonitis

11 Acute Peritonitis

15 Tunnel/Exit Site Infection

16 Overweight

20 Inadequate Solute Clearance

21 Inadequate Fluid Ultrafiltration

22 Excessive Fluid Ultrafiltration

27 Abdominal Access

30 Dialysis Leak

31 Catheter Block

32 Haemoperitoneum

33 Catheter Fall Out

35 Hernia

36 Abdominal Pain

40 Abdominal Surgery

41 Sclerosing Peritonitis

43 Multiple Adhesions

44 Pregnancy

45 Haematuria

46 Pleural Effusion

47 Cardiovascular

48 Geography

49 Vascular Access

50 Patient Preference

51 Unable to Manage Self-Care

51 Transfer Outside Australia or NZ

60 Other Asian (Specify)

62 Other Surgery

83 Hypertension

85 Poor Nutrition

86 Acute Oedema

90 Planned Transfer After Acute PD Start

91 Planned Transfer After Acute HD Start

99 Other (Specify)

TYPE OF DIABETES

0 - No

1 - Type 1 - Insulin dependent

2 - Type 2 - Non-insulin requiring

3 - Type 2 - Insulin requiring

9999 Other (Specify)

CAUSE OF DEATH

CARDIAC

10 Myocardial Ischaemia (Presumed)

11 Myocardial Ischaemia And Infarction

12 Pulmonary Oedema

13 Hypertension

14 Haemorrhagic Pericarditis

15 Hypertensive Cardiac Failure

16 Cardiac Arrest/Cause Uncertain

17 Other Cause Cardiac Failure (Specify)

VASCULAR

21 Pulmonary Embolus

22 Cerebrovascular Accident

23 Gastrointestinal Haemorrhage

24 Haemorrhage From Dialysis Access Site

25 Haemorrhage From Transplant Artery

26 Aortic Aneurysm Rupture

27 Haemorrhage From Elsewhere (Specify)

28 Bowel Ischemia

CAUSATIVE GENE

Please refer to website for a list of codes: <https://services.anzdata.org.au/web/services/CodesIndexCodeCausativeGene>

COMPLETE ALL RELEVANT SECTIONS IN THE EVENT OF THE PATIENT HAVING MORE THAN ONE TREATMENT IN THE SURVEY PERIOD.

THIS SECTION IS FOR ALL PATIENTS DIALYSED AT ANY TIME DURING THIS SURVEY PERIOD

TYPE OF DIALYSIS: [] SELF CARE DIALYSIS: [] DRY WEIGHT AT LAST DX: [] UNCORRECTED CALCIUM: [] PHOSPHATE: [] HAEMOGLOBIN: [] EPO AGENT: [] FERRITIN: [] SATURATION IRON %: []

HAEMODIALYSIS

DIALYSER BRAND (Write in): [] BRAND NAME AND MODEL: [] BFR: [] HDF VOLUME (L): [] SESSIONS / WEEK: [] HOURS / SESSION: [] UREA REDUCTION OR KtV: [] FIRST HD: [] AT LAST HD: []

PERITONEAL DIALYSIS

CONNECTION SYSTEM: [] WEEKLY EXCHANGES TOTAL VOLUME: [] PD SOLUTIONS (Y/Yes N/No): [] PERITONITIS DATE OF FIRST EPISODE: [] NUMBER OF PERITONITIS EPISODES DURING SURVEY: []

First PDC Date of insertion: [] PET TEST (once only) Within first 6 mths: [] CREATININE CLEARANCE Dialysate ONLY: [] WEEKLY KtV Dialysate ONLY: [] RESIDUAL RENAL FUNCTION Residual Urine Volume: []

CURRENT GRAFT (IN THE EVENT OF BOTH GRAFT FAILURE AND RE-TRANSPLANT IN THIS SURVEY - USE A NEW FORM)

GRAFT DATE OF TRANSPLANT: [] HOSPITAL: [] HOSPITAL: [] HOSPITAL: [] RECIPIENT ANTI-BODY (Status at Graft): [] ANASTOMOSIS SITE: []

