2024


# ANNUAL REPORT 2024

## Department of Renal Medicine
## St George Hospital

W: stgrenal.org.au

NSW GOVERNMENT Health
South Eastern Sydney
Local Health District

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# 1. INTRODUCTION

On behalf of the team I present the 2024 Annual Report of the Department of Renal Medicine, St George Hospitals. I wish to thank everyone in our department for their contributions to this report and to the ongoing care of our patients.

2024 witnessed the successful bid for the **Renal Net Zero Hub** at St George Hospital, led by **Dr Alexandra Gallagher** and **Helen Veros (RN)**. Their brief is to develop and implement scalable environmental projects to reduce the CO2 footprint of Renal Services, funded by NSW Government. They have been busy optimising our water recycling program, introducing novel cannulation processes to reduce waste, working towards centralised acid delivery, and spreading the word, to name but a few projects. We launched our **Renal Genetics Service** in 2024 with the support of the Department of Clinical Genetics aiming to optimise precision diagnosis and treatment of kidney diseases. The future of these services is exciting.

Pages 6-8 highlight the key findings from our report. In brief, our dialysis patient numbers have dropped slightly whilst our transplant patient numbers continue to climb. A challenge to all departments is promotion of home therapies, as demonstrated on page 6. Our department continues to promote a "*peritoneal dialysis first"* policy, however, our home dialysis numbers have fallen in recent years (PD 55 to 36 and home HD 53 to 22 between 2009 to 2025).

We have demonstrated excellent patient survival for all dialysis patients. Our transplant patient outcomes have improved and are above Australian comparators. Our department is immensely **grateful to the Renal team at POWH** with whom we manage these patients collaboratively. We have been able to control or improve symptoms well for patients on dialysis and non-dialysis pathways with our Kidney Supportive Care service.

Preparation for dialysis through our pre-dialysis education program is increasingly successful and necessary for patient-centred goals in the management of ESKD. The vascular access program has achieved primary access rates that remain higher rate than the national average. These data are discussed regularly within our department to ensure we maintain the highest standards of care. The M&M process is formalised as a regular quality improvement activity.

It should be noted that many of our teams and programs are headed by inspired, highly trained, dedicated, and caring Clinical Nurse Consultants and other Senior Nurses, to whom I am very grateful.

I welcome any feedback.

**A/Prof George Mangos**
**Head of Department, Renal Medicine**
**george.mangos@health.nsw.gov.au**

# 2. DEPARTMENTAL STAFF

## *Head of Department*

A/Professor George Mangos

*Reports to*
Director, Division of Medicine

## *Nephrologists*

Prof Sunil Badve (Medical Lead, Research)
Professor Mark Brown (Head, Homeless Health Department)
Dr Alexandra Gallagher (Medical Lead, NSW Renal NetZero Hub)
A/Prof Ivor Katz (Medical Lead, Chronic Kidney Disease)
A/Prof John Kelly (Medical Lead, CKD transition and pathways)
Dr Karen Keung (cross appointment POWH, Director of Transplantation)
Dr Cathie Lane (Medical Lead, Thursday education program)
Dr Kelly Li (Medical Lead, Kidney Supportive Care)
Dr Franziska Pettit (Medical Lead, Peritoneal dialysis)
Dr Parthasarathy Shanmugasundaram (Medical Lead, Renal Genetics, Medical Lead, Renal Biopsy training program)
Dr Brendan Smyth (Medical Lead, Haemodialysis )

## *Clinical Nurse Consultants*

Tania Burns, CNC Kidney transplantation
Jason Catiwa, CNC Vascular Access
Claire Cuesta, CNC Peritoneal Dialysis
Elizabeth Josland CNC Kidney Supportive Care
Yanella Martinez, CNC Vascular Access
Alison Smyth, CNC Kidney Supportive Care
Kylie Turner, CNC Chronic Kidney Disease

## *Nursing Unit Managers*

Tracey Blow, Manager, FKC Dialysis centre (FMC employed)
Evelyn Graf, NUM Ward 4 West incentre dialysis
Louise Jordan NUM Sutherland Dialysis Centre
Darren Lake, NUM Ward 4 South

## *Clinical Nurse Educations*

Vu Nhu Tai Pham (Ward 4 South)
Kristy Roh (Ward 4 West)

## *Clinical Nurse Specialists*

Jennifer Beddoe (CNS hypertension)

Maria De Rueda (Peritoneal dialysis)
Myrna Mique (CNS dialysis)
Rathi Naduvathery (CNS dialysis)
Saiyini Pirabhahar (Clinical Scientific Officer)
Fiona Robinson (Peritoneal dialysis)
Gopika Sekhar (CNS dialysis)
Thara Sreedharan (CNS dialysis)
Blessy Thelliyil Joy (CNS dialysis)
Emma Vella (Peritoneal dialysis)
Helen Veros (CNS dialysis)
Tamison Waghorn (CNS dialysis)

### *Clinical Trials*

Tamison Waghorn (RN)
Giyeon Kim (RN)

### *Kidney Supportive Care*

Xiaobing Ma (Renal Supportive Care Clinical Manager)
Skye Xu (RN)

### *Administration team*

Maria Karagiannis (AO5)
Georgia Civils-wood
Jodie Hendley
Kathy Karagiannis
Noelene Keen
Harris Stavros

### *Allied Health - Nutrition*

Maria Chan (Senior Renal Dietician)
Jessica Dawson (Senior Renal Dietician)
Maya Young (Renal Dietician)

### *Allied Health – Social Work*

Danielle Horne (Renal Supportive Care Social Work)
Jennifer Pendlebury (Renal Social Work)
Kiahne Snellgrove (Renal Social Work)

