

Royal Prince Alfred Hospital celebrates

50

years

of kidney transplantation
and dialysis

1967-2017



Health
Sydney
Local Health District



1967

2017

50
years
1967-2017

TRANSPLANT

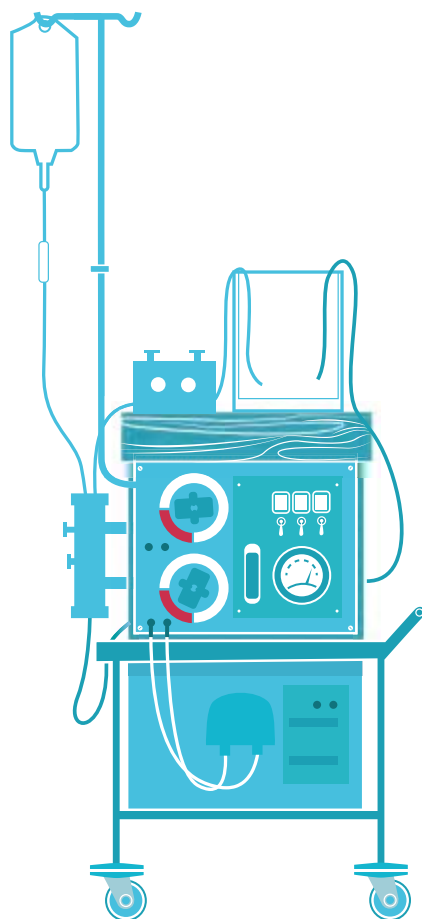
FIRST TRANSPLANT 12 September 1967



- 60%** one year transplant success rate
- 2 bed** transplant ward
- 1 nurse** per shift
- 2 year** wait for deceased donor kidney

DIALYSIS

FIRST HAEMODIALYSIS 27 June 1967



Machine cost:
\$3000
(\$36,655 AUD 2016)



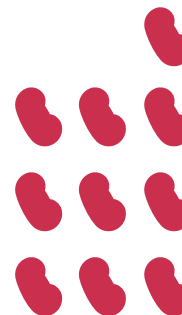
5-6 hour
sessions



72 dialysis
sessions in
the year

TRANSPLANT

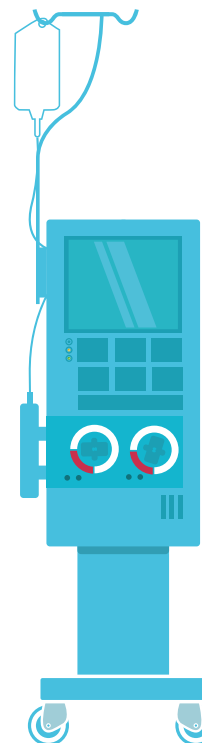
100 + KIDNEY TRANSPLANTS PER YEAR



- 98%** one year transplant success rate
- 24 bed** transplant ward
- 50** members of transplant outpatient team
- 30%** of kidney transplants from living donors

DIALYSIS

28,000 DIALYSIS SESSIONS ANUALLY



33 machines
in RPA satellite centre



10 machines
in RPA hospital



2 shifts
x 6 days a week



5 hours
each session



200 patients
in Home training unit
(haemodialysis and peritoneal dialysis)

Director's Message



50
years
1967-2017

The origins of the RPA Renal Unit date from the late 1950s when Professor Ralph Reader and later John Sands formed a consultative group for 'electrolyte disorders and renal disease'. At the time, Renal Medicine was yet to be recognised as a sub-speciality of Medicine. Short-term peritoneal dialysis was provided to selected patients at RPA during the 1960s, but it was not until 1967 when the real breakthroughs of haemodialysis and transplantation were realised.

Sam Stirling, a patient of Professor Blackburn with end-stage kidney disease, cause unknown, purchased a "kidney machine" for his use and subsequently made it available to others. In the same year, the first kidney transplant was performed at RPA by Professor Ross Sheil and team. These events helped to establish the Renal Unit as a distinct entity and shaped the road forward, providing a survival option for patients who would otherwise have died from end-stage renal disease.

In the early years, there were only a small number of kidney transplants and dialysis patients and, as it was internationally, outcomes were uncertain with many dying within the first year of treatment. Fifty years later, there are now more than two million people worldwide reliant on long-term dialysis for survival and 70,000 receive a kidney transplant annually.

RPA provides care for more than 500 dialysis patients and have performed over 2700 kidney transplants, including

a record 117 transplants in 2016. Our patient outcomes are excellent, with a one year post-transplant survival rate of 98 per cent – as good as or better than anywhere in the world.

When it was established, the RPA Renal Unit set out to help patients with kidney diseases, a focus which remains unchanged to this day.

Our priorities and principals include:

- *Patient and family focussed care*
- *Provision of evidence-based care, where evidence exists, and where it does not to use experience and group expertise*
- *Excellence through research*
- *Ethical practice, including adherence to the Declaration of Istanbul*
- *Promotion of leadership and advocacy, including provision of services to peak health bodies, NGOs and Government*
- *Use of data to inform practice, including ANZDATA and local databases*
- *Gender equality.*

The future is bright for our patients and our service. We are thankful to the hospital administration for their support, to our colleagues who collaborate with us to provide care, and our patients who challenge and reward us every day. We are grateful for the opportunity to reflect on the first 50 years of the Renal Unit, but are also excited to get on with the next 50!

Professor Steve Chadban

Director of Statewide Renal Services
Royal Prince Alfred Hospital

A life of miracles

50
years
1967-2017



When she was three years old, Lucia Droguett's kidneys shut down after contracting an infection from E coli.