DONOR DETAILS SOURCE: [] AGE: [] SEX: [] TOTAL SCHEMIA: [] IMMEDIATE FUNCTION: [] DISEASE IN GRAFT: [] DATE FIRST PROVEN (eg. Graft biopsy): [] GRAFT FAILURE CAUSE: [] Serum Creatinine at Graft Failure: []

MONOCLONAL / POLYCLONAL THERAPY (Record from list)

COURSE	DATE	AGENT	OTHER	NO OF DOSES GIVEN	REASON	OTHER	NUMBER OF REJECTION EPISODES
1st	[]	[]	[]	[]	[]	[]	[]

TOTAL DAILY DRUG DOSE (mg)

TOTAL INITIAL DOSE	1 Mth	2 Mth	3 Mth	6 Mth	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	15 Yr	20 Yr	25 Yr	30 Yr	35 Yr	40 Yr	45 Yr	50 Yr	
AZA																			
CVA																			
PHED																			
MPA																			
SURCS																			
TACROL																			
WEIGHT(kg)																			

SERUM CREATININE (umol/L): []

PARENTHOOD (Y/N): [] Complete the Pregnancy Outcome Form (Form PA) if patient has become pregnant or delivered a child during this survey

PAEDIATRIC ASSESSMENT (Y/N): [] Complete Paediatric Assessment Form (Form PA) for any assessment during the survey

INFECTION

Please enter code for nature of infective organism, after the code for site of infection. Please specify type of organism, eg. Staph, CWV, CMV, Carditis, etc.

322 Lung infection - bacterial (specify)

323 Lung infection - viral (specify)

324 Lung 2 Viral

325 Urinary tract

326 Fungal

327 Protozoa

328 Other

329 Abdominal

330 Sepsaemia - site unknown (specify organism)

331 Liver (incl. viral Hepatitis) (specify A, B, CMV, herpes etc)

339 Other site (specify)

PD CLEARANCE STUDIES

Generated from a 24 hour collection of PD effluent and urine.

NOTE: Urea, Creatinine Clearance and KtV both refer to dialysis clearances ONLY (NOT the total of dialysis and renal clearances).

CREATININE CLEARANCE (Dialysate only)