# 3. ESKD ACTIVITY OVERVIEW (ANZDATA)

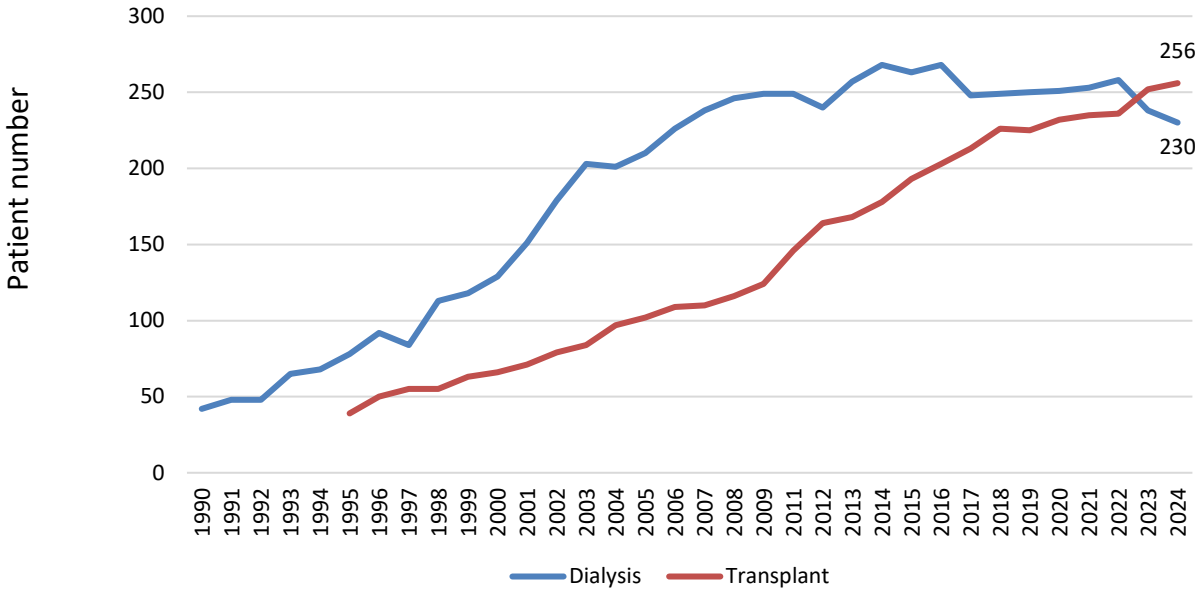



*Figure 1. All Dialysis & transplant patients 1990-2024 (ANZDATA 31/12/2024).*

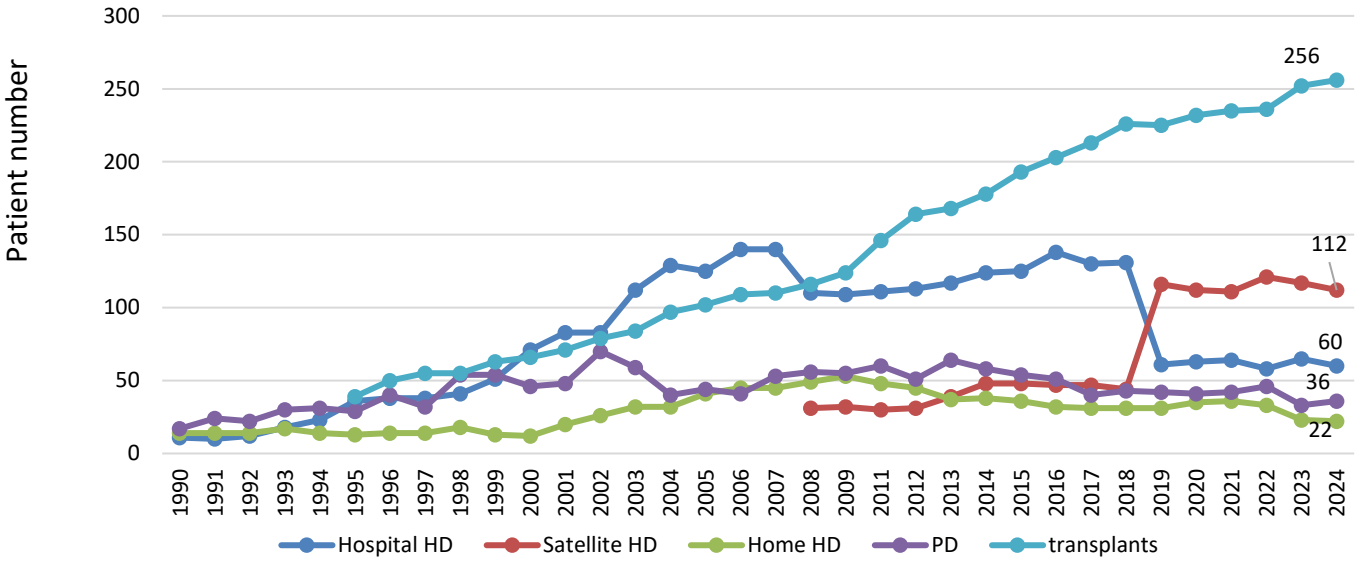



*Figure 2. Dialysis & transplant patients 1990-2024 (ANZDATA 31/12/2024) NB. Sutherland Satellite unit opened in 2008, St George Satellite unit opened 2019.*