Miraculously, her kidneys kicked back in but only returned to 50 per cent function.

Lucia lived 21 years in renal failure, knowing she would need a kidney transplant one day. As a teenager, having the energy to go to social events and keep up with friends was difficult.

"I looked fine on the outside, no one would ever know what was wrong with me."

"Everything that I am, everything that I have would not have been possible if it weren't for RPA."

Lucia met her husband Nathan, when she was 17 and became engaged at 21.

"I'd always wanted to be a mother and after a few years Nathan and I started talking about the possibility of having children. This was the first time I realised how serious my condition was."

When Lucia's kidney function dropped to 20 per cent, her family decided that out of both her parents who were a match, her father, Carmelo, would donate his kidney.

"Dad was so committed to giving me my second chance at life that he totally changed his. He started exercising and eating better and lost 15kg in less than six months."

"The transplant changed my life in so many ways. I'm so lucky because I was able to fulfil my dream of getting married and travelling overseas."



Her second miracle was the birth of a baby girl, Monique this year.

"It's the best feeling in the world to hold our beautiful baby girl in our arms and we couldn't be happier thanks to Kate Wyburn and Sue Jacobs whose expertise and dedication protected me, my kidney transplant and my pregnancy. They are the reason I have my child in my arms today.

"Even though I had to deal with some new hurdles, I was and will forever be grateful that I was given a second chance at life.

"Everything that I am, everything that I have would not have been possible if it weren't for RPA."

40 years and still going strong

50
years
1967-2017



If you asked Derek Hansen

in 1977 if he thought he'd be alive today, he might've told you no. He was 33 and after years on dialysis, expected to have a short life. All of that changed because of the selfless act of his brother and the transplant team at Royal Prince Alfred Hospital.

"My brother Nigel insisted that I take his kidney because I was running out of options. He came all the way from England for the procedure and I haven't needed another transplant since then," he said.

It has been 40 years since the extraordinary team of transplant professionals changed his life in a miraculous way.

"RPA offers the best care in the world without a shadow of a doubt..."



"RPA offers the best care in the world without a shadow of a doubt. No matter what happened, whether it was kidney

related or not, Professors' David Tiller, John Horvath, Josette Eris and Dr Adrian Gillin would always swing into action and ensure I was well looked after," he said.

Hansen lives at home with his wife and daughter. Even after undergoing dialysis and the transplant procedure, he always kept a steady job in consultancy and advertising.



"I was working right up until the day of my transplant and didn't really have much of a choice because it was my own business," he said.

Hansen said that his medical troubles had only made him stronger and led him to live a vibrant and healthy life.

"Shortly after having the transplant, I came down with a cytomegalovirus infection which subsided and thankfully have been healthy ever since," he said.

The kidney transplant couldn't keep Hansen away from what he loved most.

"I got straight back into running and have embraced the opportunities given to me including travelling around Central America and doing some extreme things like the Costa Rican Canopy Tour.

"I tried to keep fit and ran a few marathons, I also represented Australia at the Athens World Transplant Games in 1982 where I picked up a bronze medal," he said.



Gift from the heart

50
years
1967-2017

The anguished cries from visitors farewelling loved ones on life support in an intensive care unit are sounds that Royal Prince Alfred Hospital nurse Mimi Antonios will never forget.

But she also knows that from death can come life – and a second chance for those in need through organ donation.

Mimi's husband, Anthony, has suffered chronic kidney disease most of his life and when her chance to step up came, she didn't hesitate, donating her kidney through the Australian Paired Kidney Exchange Program.

“I was prepared from the start to donate my kidney to him when he needed it...”

“Anthony and I have been married for 18 years and when we met he had already received his first kidney transplant. I knew that one day he'd need another so I was prepared from the start to donate my kidney to him when he needed it,” she said.

Anthony received a new kidney from an altruistic stranger through the program, and a chance to go on living his life after years relying on haemodialysis.

“We both work full time and my dialysis took a hell of a lot out of Mimi's life as well as my own. We really didn't get much sleep over the past three years,” Anthony said.

“Mimi gave away a kidney to a stranger to help me receive one. I can't thank her and the medical, surgical and nursing staff at RPA enough for what they have done for me.”

**JOSETTE ERIS**

MBBS, PhD, FRACP

4/7/1959 – 4/5/2016

Josette spent much of her life at Royal Prince Alfred Hospital and truly became part of its fabric. There was no aspect of its structure, operations, politics or indeed its potential that she did not know and use to the advantage of her team and her patients, for above all Josette was a clinician who cared for patients.

As mentor, supervisor and role model, Josette inspired, trained and retained numerous women in our field. The TSANZ Josette Eris Award for mid-career women in transplantation has been created in recognition.

Josette excelled in service and leadership, with roles including President of the Transplantation Society of Australia and New Zealand, Co-chair of the TTS-TSANZ World Transplant Congress of 2008 in Sydney, Chair of the Dialysis Nephrology and Transplantation committee of ANZSN, Area Director of Renal Medicine at Royal Prince Alfred, and Councillor of The Transplantation Society, Chairing the Women in Transplantation committee.

Treasured and admired by her colleagues, Josette was also loved and obeyed by her patients, whose care and welfare she valued so highly.

“Words cannot express the dedication, care, assurance and kindness that Josette provided me, both pre and post-transplant. Her weekend visits, her smiling face to monitor my progress and ‘move mountains’ as required will remain in my memory forever.”