Range: 10-200 litres/week

Litres/week/1.73m² Body Surface Area

DIALYSATE WEEKLY KtV - Range: 0.1 - 5.0

Litres/week/1.73m² Body Surface Area

SOURCE OF DONOR KIDNEY

100 Deceased

200 Sister

201 Brother

202 Mother

203 Father

204 Monozygotic (Identical Twin Girl)

205 Monozygotic (Identical Twin Boy)

206 Dizygotic (Non-Identical Twin Girl)

207 Dizygotic (Non-Identical Twin Boy)

208 Daughter

209 Son

210 Grandmother

211 Grandfather

212 Cousin

213 Niece

214 Nephew

215 Aunt

216 Uncle

217 Other related (Genetically - Specify)

300 Wife

301 Husband

302 Partner

303 Financee

304 Mother-in-law

305 Father-in-law

306 Stepmother

307 Stepfather

308 Stepbrother

309 Stepsister

310 Sister-in-law

311 Brother-in-law

312 Daughters-in-law

313 Son-in-law

314 Stepdaughter

315 Stepson

316 Friend

317 Other related (Emotionally - Specify)

401 Non-directed, waiting list

402 Non-directed, kidney exchange

403 Directed kidney exchange

404 Psychological

405 Other unrelated (Specify)

500 SOS NOS Living Donor

REJECTION

10 Hyperacute Rejection (within 48 Hrs of Transplantation)

20 Acute Rejection at anytime Causing Graft Failure

41 Chronic Antibody Mediated Rejection (Biopsy Proven)

42 Interstitial Fibrosis/Tubular Atrophy (Biopsy Proven)

43 Gradual Graft Failure (Biopsy Not Proven)

CAUSE OF GRAFT FAILURE

50 Renal Artery Stenosis

51 Renal Artery Thrombosis

52 Renal Vein Thrombosis

53 Haemorrhage (Primary)

54 Haemorrhage (Secondary)

55 Embolus - Thrombotic

56 Embolus - Cholesterol

57 Haemolytic Uraemic Syndrome

TECHNICAL

60 Non-Viable Graft (Due To Pre-Transplant Cortical Necrosis)

61 Cortical Necrosis, Post Transplant (Not Due To Rejection)

62 Urinary and Bile Duct Problems

GLOMERULONEPHRITIS

82 Mesangiocapillary GN with Subendothelial Deposits

83 Mesangiocapillary GN with Intra-membranous Deposits (Dense Deposit Disease)

84 Focal Segmental GN (Including Hyaline)

85 Membranous GN

86 Mesangial Proliferative (Iga Positive)

87 Goodpasture Syndrome

88 Intra and Extra Capillary GN (Clinically Rapidly Progressive)

89 Glomerulonephritis Other (Specify)

DRUG THERAPY

90 Complications of Drug Therapy Requiring Reduction or Withdrawal of Steroid and/or Immunosuppressants

91 Non-Compliance with Therapy - Causing Graft Failure

92 Rejection Following IS Reduction Due to Malignancy

93 Rejection Following IS Reduction Due to Infection

MISCELLANEOUS

00 Miscellaneous Other (Specify)

01 Donor Malignancy

02 Malignancy Involving Graft

09 BK Virus Nephropathy

MONOCLONAL/POLYCLONAL THERAPY

Record in order of administration, each separate course of such drug; a second course of the same drug should be separately recorded.

Complete the requested details regarding date, identity of drug, number of doses given, and reason for administration, according to the following codes.

TYPE OF AGENT

10 Rituximab

2 Daclizumab (Zenpeas)

4 OKT3

5 Interleukin Immunoglobulin

6 Basiliximab

7 Riximab

8 Polyclonal T Cell

9 Other Monoclonal (Specify)

TOTAL DAILY DRUG DOSE

Enter the total daily dose for each drug where applicable; if an unlisted drug is used, enter the name in the space provided marked OTHER.

Only those drugs taken at the listed intervals should be entered; where necessary provide the dose recorded on the closest day preceding the requested time interval.

The initial drug dose (at zero months) is the first **and maintenance dose**; do NOT enter the intravenous loading doses administered at or shortly after transplantation.



ANZDATA Registry Peritonitis Episode Form

Form PE

This form is additional to the main data form (Form A3) and is completed during the survey period

REGISTRY NO	CURRENT HOSP	SURNAME	GIVEN NAMES	DATE OF BIRTH

For each episode enter a separate "Peritonitis Episode Form"

In the survey period, indicate the number of peritonitis episodes on the main Survey Form (Form A3)

DATE OF INFECTION

--	--	--	--

WAS THIS EPISODE A RELAPSE OR RECURRENCE?

N = No
 L = Relapse
 C = Recurrence

RELAPSE = Peritonitis within 4 weeks of completion of antibiotics with the same organism and/or a culture negative episode
RECURRENCE = Peritonitis within 4 weeks of completion of antibiotics with a different organism

ORGANISM

No.	Organism	Other (Specify)
1		
2		
3		
4		
5		

ANTIBIOTICS (Do not enter doses)

Antifungal Therapy Y = Yes
N = No

Please select all drugs from the codes list on the back of this form

DRUG TREATMENTS	FIRST	OTHER	SECOND	OTHER	THIRD	OTHER
a) Initial Regimen						
b) Final Antibiotic Regimen						

Date of Last Dose

PD SOLUTIONS AT TIME OF INFECTION Y = Yes N = No

GLUCOSE	ICODEXTRIN	LOW GDP	OTHER (SPECIFY)

OUTCOME

Overnight Hospitalisation <input type="checkbox"/> Y = Yes <input type="checkbox"/> N = No	Number of Nights <input type="text"/>	Comments -
Catheter Removed <input type="checkbox"/> Y = Yes <input type="checkbox"/> N = No	Date <input type="text"/>	
Interim HD <input type="checkbox"/> Y = Yes <input type="checkbox"/> N = No	First Dialysis Date <input type="text"/>	
	Last Dialysis Date <input type="text"/>	
Permanent HD <input type="checkbox"/> Y = Yes <input type="checkbox"/> N = No	<input type="text"/>	