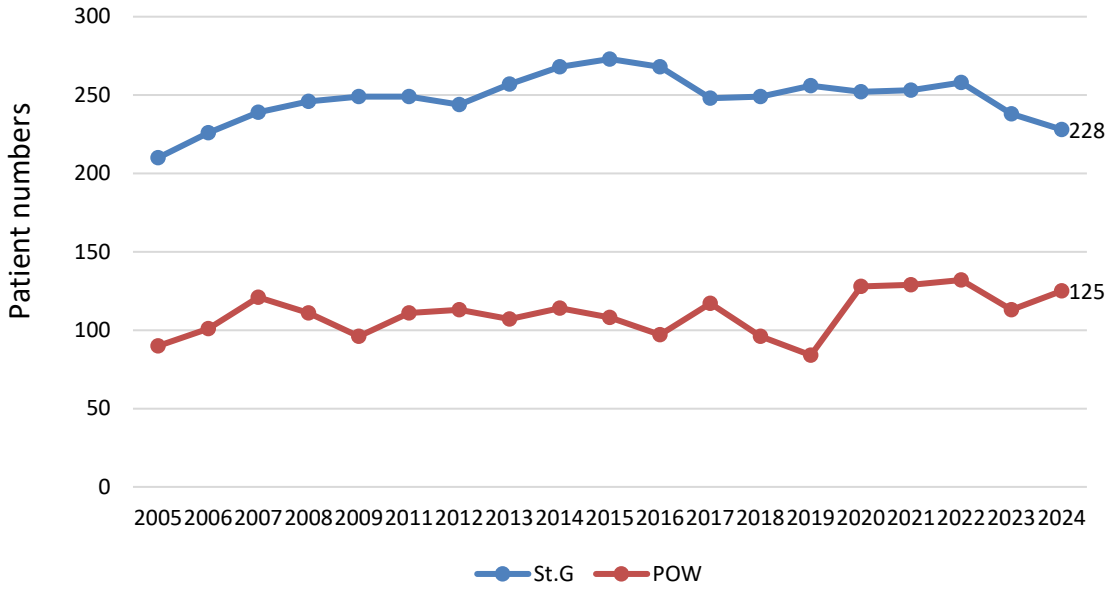



*Figure 3. Dialysis patients South East Sydney LHD (ANZDATA 31/12/2024).*

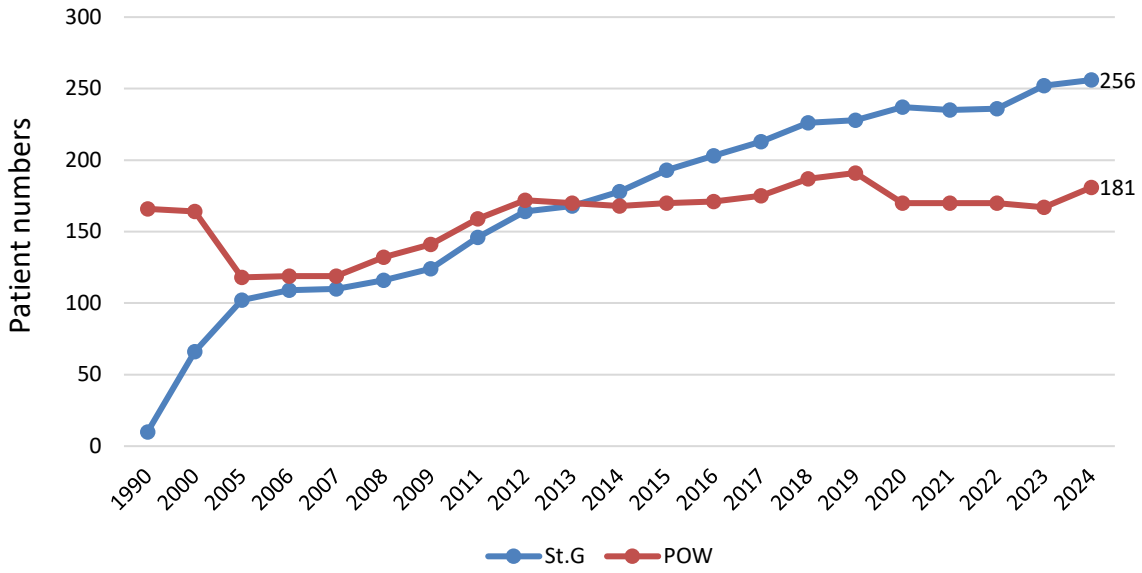



*Figure 4. Functioning Transplants South East Sydney LHD (ANZDATA 31/12/2024).*

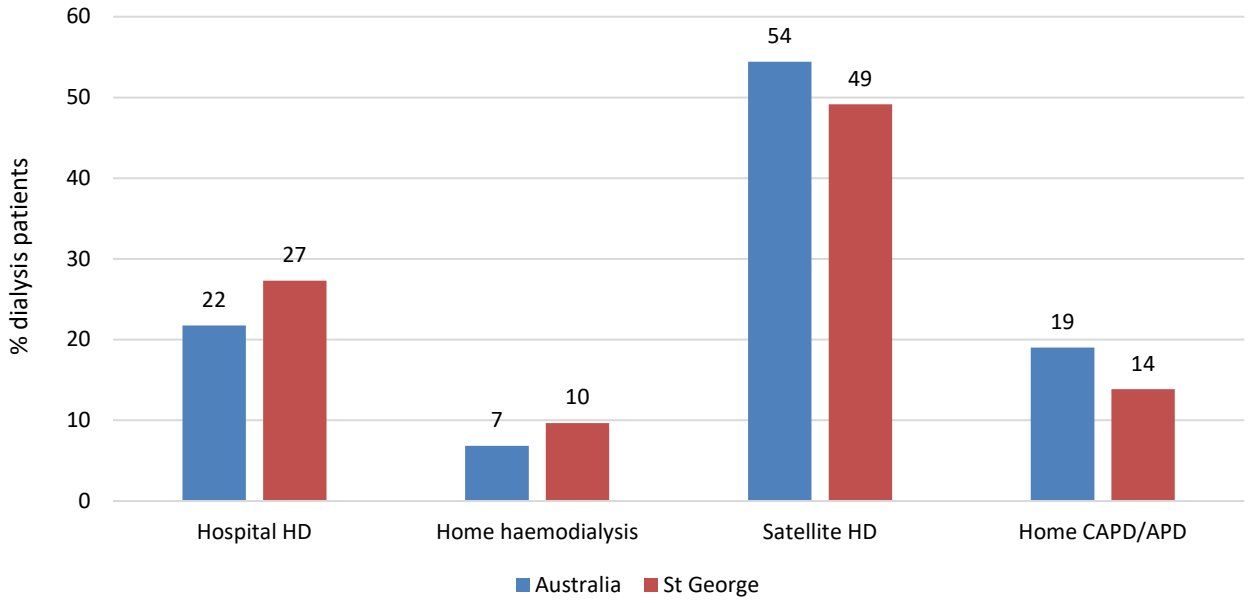



*Figure 5. Mode of dialysis Australia & St George 2024 (ANZDATA 31/12/2024).*

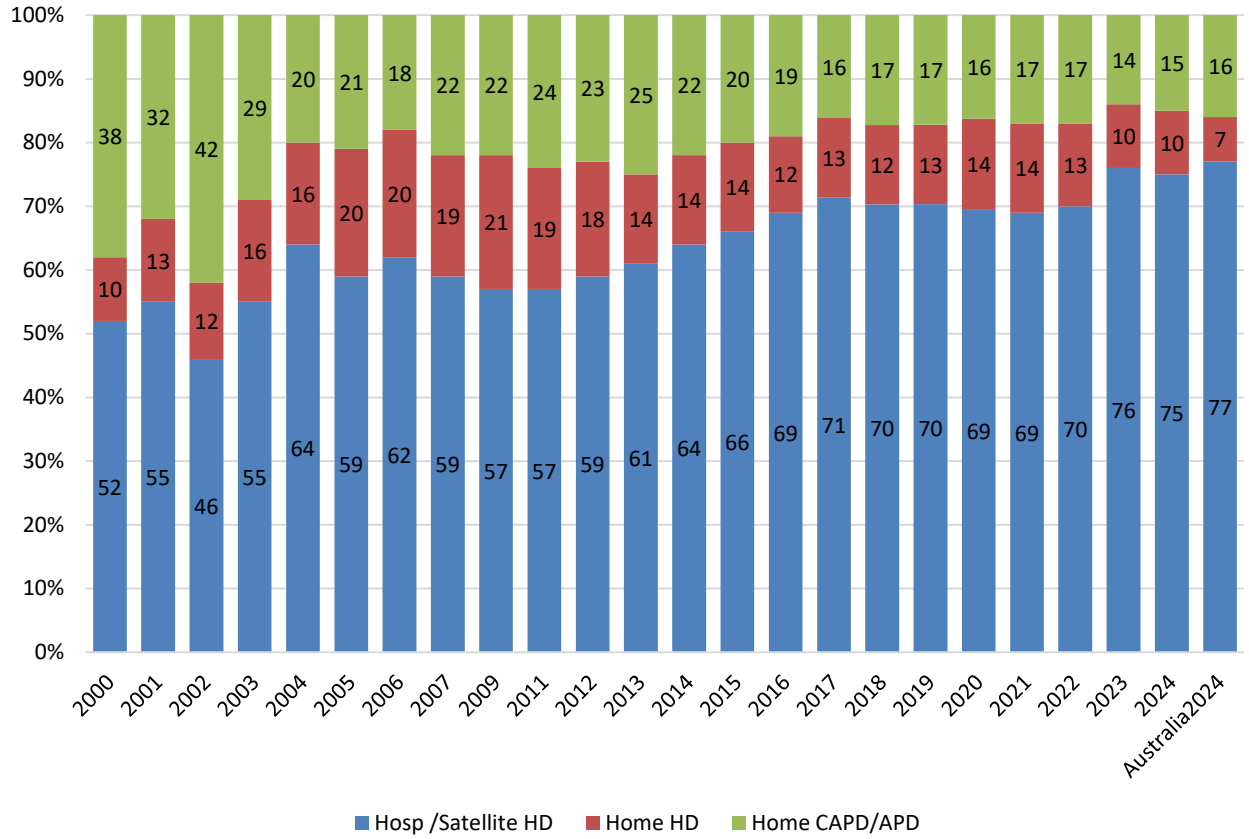
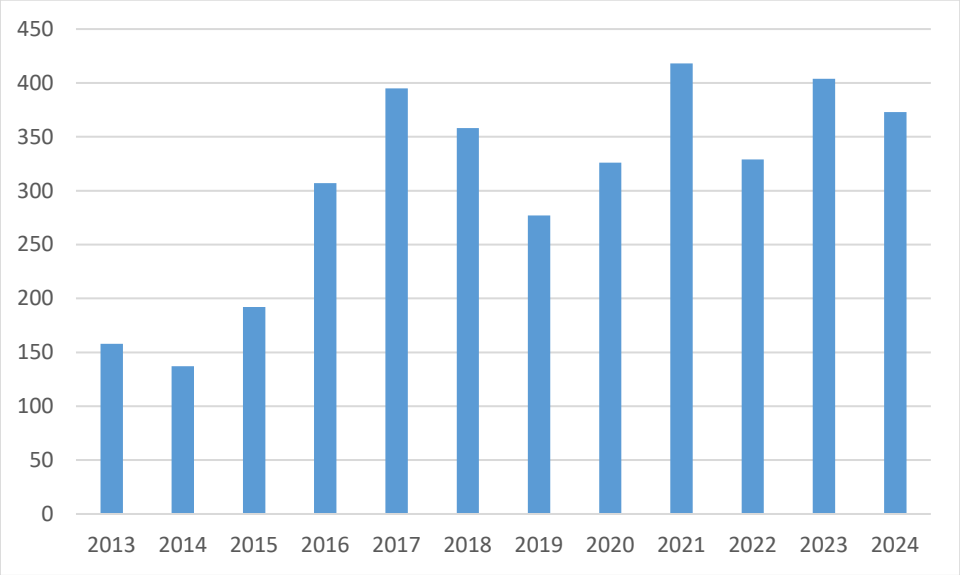



*Figure 6. Mode of dialysis Australia & St George 2024 (ANZDATA 31/12/2024).*

# 4. CHRONIC KIDNEY DISEASE – OUTPATIENT REFERRALS

**Kylie Turner, Saiyini Pirabhahar, A/Prof Ivor Katz**

In 2024, a total of 373 new referrals were received to the renal outpatient department which was 8% decrease than from the previous year.




*New Patients seen in Renal Outpatient Clinics 2013-2024*

We run 17 clinics per week over 3 sites at St George Hospital. In 2024, **there were over 10700 outpatient visits** to renal clinics run by doctors, nurses and allied health staff.

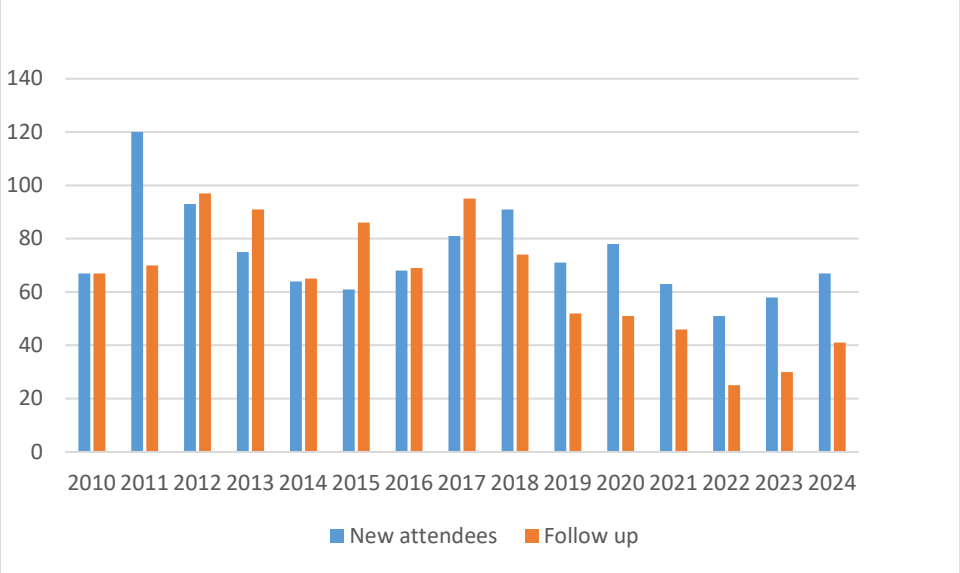
# 5. ADVANCED KIDNEY DISEASE AND PRE-DIALYSIS EDUCATION CLINIC