Janice Burgess

Renal Department

50
years
1967-2017

Heads of Department 1957 - 2017

Sydney Ralph Reader 1957-1963

John Robert Sands 1963-1973

David Tiller 1973-1997

John Horvath 1997-2003

Josette Eris 2003-2016

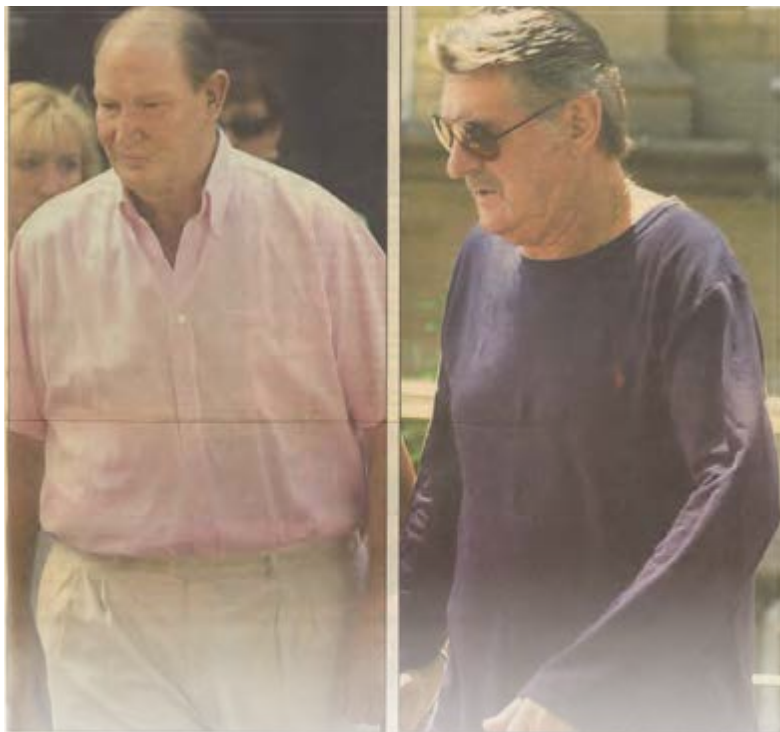
Steve Chadban Present

Theres Jenny & Penny & Helen & Sue
All ready & waiting to Dialyse you
Theres Debby & Rossy & Kay there too
All willing & able to put you thru.
There good & smart & quick as a dart
Taking blood-pressure, Temp. & measure of heart.

Sphygmomanometer

Kerry Packer AC

50
years
1967-2017



Report ... Kerry Packer striding out of hospital yesterday. Photo: Peter Mitchell. Going home ... kidney donor Nicholas Ross left after his break. Photo: John Gonsky.

STRAIGHT TO WORK
AFTER TRANSPLANT

SIX days after receiving a lifesaving kidney transplant from his friend and pilot Nicholas Ross, billionaire Kerry Packer left hospital yesterday — and headed straight for the office.

A minor and short-term injury, Mr Packer was discharged from Sydney's Royal Prince Alfred Hospital around 10pm last night — with the same price of his recovery, however, involving his.

But even that did not stop the media from following him, as he left the hospital in his black 600cc motor, which he had bought for his recovery.

Photo: John Gonsky

KERRY PACKER AC
1937-2005

Transplanted 2000

what part nurture
FEATURES

Conrad
PAGE 3

Pilot's kidney on board, Packer ta



"I chose RPA because, one of the few things in life that money does for you is it doesn't restrict you. So I went and set out to find out who was the best transplant team in the world."

The handling of a transplant is the stopping of rejection. It's the administration of drugs after, and keeping the kidney healthy, alive, functioning, not rejecting, and that's a very special art... and the people at RPA are regarded as good as anyone in the world, and I've checked everywhere in the world."

Packer leaves hospital

By ANNA PATTY, JANE O'NEILL and RUCHI LAMBA

KERRY Packer strode out of hospital early yesterday looking like a man who had a lot more living to do.

Mr Packer, Australia's richest man, received a kidney transplant just six days ago.

And perhaps giving him to why he was so wealthy, the white BMW with the personalised numberplate didn't take him from Royal Prince Alfred Hospital to his Bellevue Hill home — but straight to his Park St, City office instead.

There he met for several hours with senior staff members, including John Alexander, before moving on to his home.

It was a speedy recovery for the man who underwent major surgery

Australian Story - Best of Friends, ABC, 29 November 2001

On the mend: Donor James Jeffrey and Christopher Niesche

WITH a kiss on his forehead, he lumbered out of hospital yesterday.

It was less than a week after Sydney's Royal Prince Alfred Hospital he received the organ from Nicholas Ross, 58.

Flanked by assistants, Mr Packer, 62, walked out of the hospital while security guards followed him.

Although moving to his new home, Mr Packer, a media proprietor who has been healthy, He climbed away to his mansion.

Mr Ross left hospital yesterday, his wife, Mrs Ross, and his two children, Mr and Mrs Ross, were "both well".

Mr Ross, 58, was born in Sydney and lived in the United States. He was a pilot and a businessman.

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Jimmy Little AO

50
years
1967-2017

JIMMY LITTLE AO
1937-2012

Transplanted 2004

TOP OF THE WORLD

to the tune of Top of the World (1972) by The Carpenters

Contentment peace of mind is what we need
Right here at RPA is guaranteed
With the best in loving care, compassions everywhere
For the needy in a-downside quandary.

Everyway we want our health to be
We'll be treated and cared for tenderly
The reason is clear, it's because we are here
For a better healthy lifestyle, worry free.

Chorus:

We're on the top of the world
Looking down on creation
And the only explanation I can find
Is the help that I've found on
this hallow sacred ground
RPA we pray we need you earnestly.