ORGANISM

- Code I Organism
- 1=Culture Negative
- 2=Coag - Neg Staph, Staph Epidermidis
- 3=Coag - Neg Staph, Other (Specify)
- 4=Coag - Neg Staph, Unknown
- 5=Staphylococcus Aureus, Methicillin Resistant
- 6=Staphylococcus Aureus, Non-Mrsa
- 7=Staphylococcus Aureus, Unknown Sensitive
- 8=Streptococcus Viridians Group (Sangius, Bovis, Etc)
- 9=Streptococcus, Other (Specify)
- 10=Streptococcus, Unknown
- 11=Enterococcus (Strep. Faecalis/Faecium)
- 12=Diphtheroids (Corynebacteria)
- 13=Gram Positive Organism, Other (Specify)
- 14=Gram Positive Organism, Unknown
- 15=Pseudomonas Aeruginosa
- 16=Pseudomonas Maltophilia
- 17=Pseudomonas Cepacia
- 18=Pseudomonas Stutzer
- 20=Pseudomonas, Other (Specify)
- 21=Pseudomonas, Unknown
- 22=Acinetobacter Sp
- 23=E. Coli
- 24=Klebsiella Sp
- 25=Enterobacter Species
- 26=Seratia Species
- 27=Proteus Species
- 28=Citrobacter Species
- 29=Other Enterobacteria (Coliforms)
- 30=Neisseria Sp
- 31=Gram Negative Organisms, Other (Specify)
- 32=Gram Negative Organisms, Unknown
- 33=Anaerobic Bacteria
- 34=Candida Albicans
- 35=Candida, Other (Specify)
- 36=Fungi/Yeast, Other (Specify)
- 37=Mycobacterium, Tuberculosis
- 38=Mycobacterium, Other (Specify)
- 39=No Culture Taken
- 40=Other Organism (Specify)
- 41=Roseomonas Gilardii
- 99=Not Reported

ANTIBIOTICS

- Code I Antibiotic
- 1=Amikacin
- 2=Amoxycillin
- 3=Amoxicillin Clavulanic Acid
- 4=Amphotericin B
- 5=Ampicillin/Sulbactam
- 6=Azlocillin
- 7=Aztreonam
- 8=Cefasulodin
- 9=Cefamandole
- 10=Cefazolin
- 11=Cefixime
- 12=Cefmenoxime
- 13=Cefoperazid
- 14=Cefoperazone
- 15=Cefotaxime
- 16=Cefoxitin
- 17=Cefsulodin
- 18=Ceftazidime
- 19=Ceftazoxime
- 20=Ceftroxime
- 21=Cefuroxime
- 22=Cephalexin
- 23=Cephalothin
- 24=Cephradine
- 25=Ciprofloxacin
- 26=Clindamycin
- 27=Cloxacillin
- 28=Clotaxacin
- 29=Erythromycin
- 30=Fleroxacin

ANTIBIOTICS (cont.)

- Code I Antibiotic
- 31=Fluocloxacillin
- 32=Fluconazole
- 33=Flucytosine
- 34=Gentamicin
- 35=Imipenem/Cilastin
- 36=Isoniazid
- 37=Ketorolazole
- 38=Metronidazole
- 39=Metzocillin
- 40=Miconazole
- 41=Minocycline
- 42=Moxalactam
- 43=Mupirocin
- 44=Naseptin
- 45=Netilmicin
- 46=Ofloxacon
- 47=Other Antibiotics (Specify)
- 48=Oxacillin
- 49=Piperacillin
- 50=Pyrazinamide
- 51=Rifampin
- 52=Sulfamethoxazole/Trimethoprim
- 53=Teicoplanin
- 54=Ticarcillin
- 55=Tobramycin
- 56=Unknown Antibiotic
- 57=Vancomycin
- 58=Cefpime
- 60=Tazocin
- 61=Meropenem
- 62=Piperacillin/Tazobactam
- 63=Azithromycin
- 64=Ampicillin
- 65=Cefepime