**Kylie Turner, A/Prof Ivor Katz**

**Activity summary**

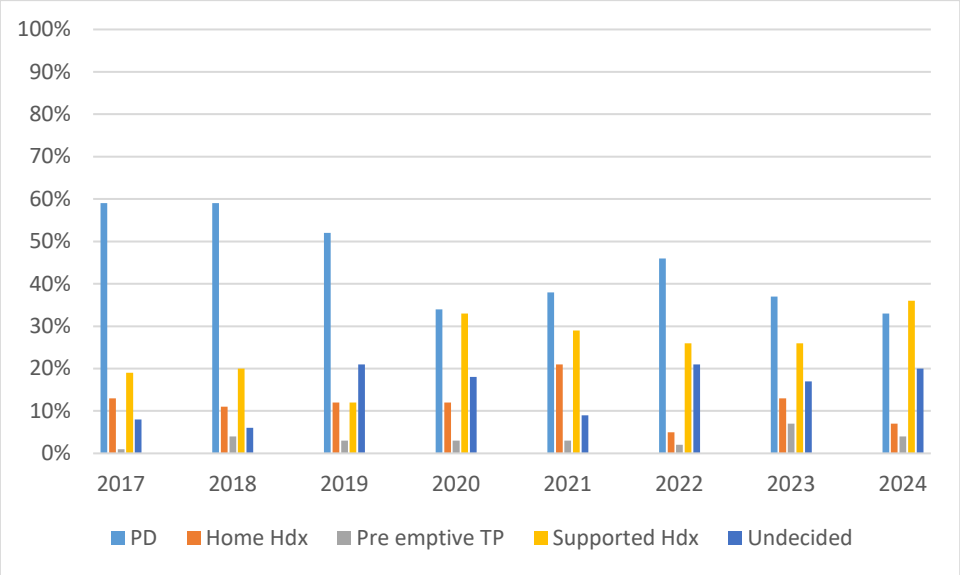
The Renal Department guideline for referral to the multidisciplinary Kidney Disease Education Clinic is eGFR ≤ 15 or dialysis predicted in the following year. As of December 31st, 2024, there were ***96 patients active within the Kidney Disease Education Clinic with a plan for renal replacement therapy***. This was a 4% decrease from the previous year.

Since April 2002 there have been 1456 people who have attended the clinic. In 2024 sixty-seven new patients attended the Kidney Disease Education Clinic compared to 58 new attendees in 2023. There were 41 follow up appointments compared to 30 follow up appointments in 2023.




*New attendees and follow up numbers for 2010-2024*

The age range of new patients seen in 2024 was 40-83 years. The average age was 69 years.
There were 45 (47%) patients with eGFR <15 active in the Kidney Disease Education Clinic at the end of 2024, with 54 patients at the end of 2023. Below are the percentages of those patients and their chosen treatment pathways.




*Percent of patients with eGFR <15 active in Kidney Disease Education Clinic and chosen treatment pathway*

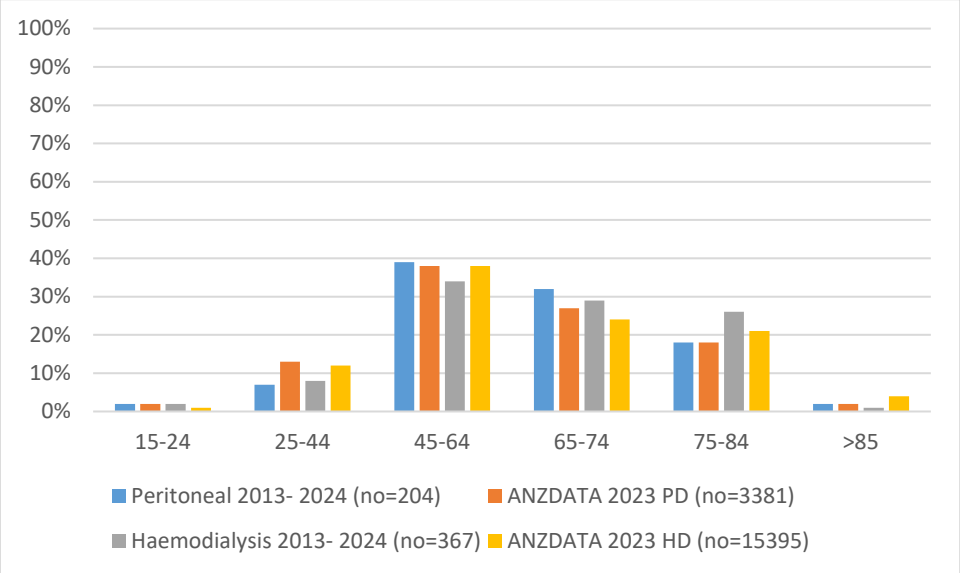
# 6. ACCEPTANCE ONTO DIALYSIS

**Kylie Turner, A/Prof Ivor Katz**

**Activity summary**

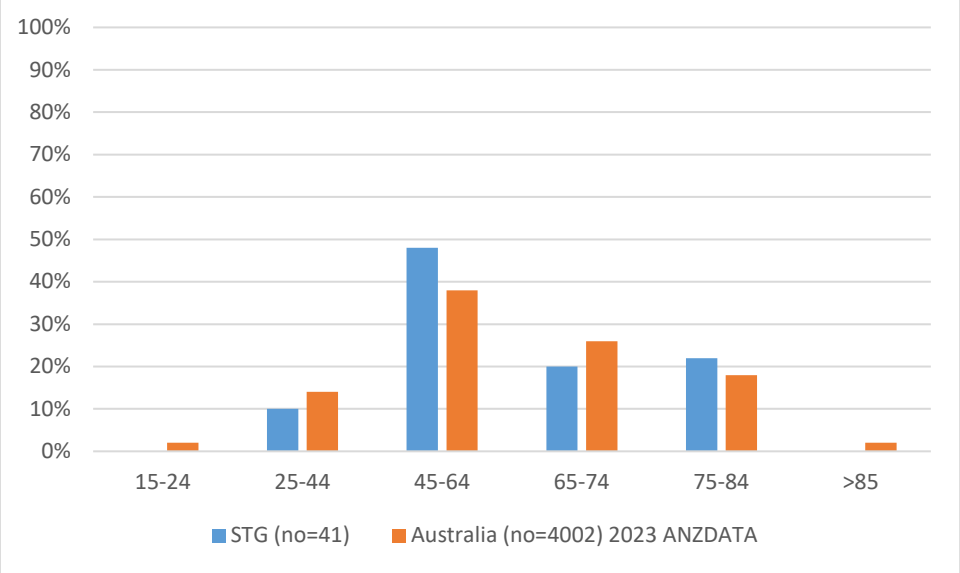
Of 40 new patients who started dialysis in 2024, 15 (38%) patients commenced peritoneal dialysis, 25 (62%) started haemodialysis. Patients were analysed according to their first mode of dialysis.

- There were 6 (15%) late referrals, similar to the National average 2023 (15%).
- Mean age at commencement in 2023 was 63 years for peritoneal dialysis and 64 years for haemodialysis. The average age of patients starting haemodialysis and peritoneal dialysis was the same as the previous year. The average age of patients nationally commencing HD is 62yrs and for PD 58yrs (ANZDATA 2023).




*Age Groups of New Patients 2013-2024 compared to ANZDATA 2023*

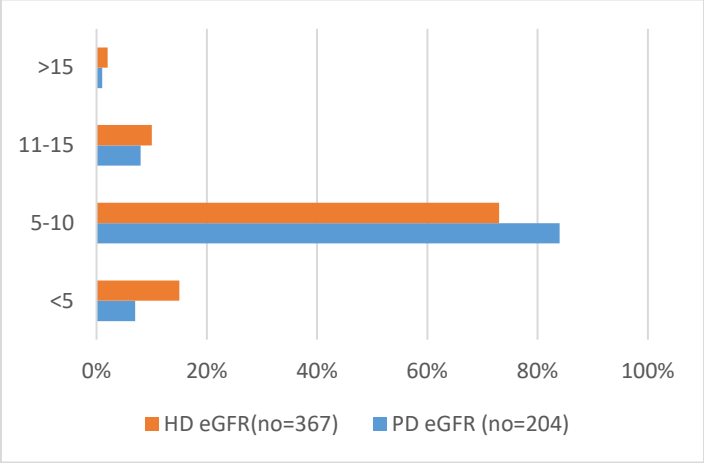
Compared with national data, we commence more patients in the 65-84 age group on haemodialysis but less in the 85+ age group.