Each and every member on the team
Keeps on building us with hope and self-esteem
Like it was in the past, your legacy will last.

– *Lyrics by Jimmy Little*

A word from our patients

50
years
1967-2017

My fourth chance at life began at RPA Hospital in February 2017 with a kidney transplant. Most people say a transplant is a second chance at life, but I had my first kidney transplant in 1989 and a heart attack in 2011, so this really is my fourth!

Trevor Saunders (transplanted 2017)

One thing for sure, every day I thank God and the people who donated my kidney. Words could not explain the gratitude or thanks that my family and I could give or express. If more people were stuck on kidney machines for a week I am positive that we would have enough vital organs to supply the world. In 2017, I live and I can do things. Thank God, family, surgeons and RPA.

Frank Farrugia (transplanted 2006)

For the last thirty-one years, my health and survival have mostly been in the capable and caring hands of the staff of RPA's renal unit. Despite all the trials, I have always been able to rely on the staff at RPA and I wish to thank them all from the bottom of my heart.

Erika Langereis (transplanted 1986)

A word from our patients

50
years
1967-2017

Some have a smooth road in life, others come across bumps, twists and turns along the way. My journey has not always been smooth but it has been helped along the way by the wonderful doctors and nurses at RPA. Thank you.

Dennis Mather (transplanted 1990)

Thanks to the work of the renal team at RPA, my transplant has been successful. I now live with a clarity, focus and energy I haven't felt for years. I now realise that death is winking at me (and all of us) from just over the horizon but I now have a full and rewarding life in front of me before I reach that horizon.

David (Bill) Forbes (transplanted 2015)

My dual kidney and liver transplant provided me with an opportunity to leave the regime of dialysis after six years and look forward to a new beginning, thanks to the donor family and the care and expertise of all at Royal Prince Alfred Hospital. My transplant has provided me with 16 years of life that would not have been possible to share with my husband, family and friends.

Janice Burgess (transplanted 2000)

50 years of milestones

50
years
1967-2017

2015

1967

June – first dialysis patient at RPA

September – first kidney transplant

1978

First patient to learn **Continuous Peritoneal Dialysis** goes home

1973

First **living kidney donor** transplant

1991

1000 kidney transplants

2007

First **ABO incompatible** kidney transplant successfully performed

100 kidney transplants in a year for first time

2017

RPA celebrates 50 years of kidney transplants and dialysis

2767 kidney transplants

2004

First **laparoscopic donor** kidney surgery

1970

RPA **Home haemodialysis** training begins

RPA Renal Unit provides services to **rural and remote patients** needing dialysis and transplant treatment

1980

RPA renal physicians begin **monthly visits** to Wagga Wagga, Dubbo and later Coffs Harbour

1994

RPA and Concord combined to become **Statewide Renal Services**

Dame Eadith Walker opens as the **home training** and satellite unit for dialysis

2005

Satellite dialysis centre established in Griffith. Outreach services stretch from **Bega to Lightning Ridge**.

2008

2000 kidney transplants

2006

World's first kidney/liver/pancreas transplant using **original technique** performed at RPA

2016

Record 117 kidney transplants performed in one year

A word from our staff

50
years
1967-2017

To have experienced knowledgeable staff, dedicated to helping all patients in a well-resourced environment with a supportive Executive - sounds corny but the point is for a complex disease like renal failure you really do need a team effort from all parts of the hospital system.

John Saunders
Deputy Director, Dialysis

I have been part of the renal unit for nearly 40 years. Why so long? Maybe it's because the unit is like a big, rambling, extended family. Admittedly, as with all families, we don't always agree with each other, often have differences of opinion and may at times seem somewhat dysfunctional. However at the very heart of our unit, we care for and respect each other and our focus is ensuring our patients receive high quality, compassionate care.

Jane Nicolson,
Renal Case Manager

I feel honoured to work with such a great team of people that are dedicated and committed to not only the care of patients and their families but also the support of colleagues. It's a privilege to be part of such an awesome team. These people I count on as not workmates but friends.

Jane Mawson,
Renal Transplant Clinical Nurse Consultant

A word from our staff

50
years
1967-2017

It has been a privilege to have worked in dialysis for the last 37 years – it feels much more like a family than work colleagues. From every level, doctor down to ward clerks, everyone is treated as part of the team and made to feel truly valued. The patients are part of the renal network family also. Unlike some other areas where you may never see them again, some patients I have known for over 20 years and have journeyed with them through dialysis, transplant and back again to dialysis. It is a comfort to them that they are in safe and familiar hands.

Kim Grimley, Nurse Manager,
Statewide Renal Services

It is always about the people. The staff, the patients, the families, and all we come in contact with. It is about the care.

Professor David Tiller AO,
Director, RPA Renal Unit 1973 – 1997

Dialysis

50
years
1967-2017

The renal unit currently cares for over 500 dialysis patients and it continues to see demand for dialysis services grow. Despite the challenges our patients face, the unit maintains its enduring focus on home dialysis married to a philosophy of supporting patients to choose what they think would most suitable for them. As the unit moves into the future, the patient experience of dialysis and the physical environment for treatment and training are at the centre of planning decisions regarding new facilities and services. We envisage the future of dialysis to include activities such as art, education and exercise undertaken during treatments, flexible access to self care dialysis facilities, home training facilities that mimic the home, space and support for careers and loved ones in addition to cutting edge technology all delivered by a dedicated world class team with the aim of providing the best dialysis in every sense to every patient for every treatment.