** If other Antibiotics or organisms are identified, contact the Registry to add to the list.

Version 2020.3.0.10



ANZDATA Registry Cancer Survey Form

Form CA

This form is additional to the main data form

REGISTRY NUMBER	SURNAME	GIVEN NAMES	CURRENT HOSPITAL / STATE

GRAFT	TYPE OF CANCER	SITE OF CANCER	OFFICE USE	GRAFT	TYPE OF CANCER	SITE OF CANCER	OFFICE USE

PRIMARY NON-SKIN TUMOURS AND MELANOMAS - Code from List A

TYPE OF CANCER	DATE OF DIAGNOSIS	LEAVE BLANK	CANCER SITE (From #)	CANCER STAGE AT DIAGNOSIS	TREATMENT TYPES	DATE OF METASTASES	THIS CANCER CAUSED OR CONTRIBUTED TO DEATH	THIS CANCER CAUSED OR CONTRIBUTED TO DEATH
CODE LIST A			CODE LIST B	CODE LIST C	FIRST TO LOCAL LYMPH NODES	FIRST SYSTEMIC (TO ANY OTHER SITE)	LOCAL RECURRENCE	RENAI-FALLURE
							YES/NO	YES/NO

PRIMARY SKIN TUMOURS - ENTER ONLY IF HISTOLOGICALLY PROVEN

Date of Final Diagnosis of each Type of Skin Cancer when on a Treatment Modality eg (pre-Dialysis, On Dialysis, Post Graft Tx)

TYPE OF SKIN CANCER	DATE OF FIRST DIAGNOSIS OF EACH CANCER TYPE IN EACH PERIOD	DATE OF METASTASES (Equivalent to # on #)	THIS TYPE OF CANCER
Do not enter Basal's Disease, Melanocytic/Melanoma, Skin Sarcoma or Squamocarcinoma	PRE ENTRY TO ESPF PROGRAM	ON DIALYSIS	POST TRANSPLANT
		FIRST TO LOCAL LYMPH NODES	FIRST SYSTEMIC (TO ANY OTHER SITE)
BASAL CELL (BCC)			CAUSED OR CONTRIBUTED TO DEATH YES/NO
SQUAMOUS CELL (SCC)			
OTHER (Specify)			

A: TYPE OF NON SKIN CANCER

- 1 Unknown
- 2 Squamous Cell (SCC)
- 3 Adenocarcinoma
- 4 Transitional Cell (TCC)
- 5 Lymphoma (Non Hodgkins) (Please forward histological report)
- 6 Leukaemia (Specify Type)
- 7 Other (Specify)
- 8 Kaposi Sarcoma
- 9 Microglioma of Brain (Please forward histological report)
- 10 Multiple Myeloma
- 11 Hodgkin's Disease (Please forward histological report)
- 12 Lymphoproliferative Disease (Please forward histological report)
- 13 Melanoma

B: HISTOLOGICAL STAGING

- 1 Unknown
- 2 In Situ
- 3 Invasive
- 4 Regional Lymph Nodes
- 5 Distant Metastases
- 6 Cervical Cancer - Cln 1
- 7 Cervical Cancer - Cln 2
- 8 Cervical Cancer - Cln 3 (Equivalent to SCC In Situ)
- 9 Cervical Cancer - Micro-Invasive
- 10 Cervical Cancer - Invasive

C: TYPE OF TREATMENT

- 1 None
- 2 Unknown
- 3 Local Excision
- 4 Wide Excision and Graft
- 5 Wide Excision and Node Dissection
- 9 Radiotherapy
- 10 Chemotherapy
- 11 Immune Stimulant
- 12 Reduction of VS Drugs
- 13 Other (Specify)

Comments -

Version 2022.1.1.0



ANZDATA Registry Paediatric Survey Form

Form
PA

This form is additional to the main Registry Survey Form. Please complete this form for any patient under the age of 15 years. Data collection is complete when patient turns 18 years of age.