*New Patients St George 2024 compared to ANZDATA 2023*

**Glomerular filtration rate (GFR)**

An eGFR is obtained from the serum biochemistry results taken immediately prior to commencing dialysis. The data are consistent with general recommendations following the IDEAL study, with many of our patients commencing at an eGFR below 10ml/min.




*PD and Haemodialysis eGFR at commencement 2013-2024 (% in each range)*

**Baseline characteristics of new patients- Body mass index**

| St George Hospital new patients | #Body Mass Index (kg/m) | PD 2013 – 2024 (%) | HD 2013 – 2024 (%) |
|---|---|---|---|
| | | N=204 | N=367 |
| | <18.5 | 1% | 2% |
| | 18.5-24.9 | 34% | 24% |
| | 25-29.9 | 30% | 27% |
| | 30-34.9 | 25% | 27% |
| | ≥35 | 10% | 20% |

*BMI for St George Hospital new patients starting 2013-2024*

*According to ANZDATA, BMI <18.5 indicates underweight, 18.5-24.9 normal, 25-29.9 overweight, 30-34.9 is obese and ≥35 morbidly obese. *Excludes patients who had haemodialysis prior to peritoneal dialysis.*

| | | St George HD 2013-2024 (n=367*) | ANZDATA HD 2023 (n=15401) | St George PD 2013-2024 (n=204*) | ANZDATA PD 2023 (n=3420) |
|---|---|---|---|---|---|
| **Average Age** | (displayed as age in years) | 64 | 62 | 63 | 58 |
| **Gender** | Male | 63% | 60% | 70% | 61% |
| | Female | 37% | 40% | 30% | 39% |
| **Late Referral (ANZDATA incidence HD=28388 (2013-2024) PD=11448 (2013-2024)** | (< 3 months before first treatment) | 16% | 20% | 9% | 8% |
| **Co -morbidities** | Smoking (Current and former) | 43% | 47% | 46% | 46% |
| | Chronic Lung Disease (yes and suspected) | 11% | 19% | 17% | 13% |
| | Cerebrovascular Disease | 6% | 14% | 11% | 10% |
| | Coronary Artery Disease | 34% | 43% | 42% | 31% |
| | Peripheral Vascular Disease | 10% | 24% | 15% | 18% |
| | Diabetes | 50% | 57% | 50% | 46% |

*Baseline characteristics compared with ANZDATA 2023- Excludes patients who had a previous mode of dialysis.*

**KPIs for Advanced Kidney Disease and Kidney Disease Education Clinic and acceptance onto dialysis**

The four benchmarks for pre-dialysis have been established on historical Renal Department data.

1. **Timely Referral to Kidney Disease Clinic Education (KDEC) – 100% of patients referred with eGFR ≤20 or KFRE ≥20% at 2years and 3mths prior to commencing RRT**

   In 2024, there were 77 patients referred for kidney disease clinic education, this was an increase from 74 in 2023. Two of the new patients referred were already on a form of RRT so are excluded from the below numbers. Ninety seven percent of patients were referred according to the department referral guidelines, an increase of 10% from 2023. The 3% of patients referred not meeting the referral criteria were scheduled for either partial or total nephrectomies.
   In 2024, 40 patients commenced kidney replacement therapy (KRT). Of these new patients, 98% received education if not prior to starting but within one month after commencing. This is an increase from 5% in 2023.

2. **70% of patients start planned modality within 18mths of commencing RRT.**

   For patients commencing dialysis in 2024, 98% started their planned dialysis choice compared with 95% in 2023. The one patient who started Hdx prior to live donor transplant was required to have bilateral nephrectomy due to the size of her polycystic kidneys.

3. **60% of patients starting KRT have vaccinated immunity.**

   This benchmark means that 60% of patients starting KRT had 'vaccinated immunity' defined as 'anti-HBs ≥10 International units/L'. Those with natural immunity and chronic infection were excluded in this analysis. 44% of patients who commenced dialysis in 2024 had vaccinated immunity. This is a 5% increase from the 39% in 2023.
   In 2024 every patient seen in the Kidney Disease Education clinic were verbally screened for HepB vaccination. The nephrologists were notified by the CKD Clinical Nurse Consultant of the patient screening via the kidney disease education clinic letter. Where a serology result was not current or available, were provided with a pathology form referred to a lab. If their Hep B levels were <10 IU a letter was faxed to the GP requesting initiation of Hep B immunization.
   Due to weaknesses in data accuracy in the Australian immunisation register it is difficult to know prior vaccination history to ascertain if a patient is a non-responder. This KPI should improve with time with better documentation and access to the Australian Immunisation register that the chronic kidney disease clinical nurse consultant has now obtained.

4. **100% of patients commencing dialysis with a signed consent**

   In 2024, 62% of patients consented prior to commencing dialysis. Ninety five percent had a signed consent within 4mths of commencing RRT. Three patients were late referrals and commenced RRT prior to receiving education they have not been included in these numbers.

   Patients attending the Kidney Disease Education Clinic (KDEC) in 2024 received a consent for dialysis form and information handout about dialysis and non-dialysis treatments. At their next nephrologist appointment, patients were encouraged to present this documentation for further discussion.
   There were eleven patients with eGFR <10% and a known RRT pathway at the end of 2024, of those 11 patients, 18% had a signed consent.

**Summary and Recommendations**

The Kidney Disease Education Clinic (KDEC) continues to function extremely well, capturing most patients prior to needing to commence renal replacement therapy, providing education and allowing the department to plan its resources accordingly.

All patients continue to be seen prior to commencing RRT or within one month of commencing (where appropriate).

In 2025 we will be focusing on:

- Ensuring patients have a signed consent prior to commencing dialysis
- Encouraging home therapy first attitude where possible to increase our home therapy numbers.
- Hep B screening and vaccination in our pre dialysis cohort.

# 7. CKD VIRTUAL MEDICAL CLINIC (VMC)

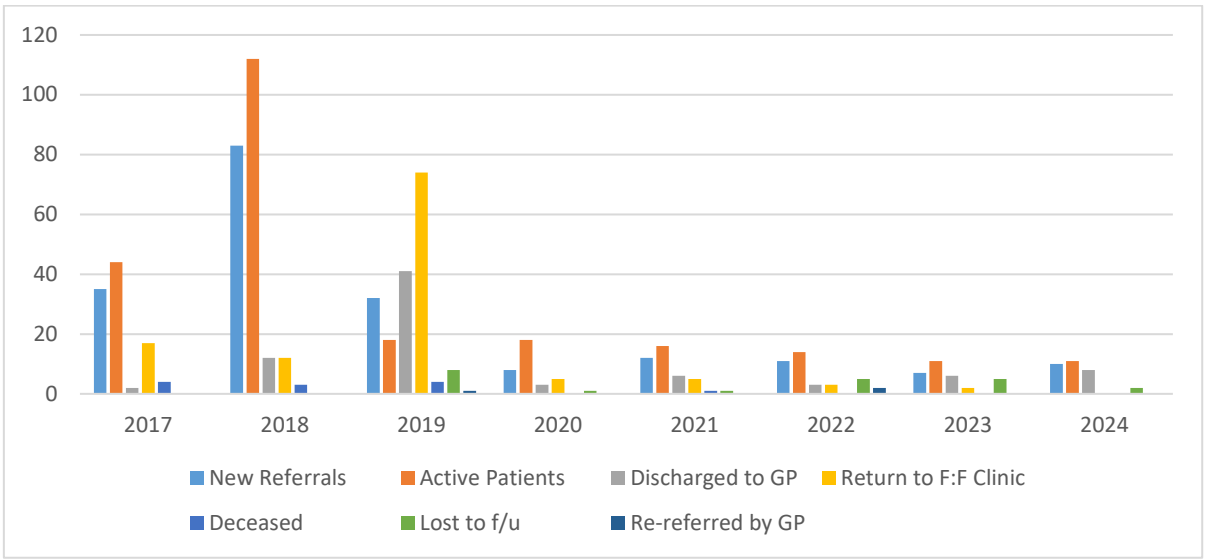
**Kylie Turner, A/Prof Ivor Katz**

The St George Hospital Renal Department initiated a virtual medical consulting (VMC) service in 2013, and due to its positive outcomes continues to remain an active component of our service. Aspects which made VMC attractive included:

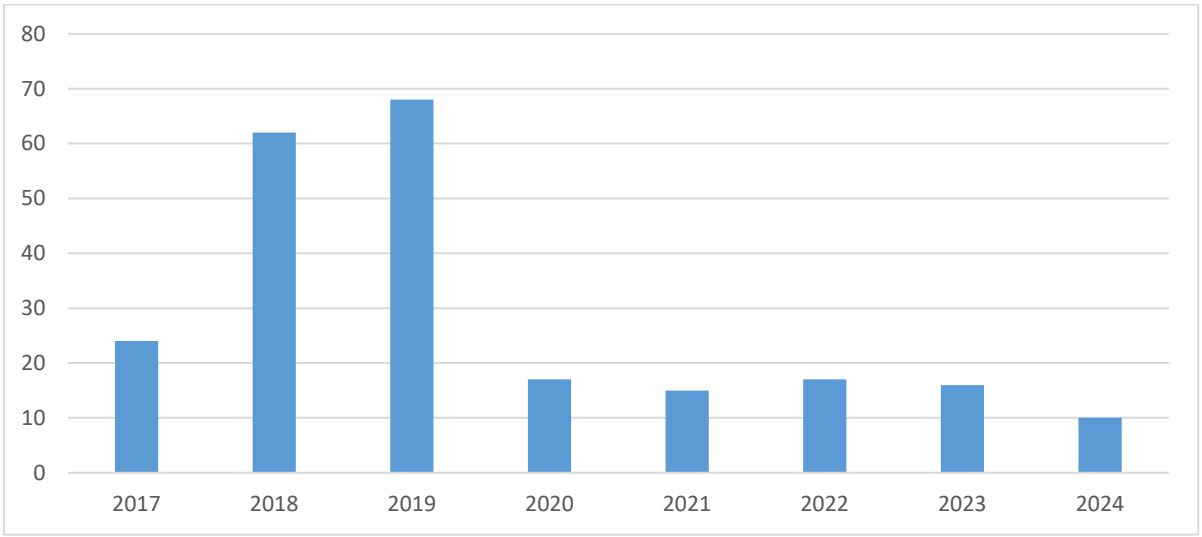
- High level of satisfaction within the GP community
- Saved the patient time travelling to the hospital, cost and difficulty of finding parking
- Patients were happy with 'virtual' model of care
- It improved the speed to a specialist review.

As the outcomes were positive, and at very least no different to 'standard' face to face clinic care, it was adopted as a model of care in our department.

Patients were referred to this form of consultation were those deemed by their nephrologist to be stable CKD patients whose blood pressure was controlled and simply require more 'active' tracking.




*Virtual Medical Clinic 2017-2024*




*Follow-up appointments 2017-2024*

| | Active patients 2019 (no=16) | Active patients 2020 (no=17) | Active patients 2021 (no=16) | Active patients 2022 (n=14) | Active patients 2023 (n=11) | Active patients 2024 (n=11) |
|---|---|---|---|---|---|---|
| Age (Average) | 74yrs | 77yrs | 72yrs | 74yrs | 72yrs | 75yrs |
| Female | 31% | 50% | 56% | 50% | 45% | 36% |
| Male | 69% | 50% | 44% | 50% | 55% | 64% |
| eGFR (average) | 45mL/min/1.73m² | 45mL/min/1.73m² | 52mL/min/1.73m² | 48mL/min/1.73m² | 56mL/min/1.73m² | 54mL/min/1.73m² |
| ACR (average) | 8.4mg/mmol | 14.7mg/mmol | 16.04mg/mmol | 14.56 mg/mmol | 21.27 mg/mmol | 19.34 mg/mmol |
| KFRE (Average) | 0.41% 2yr<br>1.54% 5yr | 0.38% 2yr<br>1.46% 5yr | 0.24% 2yr<br>0.98% 5yr | 0.20% 2yr<br>0.77% 5yr | 0.21% 2yr<br>0.80% 5yr | 0.49% 2yr<br>1.93% 5yr |

*Active VMC patients as of 31st Dec 2024*

## KPIs for Virtual Medical Clinic (VMC)

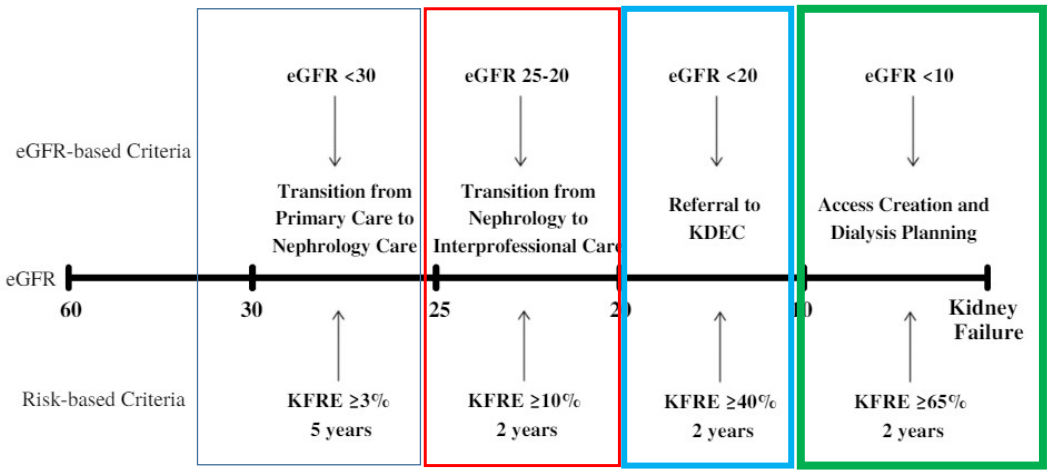
Two benchmarks for the virtual medical clinic have been established

1. **Patients' referral in line with clinic criteria 5yr risk <3%**

   In 2024 out of the 10 patients who were referred to the VMC 100% met the clinic criteria of a KFRE 5yr risk of less than 3% this is the same as 2023. Out of those 10 patients 100% were referred with an ACR result.

2. **Patients meeting criteria for decision making as per guidelines outlined in the Kidney Failure Risk Equation Score**

   a. Renal Department data evaluating KFRE versus eGFR for clinical decision-making timeline. (Reference; Li et al. Renal Department data evaluating KFRE versus eGFR for clinical decision-making timeline. Journal Internal Medicine; In Press.. 2024




## Summary and Recommendations

- Yearly review of tracking spreadsheet to ensure active patients currently meet the criteria to remain active in the virtual medical clinic.
- Increase the uptake of patients being referred to the program by promoting this service further in the SGH renal department.
- Currently we are reviewing the impact of the KFRE score in assisting us with predicting decline in renal function and when transition points in service are needed e.g. pre-dialysis care and vascular access.

# 8. RENAL VASCULAR ACCESS

**Yanella Martinez-Smith, Jayson Catiwa**

## BACKGROUND AND PERFORMANCE INDICATORS

Native arteriovenous (AV) fistula remains the preferred vascular access for haemodialysis due to prolonged patency, minimum risk of infection, and maintenance.

The Renal Vascular Access Clinical Nurse Consultants aim to monitor all fistulae from creation until the commencement of dialysis to ensure maturity, perform access surveillance before and after dialysis has commenced, and ensure a low level of access-related complications are maintained.

## DATA BENCHMARK

Data is benchmarked against ANZDATA 47$^{th}$ Annual Report 2024, KDOQI 2006, KDOQI 2019, and KHA-CARI 2013 guidelines.

The key performance measures for renal vascular access are:

- > 50% of patients commencing first haemodialysis have functioning arteriovenous access.[1]
- > 80% of prevalent patients dialysing through a native fistula.[2]
- < 1.5 episodes/1000 catheter days of tunnelled or non-tunnelled catheter infection rate. [3]

## EXECUTIVE SUMMARY

Almost all vascular access performance measures are within the national and international benchmark; primary AVF & AVG rates within SGH Renal Department are above the national average. Haemodialysis access-related infectious complications remain below the benchmark, and access survival remains excellent.