The future of dialysis

Dialysis technology has changed in many ways over the last 50 years, with advances in materials, water filtration, monitoring systems and the composition and manufacture of dialysate. This has made dialysis safer, more efficient and has allowed for enormous growth in access to long term dialysis. In essence however, it remains very similar to the treatment first described in 1924. Unfortunately removal of excess solutes and water is still only possible during the actual dialysis treatment which is typically 4-5 hours three times per week in a dialysis facility.

One of the biggest challenges in providing dialysis is trying to balance the wishes of patients, who generally want less time on the machine, with trying to improve clinical outcomes, which is usually associated with more dialysis and more time on the machine. Patient preferences and resources are such that spending every day at hospital on a dialysis machine would not be acceptable, practical or possible. A solution to this has been the development of home based dialysis which allows patients greater flexibility with the timing and duration of their treatments. This approach has

always been favoured by our service as evidenced by publications dating from 1969 (Sheil et al, Community treatment of end-stage renal disease by dialysis and transplantation, Lancet 1969; Tiller et al, Home haemodialysis, Medical Journal of Australia 1973) and has since been associated with improvements in several important aspects of care including quality of life and mortality. RPA has a very strong home dialysis program, both for peritoneal and haemodialysis.

Many of the current technological advances soon to be released focus on empowering patients to take ownership of their dialysis and creating a virtual bridge with the parent dialysis unit. These technologies allow for improved monitoring of patients at home, better two way communication, automatic downloading of treatment information, storing, summarising and displaying important treatment related data for patients to track themselves and remote access to dialysis devices to changes treatment parameters. The aim of these technologies is to promote confidence in patients who are dialysing themselves at home, allowing them to track their own progress and treatment and to facilitate easy communication with the parent unit.

Portable, wearable, dialysis systems have been in development for many years and finally are undergoing clinical trials. Systems are available using both HD or



APD techniques. They use sorbents to absorb toxins from the blood. In doing so the dialysate can be reused which means only a small volume is required and that is what makes the system portable. Wearable dialysis units can potentially greatly increase time on dialysis, which could improve quality of life and outcomes for patients, although this has not yet been studied in any great detail. One of the major downsides to the wearable dialysis devices is the weight and bulk. A device that could be implanted would solve some of those issues and although there are two approaches to this that are being developed, both are only in very early stages and are still many years away from being used in routine clinical practice.

The first dialysis was performed at RPA in June 1967 in a small annex of the hospital. Acetate was used for the dialysate buffer and vomiting, headaches and severe cramping was common, keeping the nurses busy with vomit bowls and rubbing patient's legs.

Dialysis machines were quite simple, looking very much like large washing machines and a good dialysis nurse always had her trusty screwdriver on hand to fix basic technical problems. Fluid removal was via a G-clamp placed on venous blood line to increase the pressure in the artificial kidney, care being taken not to tighten too much or face the consequences of patients going very 'flat' or dialysers bursting.

Renal diets were also simple – high protein, no salt or potassium, and every patient knew what their daily fluid restriction was – 500mls plus previous days urine output and beware the nurses and doctors wrath if they exceeded it.

Access consisted of external shunts, plastic tubing placed directly into a vein and an artery and the two pieces joined together by a connector – nurses had to be very careful to ensure the lines were clamped before they separated them otherwise it

could be very messy with blood squirting everywhere – you only made that mistake once!

Peritoneal dialysis was performed at RPA from the 1960s via a hard 'stick' catheter and needed to be done hourly for 48 hours. This restricted the patients to beds and kept the nurses busy when there were three patients – no sooner had one cycle finished and another one was started. It was a red letter day when continuous ambulatory dialysis (CAPD) was introduced and cycles could be 4-6 hours. Patients could now be mobile and peritoneal dialysis done at home.

50 years on and the RPA renal unit has 45 high tech, safety conscious, dialysis machines (no screwdrivers required) which allow for treatments to be individualised. Bicarbonate is the buffer of choice (no more vomiting) and fluid removal is just a push of a button, Arterio-Venous Fistulas (AVF) are now the access of choice with central venous catheters being used for patients with acute kidney injury or when an AVF is not possible.

Times have changed, dialysis has evolved but the team of dialysis nurses continue to provide patient focused care.





50
years 1967-2017

of kidney transplantation
and dialysis

Transplantation

50
years

Since the first kidney

transplant was performed at RPA in September 1967, RPA has gone on to become a leading transplant centre not only in Australia but worldwide. Over 50 years, the number of patients we transplant each year has grown from less than 10 in the early years, to 60-80 each year from the 1980s, increasing to over 100 today.

Our growth has been driven by an ever-increasing number of people with end-stage kidney disease who would be better off transplanted than dialysed. Our ability to provide transplantation for our patients has always been constrained by an inadequate supply of donor kidneys to satisfy demand. The increase in activity over the years has been enabled by strategies to expand the number of kidneys available for transplantation, including our strong living donor program maximising use of living donors through innovations such as blood group incompatible transplants and the Australian Paired Kidney Exchange, and more recently through collaboration with Government initiatives coordinated by the Australian Organ and Tissue Authority and the Transplantation Society of Australia and New Zealand, to successfully increase

the number of Australians who donate their organs after death. Such strategies have enabled us to perform 2767 kidney transplants over 50 years, including 730 from living donors since 1973.

Outcomes for kidney transplant recipients are among the best in the world. Patients transplanted at RPA have a 98 per cent probability of surviving the first year after transplantation, and of these 98 per cent will have a functioning kidney and be free from dialysis. We attribute our success to our team-based approach, where transplant physicians, surgeons, nurses, allied health and administrative teams work in a collaborative and consultative environment. Our team reaches beyond RPA and enlists input from a much broader circle of clinicians from Liverpool, Canberra, Wagga, Dubbo, Coffs Harbour and other centres which provide care for patients both before and after transplantation. Our endeavours are strongly supported by our executive at RPA and Sydney Local Health District, who see organ donation and transplantation as genuine health priorities.