INITIAL HOSPITAL		CURRENT PARENT HOSPITAL			Physician
Registry No.	Hospital	Hospital Unit No.	Hospital	Hospital Unit No.	
SURNAME		GIVEN NAMES		DATE OF BIRTH	GENDER

Please complete below AT ENTRY and at the END OF EACH SURVEY

Date	Height (cm)	Weight (kg)	Paediatric Assessment (refer to codes)	Attendance Limited By Dialysis ? (Y/N)	Attendance Limited By Renal Health (Y/N)	Supervised Education Support (Y/N)	Additional Education Support (Y/N)

PAEDIATRIC ASSESSMENT CODES

- 101 Enrolled in mainstream School and in mainstream Class
- 102 Enrolled in mainstream School but special needs Class or has Teacher's Aid
- 103 Enrolled in special needs School
- 104 Home Schooled
- 105 Preschool Child
- 106 Left School - Full or Part Time Work
- 107 Enrolled in Tertiary Education
- 108 Left School - Unemployed

Version 2020.3.0.10

HISTORIC PAEDIATRIC ASSESSMENT CODES (Not active; Codes used prior to Survey 70 - 2019)

- 91 Attends School Full Time In Class Appropriate For Age
- 92 Attends School In Class Appropriate For Age But Attendance Limited By Dialysis Schedule
- 93 Attends School In A Class Lower Than Appropriate For Age
- 94 Attends School For Physically Handicapped Children
- 95 Attends School For Developmentally Handicapped Children
- 96 Medically Unfit
- 97 Preschool Child
- 98 Left School - Full Or Part Time Work (Inc Further Study)
- 99 Left School - Unemployed

Version 2020.3.0.10



ANZDATA Registry Parenthood Outcome Form

Form
PH

This form is additional to the main Registry Survey Form (A3)

REGISTRY NO	CURRENT HOSPITAL	SURNAME	GIVEN NAMES

Please complete this form for any patient with a Parenthood Outcome during the survey period.
Both sides of Form (PH) for Female patients and first page only for Male patients.

DATE OF OUTCOME

--	--	--

PREGNANCY OUTCOME

A = Spontaneous Abortion (<20 weeks)
 L = Live Delivery
 S = Stillbirth (>20 weeks)
 T = Surgical Termination
 I = In Progress

GESTATIONAL AGE (Best clinical estimate)

in weeks

or ESTIMATED DATE OF CONCEPTION (if accurately known)

--	--	--

CONCEPTION

N=Natural
 I=In Vitro Fertilisation (IVF)
 A=Assisted Reproduction (not IVF)
 O=Other
 U=Unknown

FOETAL OUTCOME

Foetal Birth Weight in grams (if applicable)

Congenital Abnormality Yes | No | U=Unknown (Specify below if known)

Foetal Gender M=Male | F=Female | U=Unknown

Neonatal Survival >28 Days Yes | No | E=Not Applicable

COMMENTS

RENAL FUNCTION

Closest available Creatinine ($\mu\text{mol/L}$)

Prior to Conception (all males and females)

At Delivery (only females with transplant)

3 Months Post Delivery (only females with transplant)

IMMUNOSUPPRESSION AT CONCEPTION

Y=Yes | N=No | U=Unknown

CYA	AZA	Pred	Tac	MMF	Sicl	Other
-----	-----	------	-----	-----	------	-------

Page 1 of 2

Parenthood Outcome Form

Please complete the second page for Female Patients Only

LABOUR S=Spontaneous onset labour
 I=Induction of labour
 E=Not Applicable
 N=No Labour

DELIVERY V=Vaginal Delivery
 E=Elective Caesarean
 M=Emergency Caesarean (Specify indication for Caesarean in comments below)
 N=No Delivery

DIABETES D=Pre-conception Diabetes
 G=Gestational Diabetes
 N=No Diabetes
 U=Unknown

PROTEINURIA Last available result prior to conception
 A=ACR mg/mmol
 P=PCR mg/mmol
 U=Unknown

HYPERTENSION See SOMANZ 2014 Definition
 N=No hypertension at any time
 C=Chronic Hypertension pre-conception
 G=Gestational Hypertension (new onset in pregnancy)
 U=Unknown