# 1 INCIDENT VASCULAR ACCESS

## 1.1 Incident Haemodialysis Patients in 2024

**Table 1**. Incident Haemodialysis Patients in 2024

| | |
|---|---|
| Incident HD patients, *N* =24 | |
| AV access created before initial HD (n, %) | 12, 50 |
| Mature at first HD | 12,100 |
| Additional interventions before use | 5, 21 |
| Late referral | 5, 20 |

Comments

- There were 24 incident haemodialysis (HD) patients in 2024 at St George Hospital (SGH) Renal Department. Of those 24, 12 (50%) patients commenced HD with a central venous catheter (CVC).
- All arteriovenous (AV) access created in 2024 reached maturity at first HD.
- Late referrals at SGH Renal Department have increased to 20% (n = 5) in 2024 from 14% in 2023. This is comparable to the late referrals nationwide (15%) in 2024, according to the ANZDATA Registry [2]. Excluding late referrals, 12/19 (63%) patients commenced first HD with an arteriovenous access.

## 1.2 Incident Vascular Access

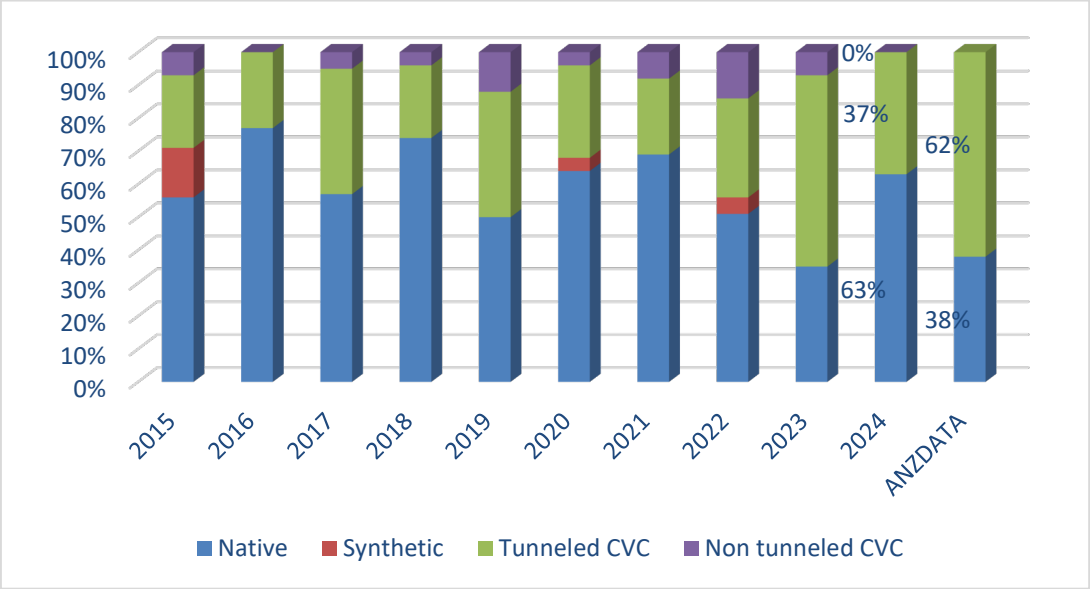



**Figure 1**. Incident Vascular Access

Comment

- The frequency of incident AV fistula at entry of patients into HD at SGH Renal Department was above the national benchmark of 38% in 2024, while the frequency of CVC (both tunnelled and non-tunnelled) as initial access (37%) was lower than the benchmark of 62% across Australia.

## 2 PREVALENT HAEMODIALYSIS PATIENTS

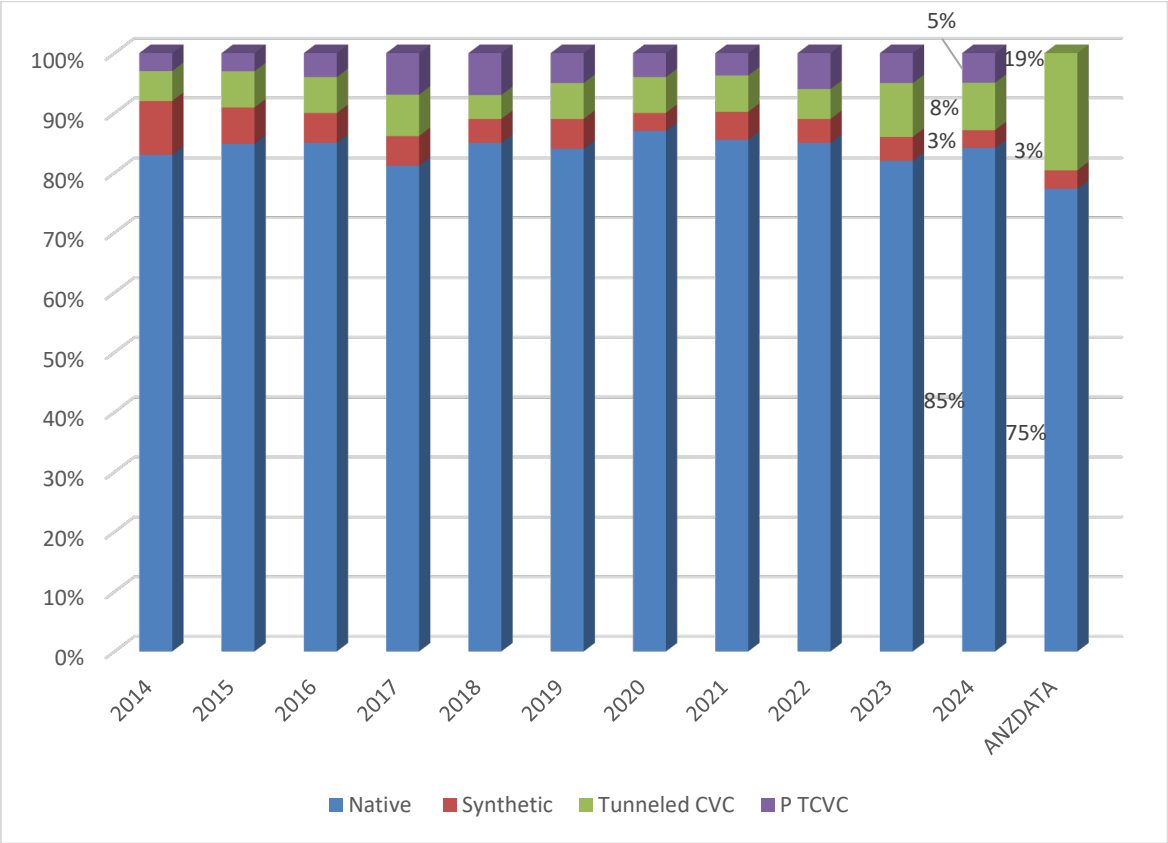



**Figure 2**. Prevalent Vascular Access in SGH Renal Department

Comments

- There were 208 prevalent patients on haemodialysis at SGH Department as of 31st December 2024.
- 88% of patients on maintenance haemodialysis were using AV fistula or graft, which exceeds the 2024 ANZDATA benchmark of 79%.
- 13% of patients at SGH Renal Department were using a tunnelled catheter for maintenance haemodialysis, which is lower than the national benchmark of 19%. 5% of patients are using catheters as the permanent HD access due to limited arteriovenous access option.

# 3 AV ACCESS COMPLICATIONS AND SURVIVAL

## 3.1 Infectious Complications

- There was 1 episode of bloodstream infection (BSI) from AV fistula and 1 episode from AV graft in SGH Renal Department. Both BSI events were caused by *Staphylococcus aureus*. This data does not include home haemodialysis patients.

**Table 2. Arteriovenous Access Bloodstream Infection**

| Year | Fistula | | Graft | |
|---|---|---|---|---|
| | Episode | Rate *BSI/100 patient-months* | Episode | Rate *BSI/100 patient-months* |
| **2024** | 1 | NA | 1 | NA |
| **2023** | 0 | 0 | 0 | 0 |
| **2022** | 0 | 0 | 0 | 0 |
| **2021** | 0 | 0 | 0 | 0 |
| **2020** | 1 | 0.7 | 0 | 0 |
| **2019** | 2 | 0.69 | 0 | 0 |
| **2018** | 0 | 0 | 0 | 0 |
| **2017** | 3 | 0.27 | 0 | 0 |
| **2016** | 1 | 0.08 | 0 | 0 |
| **2015** | 2 | 0.15 | 0 | 0 |

3.2 Thrombotic Complications

- The average thrombosis events across both arteriovenous access types is 0.83 episodes per month. Reasons for access thrombosis include loss to follow up in vascular clinic, delayed theatre time, postoperative complications, and low access flow readings identified at the bedside.
- Early detection of the dysfunctional access through physical assessment and surveillance through transonic measurement and bedside ultrasound has resulted in prompt escalation. More than 50% of thrombosed cases were escalated to the vascular surgeons.