To achieve excellence and remain at the cutting edge of clinical transplantation, our unit has followed principals that remain as important today as in 1967:

- Practising evidence based medicine, by contributing to guideline generation and use within the unit and by keeping up with latest research
- Participation in research. We undertake research in transplant immunology, run numerous clinical trials and conduct registry analyses. We encourage participation for all patients and all staff.
- Data driven strategies are encouraged through provision and analysis of data, using the ANZDATA registry and local data bases
- Conferences showcase and discuss the latest science in transplantation and we encourage staff participation at key conferences
- We are very well represented on Government committees and peak professional bodies which we believe is important to keep us connected and to advance the agenda of renal transplantation
- Teaching patients and staff is an integral component of our service.

Transplantation surgery

50
years

Fortunately, we can still find

the participants involved in the first kidney transplant in September 1967. Professor David Tiller AO and Professor Jim May AC, pictured, beside a portrait of Professor Sir John Loewenthal.



Loewenthal became Professor of Surgery at the University of Sydney at RPA in 1955 and deserves credit for raising the profile and quality of surgery in Sydney. He encouraged surgical and medical colleagues to undertake collaborative research in a broad span of specialty interests and used his international contacts to find training opportunities for his protégés. Four of these young surgeons, AG Ross Sheil AO and Jim May as vascular surgeons, and Brian Storey and John Rogers as urologists, became key figures in establishing kidney transplantation surgery at Sydney Hospital and RPA. Their legacy continues 50 years later.

In 1967, long term dialysis was not a practical option because of the limited availability of haemodialysis machines in Sydney, and hence, the need for kidney transplantation. Prince Henry Hospital in Little Bay started their program in 1965. Initially, only one kidney was retrieved from a deceased donor because of the need to use after-hours operating theatre time and the 12 hour long tissue typing process.

Ross Sheil undertook the first kidney transplant procedure at Sydney Hospital on 19 August 1967. Loewenthal's solution was to arrange for two transplanting hospitals to be involved for each donor. On the evening of 17 September 1967, Jim May and Brian Storey performed the first kidney transplant at RPA whilst Ross Sheil transplanted the other donor kidney at Sydney Hospital. Jim May had not previously transplanted a kidney but had been involved in large animal model research in USA. As a result, he felt confident in his surgical skills. He can still recall his delight in seeing urine being produced within minutes of re-vascularising the donor kidney. Very little has changed in the subsequent 50 years.

Vascular surgeons and urologists have remained an important component of the delivery of renal replacement therapy



at RPA. As dialysis machines became more prevalent, reliable vascular access created by surgeons provided a lifeline for patients whilst waiting for a kidney transplant. The urologists ensure that urine gets from the transplanted kidney to the outside world and are involved exclusively in the living donor nephrectomy. Since 2003 at RPA, the latter has become very much a specialist operation involving laparoscopic techniques to minimise donor discomfort and promote early return to leisure activities and work. Deceased donor surgery was also the domain of the urologists, many of who worked in The Gordon Craig Research Laboratory at RPA, until multi-organ procedures

became the norm for 1986. Specialist transplant surgeons are now involved in all deceased donor organ retrieval procedures and transplant operations. Our current transplant surgeons, Dr Deborah Verran and Associate Professor Jerome Laurence, led until 2016 by Professor Richard Allen and supported by Associate Professor Charbel Sandrussi, Dr David Joseph, Dr Raffi Qasabian, in collaboration with our transplant Urologists Dr John Boulas, Dr Arthur Vasilaras, Dr James Wong, Dr Scott Leslie and Dr David Eisenger, provide a surgical transplant service that is second to none on a global scale.

In the early years of renal medicine, procedures, treatments and management strategies required formulation and research was seen as the best way to define them. The RPA Renal Unit has conducted and published an astonishing amount of research from 1967 which underpins the current practice of nephrology. This research has ensured that RPA remains at the cutting edge of nephrological science and patient care. We have a strong belief that research should be increasingly incorporated into our daily practice and that all patients and staff should have the opportunity to participate. Translation of research into practice through guideline development and uptake to ensure evidence based practice is a key principal of the unit. Our work is supported by our administration and colleagues at RPA, NHMRC Grants (continuous funding since 2005), funding from Kidney Health Australia and industry and by donations from our patients through the RPA Transplant Institute, Department of Renal Medicine and University of Sydney. *We are grateful to all of our supporters.*

Transplantation research

Research output flowed rapidly following the start of transplantation at RPA in 1967. Publications on “Renal Transplantation from Cadaveric Donors” (Sheil et al, Medical Journal of Australia 1968) signalled the unit’s intent and philosophy. “ABO Incompatible Renal Transplantation” (Shiel, Tiller et al, Transplantation 1969) highlighted this important aspect of immunity in transplantation, a subject that was revisited in 1996 (Mackie and Tiller, ANZ Journal of Medicine) and in 2007 with the

commencement of the highly successful ABO-incompatible transplant program at RPA. From the 1970s, the RPA team conducted pioneering work in the field of immunosuppression. Use of monoclonal antibodies, ingeniously made in-house, showed potential to prevent rejection (Sheil et al, Lancet 1973). Work at RPA on the then novel molecule Cyclosporin A helped define its actions and toxicities in the clinic (CSA and oliguria, Lancet 1981; CSA and fibrosis, Lancet 1984; Gout and CSA, Lancet 1985) and mechanisms of both in

the lab (CSA toxicity, Transplantation 1986, Kidney International 1985), culminating in the Australian CSA Trial, originally published in the New England Journal by Hall, Tiller et al, (1988) and again with long-term follow-up by Gallagher, Eris et al in Transplantation (2004). Insights into the immunobiology of kidney transplant rejection (in particular the role played by intrinsic kidney cells by Hall, Duggin, Tiller et al) and how to diagnose rejection by biopsy (Lancet 1986, KI 1986) also had significant global impact.