Pre-Eclampsia Y=Yes | N=No | U=Unknown

Gestational Age Y=Yes | N=No | U=Unknown

Eclampsia Y=Yes | N=No | U=Unknown

HELLP Syndrome Y=Yes | N=No | U=Unknown

MEDICAL COMPLICATIONS IN PREGNANCY
Can Record Multiple Items

UTI = Urinary tract infection
 B = Blood transfusion
 I = Other infection
 A = Antepartum haemorrhage
 P = Postpartum haemorrhage
 V = Venous thromboembolism
 O = Other (specify below)
 U = Unknown

GRAFT FUNCTION DURING PREGNANCY

Closest available creatinine at the end of Trimester ($\mu\text{mol/L}$)

<input type="text"/>	<input type="text"/>	<input type="text"/>
1st	2nd	3rd

Acute Rejection during pregnancy
Y = Yes (complete acute rejection form)

DRUG THERAPY DURING PREGNANCY

Y=Yes | N=No | U=Unknown

Asprin	EPO	Heparin	Iron	Insulin	Metformin	Anti-HTN
--------	-----	---------	------	---------	-----------	----------

DIALYSIS DURING PREGNANCY

C=CAPD
 A=A-PD
 H=Haemo
 N=Nocturnal HD
 U=Unknown
 X=None

Date of Modality

Vascular Access 1=Native
 2=Synthetic
 3=Tunnel CV Catheter
 4=Non-tunnel CV Catheter

HAEMODIALYSIS DURING PREGNANCY

Maximum Hours per week in each Trimester

<input type="text"/>	<input type="text"/>	<input type="text"/>
1st	2nd	3rd

Maximum Sessions per week in each Trimester

<input type="text"/>	<input type="text"/>	<input type="text"/>
1st	2nd	3rd

PERITONEAL DIALYSIS DURING PREGNANCY

Maximum total volume of weekly exchanges in each Trimester (in litres)

<input type="text"/>	<input type="text"/>	<input type="text"/>
1st	2nd	3rd

Page 2 of 2
Version 2020.3.0.10



ANZDATA Registry Rejection Form

Form RE

This Form is additional to the main data form

REGISTRY NO	CURRENT HOSPITAL	SURNAME	GIVEN NAMES
-------------	------------------	---------	-------------

In this survey period, indicate the number of rejection episodes

DATE OF THIS REJECTION	WAS A BIOPSY PERFORMED	IF NO BIOPSY
<input type="text"/>	<input type="checkbox"/> C = Yes (Clinical Suspicion) <input type="checkbox"/> P = Yes (Protocol) <input type="checkbox"/> D = Yes (Delayed Graft Function) <input type="checkbox"/> N = No (Go to Question 2b)	<input type="checkbox"/> On clinical grounds (including response to treatment) was this rejection considered <input type="checkbox"/> 1 = Possible <input type="checkbox"/> 2 = Probable <input type="checkbox"/> 3 = Definite

IF BIOPSY PERFORMED

What type of rejection did the biopsy show? **Please complete all boxes**

Antibody Mediated Y = Yes
 T-cell Mediated N = No

BANFF CLASSIFICATIONS (Enter either Grade 0,1,2,3 for each box)

g	i	t	v	plc	c4d	cg	ci	ct	cv
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
mm	ah	ti	i-IFTA						
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>						

Presence of Donor Specific Antibody (DSA)
 1 = Pre-transplant
 2 = De Novo
 3 = Pre-transplant & De Novo
 4 = No DSA detected

PRIMARY TREATMENT OF THIS REJECTION

Sequential codes may be used eg:

<input type="checkbox"/>	A = Nil
<input type="checkbox"/>	B = Introduction Or Increased Dose Of Steroids
<input type="checkbox"/>	C = Introduction Or Increased Dose Of Steroids And Polyclonal / Monoclonal Therapy *
<input type="checkbox"/>	D = Polyclonal / Monoclonal Therapy Alone
<input type="checkbox"/>	E = Introduction Or Increased Dose Of Cyclosporin A
<input type="checkbox"/>	F = Introduction Or Increased Dose Of Tacrolimus
<input type="checkbox"/>	G = Introduction Or Increased Dose Of Mycophenolate Mofetil
<input type="checkbox"/>	H = Introduction Or Increased Dose Of Sirolimus
<input type="checkbox"/>	I = Plasmapheresis
<input type="checkbox"/>	J = Intravenous Immunoglobulin *
<input type="checkbox"/>	Z = Other (Specify)

Monoclonal/Polyclonal Therapy

* For all Monoclonal / Polyclonal therapies, enter agent & number of doses given.