Early focus on issues which are now the centre of international attention, such as machine perfusion of donor kidneys (Sheil et al, Lancet 1975), risks of cancer and infertility after transplantation and patient perspectives (Patient attitudes to Xenotransplantation, Tiller et al, Lancet 1997) highlight the remarkable vision of the transplant group.

Research drives better practice and better outcomes for patients and remains a key priority for the transplant unit today. Current clinical research efforts focus on immunosuppression trials, diabetes after transplantation and development of donor specific antibodies. Our clinical service is integrated with our research lab, where our focus is on targeting innate immunity to promote transplant tolerance in the hope of ultimately freeing our patients from the problems associated with lifelong immunosuppression.



Dialysis research

The renal unit has always believed in home dialysis. The publication “Community treatment of end-stage renal disease by dialysis and transplantation” (Shiel et al, Lancet 1969) outlined that philosophy and was followed by subsequent publications (Home haemodialysis, Tiller, Stewart et al, Medical Journal of Australia 1973; Universal home haemodialysis, George CG, Lancet 1983). Clearance of vitamins and medications on dialysis (Duggin et al, MJA 1989) and timing of dialysis initiation (IDEAL trial, NEJM 2010) have been other important research contributions from the unit.

Chronic kidney disease research

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years

Molecular dissection of

the mechanisms causing Analgesic Nephropathy (Duggin et al) provided evidence used to support a ban on compound analgesic usage in Australia, subsequently leading to the near elimination of this important cause of kidney failure in this country. Work on lithium nephrotoxicity and acute kidney injury followed, also leading to practice change.

Research at RPA by Horvath, Duggin et al was seminal in defining and understanding the role of the kidney in driving hypertension and specifically

the role of the renin-angiotensin axis. This work led to establishment of a clinical service for assessment of the renin-angiotensin axis and underpinned one of our current therapeutic strategies in managing hypertension.

Diabetic nephropathy and acute kidney injury (ischaemia reperfusion injury) remain active areas of research within the Department and the Kidney Node, Charles Perkins Centre, University of Sydney, where we are attempting to define the burden of kidney disease in the community, find new therapeutic targets in the lab, then translate them into clinical practice.

Kidney donors

To quote the first line from the Introduction to Kidney Donation by Live Donors, “live kidney donation is a gift by choice and not by chance”. Living kidney donors have been an important part of the RPA Transplant Program since 1973. In the 1970s, RPA did 15 live donor transplants, which rose to 298 last decade and since 2010, we’ve performed 240 living donor transplants. The advent of laparoscopic surgery and blood group incompatible transplants saw more living donors coming forward.

Our government has acknowledged the immense gift a living donor provides with the commencement of the Supporting

Leave for Organ Donor scheme. Pre-emptive transplants have always accounted for approximately 40 per cent of live donor transplants.

An important event in the RPA calendar is the annual Gift of Life remembrance and thanksgiving ceremony which includes recognition of living donors who are presented with a certificate and star pin to acknowledge their act of human kindness. This certificate and pin was developed by a group of NSW coordinators. Living donors and recipients reflect on their donation and transplant process but mostly the day is a celebration for donors, recipients, families and all staff involved.



Maternal Medicine

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years



The unit's involvement with maternal medicine was started by Professor John Horvath, ably aided by Sister Wendy Fischer in collaboration with Dr Andrew Childs (Department of Obstetrics and Gynaecology) and Dr David Henderson-Smith (Department of Neonatology).

The service primarily cared for women who had developed pre-eclampsia during their pregnancy. In addition to clinical care, research was a major focus of the collaboration and a focus that has continued to this day. The unit has been successful in receiving multiple research grants to support both clinical and basic research. At a very early stage, the unit recognised a need to undertake research with primates to enable translational research and with attainment of funding from the NHMRC, University of Sydney

and other sources, this was established by the late Dr Andrew Phippard. This has resulted in multiple doctorates assessing the physiology of pregnancy in primates, and is currently led by Professor Annemarie Hennessy.

The renal unit continues to maintain the strong clinical relationship with the Obstetrics Department. We continue to review pregnant and early-postpartum women at our Hypertensive Disorders of Pregnancy Clinic, and provide inpatient management of pregnant women with hypertensive issues, as well as being involved in multiple clinical research collaborations.

Providing services to the bush

The RPA Renal Unit first

began providing services to individual rural and remote patients needing dialysis and transplant treatment in the 1970s. Patients were treated with home dialysis, supported by remote visits by dialysis technicians, and had to travel to Sydney for their outpatient review, investigations and procedures.



In the 1980s, with increasing numbers of patients from the bush developing kidney failure, physicians from the unit began regular monthly visits to Wagga Wagga and Dubbo, and later Coffs Harbour. These visits provided regular outpatient review of patients with early kidney disease, those maintained on dialysis and transplantation. This later expanded to include visits by the transplantation assessment team, including nurses and surgeons, reducing the demands on patients and their families for time, travel and expense. With increasing numbers suffering kidney failure the unit was involved in the development of local satellite dialysis, with services being built in Wagga Wagga, Dubbo in the 1990s and

Griffith in 2005. It also pioneered the return of remote Indigenous patients to their homes, using the model of home haemodialysis with the machine located in local hospitals, a model now widely used in rural and remote NSW. Brewarrina, the first location in which this model was applied, had grown from a single machine to a five-station dialysis unit between 1993 and 2003, reflecting the increasing burden of disease in the Indigenous and rural populations.



By the mid-2000s the unit provided outreach services reaching patients from Bega in the south to Lightning Ridge in the north. Regular visits by specialists were supported by renal registrars to meet the ever-increasing demand for services. Having been exposed to rural and remote medicine several of our registrars have now moved to live and work in Dubbo and Wagga Wagga, reducing the demands on the RPA service but maintain the link to rural and remote nephrology that has been and continues to be a focus for our unit.

Viruses and the kidney



The landscape in renal transplantation for patients with chronic viral infections including hepatitis C, hepatitis B and HIV has completely changed, with rapidly evolving novel therapies now widely available to treat these infections and allow for successful renal transplantation in these patients. Previously these infections were thought to be absolute contra-indications to proceeding to renal transplantation with fears that immunosuppressive medications required in the post-transplant period to prevent rejection would result in an uncontrollable flair of the known underlying viral infection.

A standardised approach is now used at the RPA renal transplant unit to assess these patients for transplant suitability, and many patients on therapy have now been successfully transplanted with excellent outcomes.

Our outcomes for HIV-infected kidney recipients are similar to those reported in

Europe and the United States of America, with a slight increase in rejection, but no difference in longer-term outcomes to the non-infected patient group, overall. Also, recently kidney donors with chronic hepatitis B and chronic hepatitis C have been considered for use. Donors with known hepatitis C who have previously been successfully treated with anti-viral agents have been used at our unit; the risk of transmission of the hepatitis virus seems negligible and our outcomes so far have been excellent. The use of these donors results in an expanded donor pool, allowing increased access to renal transplantation for many patients and permitting access to living kidney donation for patients whose donors were previously thought to be medically unsuitable.

As a centre specialised in assessment and management of viral diseases, we are engaged in research and education in the area seeking to promote uniform best practice in this area across Australia.

Diabetes and the Kidney

Diabetes is the fastest growing chronic condition

in Australia with approximately 1.7 million people affected. Kidney disease develops in approximately 30 per cent of all people with diabetes and consequently diabetic kidney disease is the most common form of chronic kidney disease in the general community and also the most common cause of end-stage kidney disease requiring treatment with dialysis or transplantation. Research from our unit in collaboration with the AusDiab Study team has highlighted how common diabetic kidney disease is in Australia and how much it costs our society. Both chronic kidney disease and diabetes are strong risk factors for heart disease and the combination of the two places our patients at very high risk of death from heart disease. Indeed, premature death due to heart disease or stroke is a more common outcome than progression to dialysis or transplantation for people with diabetic kidney disease. Outcomes for patients with diabetic kidney disease have improved significantly over the last 10 years with slower disease progression mainly due to use of medications that reduce kidney damage.

Kidney transplantation offers the best health outcomes for people with end-stage kidney disease caused by diabetes and research from our team in collaboration with ANZDATA show we are transplanting increasing numbers. One drawback is that the medications used in transplantation can further increase blood sugar in those with existing diabetes and cause new onset diabetes in up to one third of non-diabetics who receive a kidney transplant. Diabetes increases the risk of complications after transplant including long term heart disease.

Given the size of the problem of diabetic kidney disease, our unit will continue to focus on this problem both clinically and in research. We are currently working on novel methods of continuous glucose monitoring 'around the clock' in a bid to better guide our treatment of diabetes after transplantation, whilst in the lab we are working to determine how diet can be used to modify the gut 'microbiome' in a bid to retard the development of kidney disease in people with diabetes.



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years 1967-2017

of kidney transplantation
and dialysis

The Renal Service commenced at Concord Hospital under Dr Richard Evans, with renal diagnostic laboratories opening in 1967, staffed by two scientists. The first dialysis treatment given to a patient was in 1968 using an in-centre multi-patient machine. Home dialysis was offered soon after this, and remains a major focus of both the Concord and RPA renal units. Home training eventually moved to the Dame Eadith Walker Estate servicing patients from both hospitals. Renal transplants began in 1976, under the supervision of Professor Jim Laurence and Dr Charles George, who had been the first Renal Registrar at Concord in 1969. In 1993, Concord Hospital transferred from the Federal Repatriation Commission to the NSW State Government which led to the amalgamation of the renal units at Concord and RPA. The last renal transplant at Concord was performed in 1997, with all acute transplant services moved to the RPA campus thereafter. Home dialysis training also moved to its current site at RPA in 2010.

In the last five years, there has been a massive expansion of renal services provided at Concord Hospital. With the support of Sydney Local Health District, the outpatient clinic load has increased over 300 per cent, with commensurate increases in medical and nurse staffing, and dialysis chair numbers have increased from 12 to 30. As part of a coordinated approach to renal services across the District, outpatient allied health support has grown at both sites, investments aimed at standardising patient care, targeting of renal risk factors, early preparation for dialysis with a goal of prioritising home dialysis, and renal supportive care pathways.

Further sharing of services between sites has also culminated in the recommencement of home haemodialysis training at the Concord campus in 2017. To respond to the burgeoning demand for renal replacement therapies, the renal units at both hospitals continue to work together to meet the needs of the District's population.





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and dialysis