Agent Code	Doses Given	Type of Agent
<input type="text"/>	<input type="text"/>	5 = Intravenous Immunoglobulin
<input type="text"/>	<input type="text"/>	6 = Basiliximab
<input type="text"/>	<input type="text"/>	7 = Rituximab
<input type="text"/>	<input type="text"/>	8 = Polyclonal Anti T Cell
<input type="text"/>	<input type="text"/>	9 = Other Monoclonal (Specify)

RESPONSE OF THIS REJECTION TO TREATMENT

A = Resolution of rejection with return of graft function to pre-rejection levels or better
 B = Resolution of rejection with improvement of graft function but not to pre-rejection levels
 C = Resolution of rejection but with no improvement of graft function with serum creatinine less than 250 umol/L
 D = Resolution of rejection but with no improvement of graft function with serum creatinine greater than 250 umol/L
 E = Inadequate control of rejection with failure of graft within one month
 F = Rejection not resolved but no graft failure within one month

COMMENTS

Version 2021.2.9.0



ANZDATA Registry Surgical Details Form (Transplant Anastomosis)

Form SU

This form is additional to the main data form

Please complete this form as close to the time of the kidney transplant or post operatively.
Send data to the ANZDATA Registry by fax +61 8 8128 4769 or scan and email to anzdata@anzdata.org.au

ANZDATA Patient ID	Graft No.	DATE OF TRANSPLANT	SURGEON
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Patient Surname Kidney: Left Right

Patient Given Name Affix Patient label here

Facility MRN Donor: DBD DCD LKD

Transplant Facility LKD Donor Relationship to Recipient:

Surgical Details (Please tick a box per line)

Anastomosis Site Left (L) Right (R)

Arterial CIA EIA IIA Aorta Other (specify)

Venous EIV Other (specify)

Cava Extension Yes No

Aortic Patch Yes No

Anastomosis Time (min)

Anastomosis time is the time from removal from ice to reperfusion of the kidney. This should include any time after removal from cold storage whether or not insulation is used (e.g. placement in an ice blanket or a sock for insulation during the creation of the arterial and venous anastomoses). The time is recorded in minutes.

Assessment codes

Arterial Codes	Donor Relationship to Recipient	Venous Codes
1=Common Iliac Artery (CIA)	100=Deceased	204=Monozygotic (Identical Twin Girl)
2=External Iliac Artery (EIA)	200=Sister	205=Monozygotic (Identical Twin Boy)
3=Internal Iliac Artery (IIA)	201=Brother	206=Dizygotic (Non-Identical Twin Girl)
4=Aorta	202=Mother	207=Dizygotic (Non-Identical Twin Boy)
99=Other (Specify)	203=Father	208=Stepfather
	204=Monozygotic (Identical Twin Girl)	209=Stepmother
	205=Monozygotic (Identical Twin Boy)	210=Grandmother
	206=Dizygotic (Non-Identical Twin Girl)	211=Grandfather
	207=Dizygotic (Non-Identical Twin Boy)	212=Cousin
	208=Stepfather	213=Niece
	209=Stepmother	214=Nephew
	210=Grandmother	215=Aunt
	211=Grandfather	216=Uncle
	212=Cousin	217=Other related (Genetically - Specify)
	213=Niece	
	214=Nephew	
	215=Aunt	
	216=Uncle	
	217=Other related (Emotionally - Specify)	

Version: 2023.3.8.1



INTRODUCTION

ANZDATA Registry 46th Report
Annual Report 2023