**Table 3**. Arteriovenous Access Thrombosis Events

| Year | Native | | Grafts | | Monthly average |
|---|---|---|---|---|---|
| | Episode | *N* patients | Episode | *N* patients | |
| 2024 | 8 | 6 | 2 | 1 | 0.83 |
| 2023 | 9 | 7 | 2 | 2 | 0.92 |
| 2022 | 8 | 8 | 3 | 3 | 0.92 |
| 2021 | 11 | 11 | 2 | 1 | 1.1 |
| 2020 | 9 | 9 | 3 | 3 | 1.0 |
| 2019 | 10 | 10 | 5 | 3 | 1.25 |
| 2018 | 7 | 7 | 2 | 1 | 0.75 |
| 2017 | 9 | 9 | 6 | 5 | 1.25 |
| 2016 | 15 | 14 | 3 | 3 | 1.5 |
| 2015 | 20 | 17 | 16 | 5 | 2.5 |
| 2014 | 14 | 13 | 13 | 8 | 2.3 |
| 2013 | 8 | 8 | 12 | 7 | 1.7 |

3.3 Access Survival

- KDOQI (2006) recommends AVF patency > 3.0 years and AVG patency > 2.0 years.
- Cumulative assisted patency is defined as the number of accesses that remain patent regardless of the number of interventions during a specific period.
- Data includes current and deceased patients since 2004 and excludes primary failure. The endpoint was access lost. Data were censored for deaths, current functioning access, transplantation, or transfer to another unit.
- Cumulative proportion of arteriovenous access surviving at the end of the following period: AVF at 5 years = 81%, at 10 years = 70%; AVG at 1 year = 61%, 2 years = 53%, 3 years = 46%; Flixene grafts at 1 year = 80%, 3 years = 56%.
- Access survival continues to be relatively similar to the previous year's results.

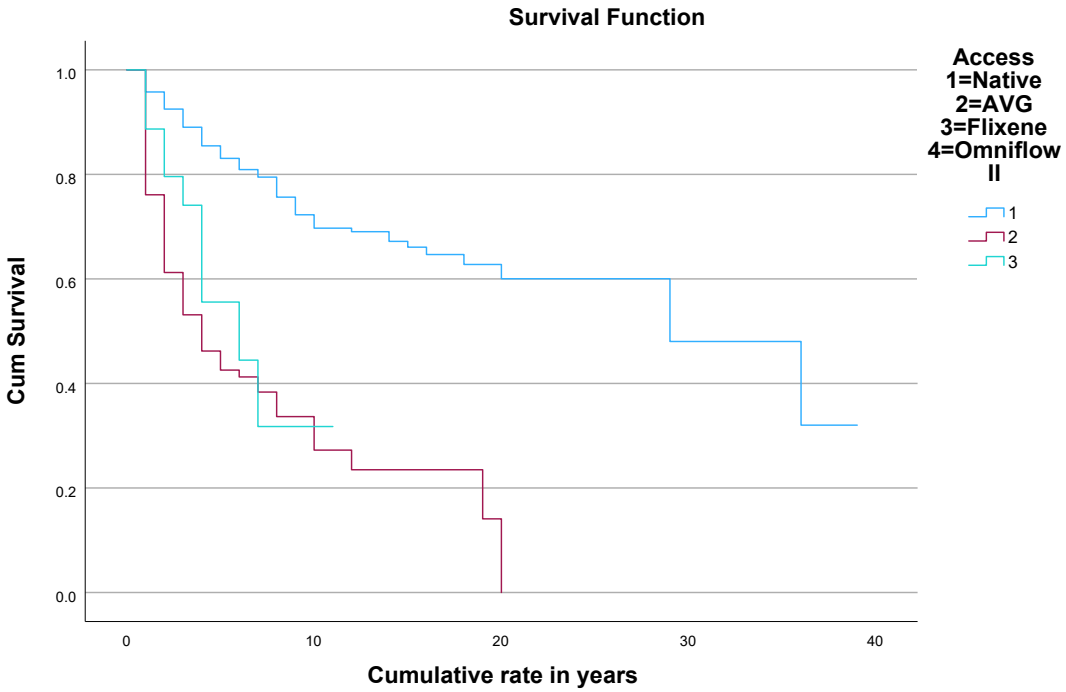



**Figure 3**. Survival of the Arteriovenous Access

## 4 CENTRAL VENOUS CATHETERS (CVC)

4.1 CVC Activity Level

- Tunnelled cuffed catheters provide temporary or permanent access for acute and chronic haemodialysis patients, including those patients awaiting AVF maturation or when AVF creation is not feasible.[3] They are usually placed by Interventional Radiology.

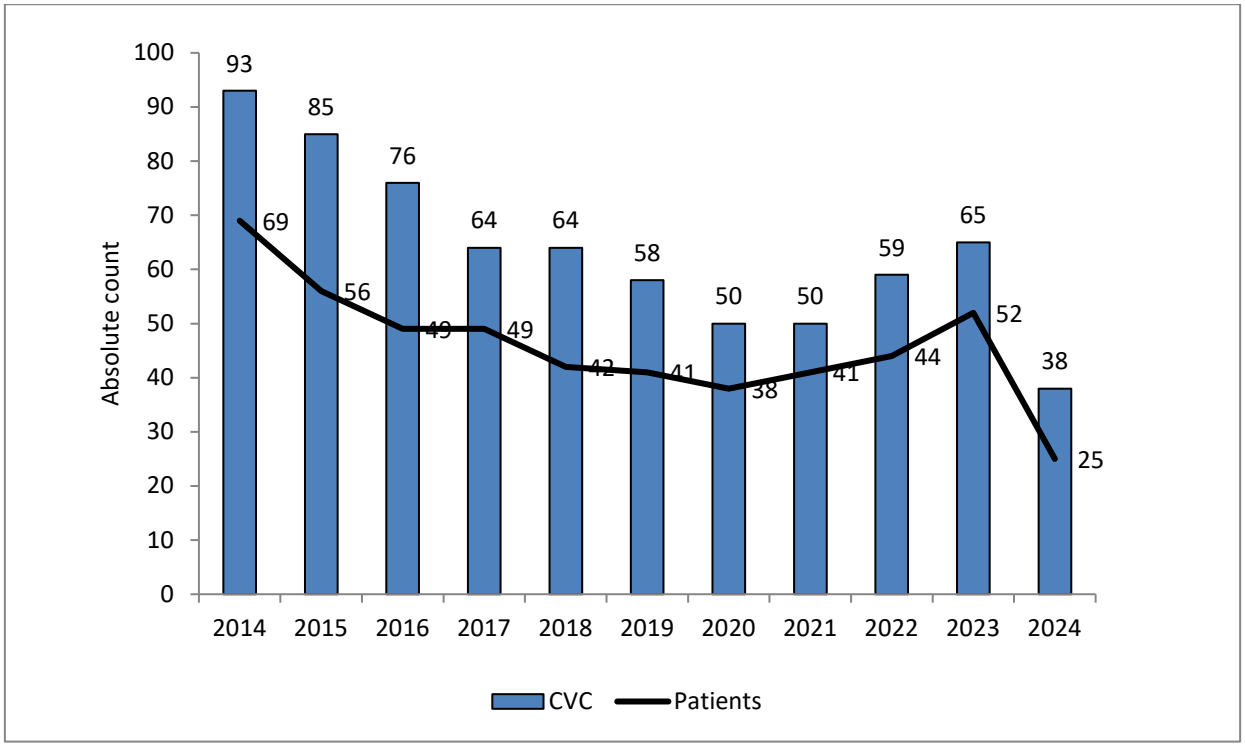



**Figure 4.** Number of Haemodialysis Catheters Inserted in 2024

Comments

- The number of CVCs inserted for AKI & ESKD is lower than the previous year.
- The total number of catheter exposure has decreased from 5,732 catheter days in 2023 to 3,164 catheter days in 2024. Haemodialysis catheter remains in situ within a mean dwell time of 98 days in 2024, which is slightly higher in 2023 (88 days).

4.2 Catheter Insertion

- The ICU Department continues to manage patients with AKI using a catheter as the dialysis access despite fewer catheters inserted for this purpose. Non-tunnelled vascath insertions for non-ICU patients requiring HD are being performed by Radiology Department, or the Vascular Access Team.

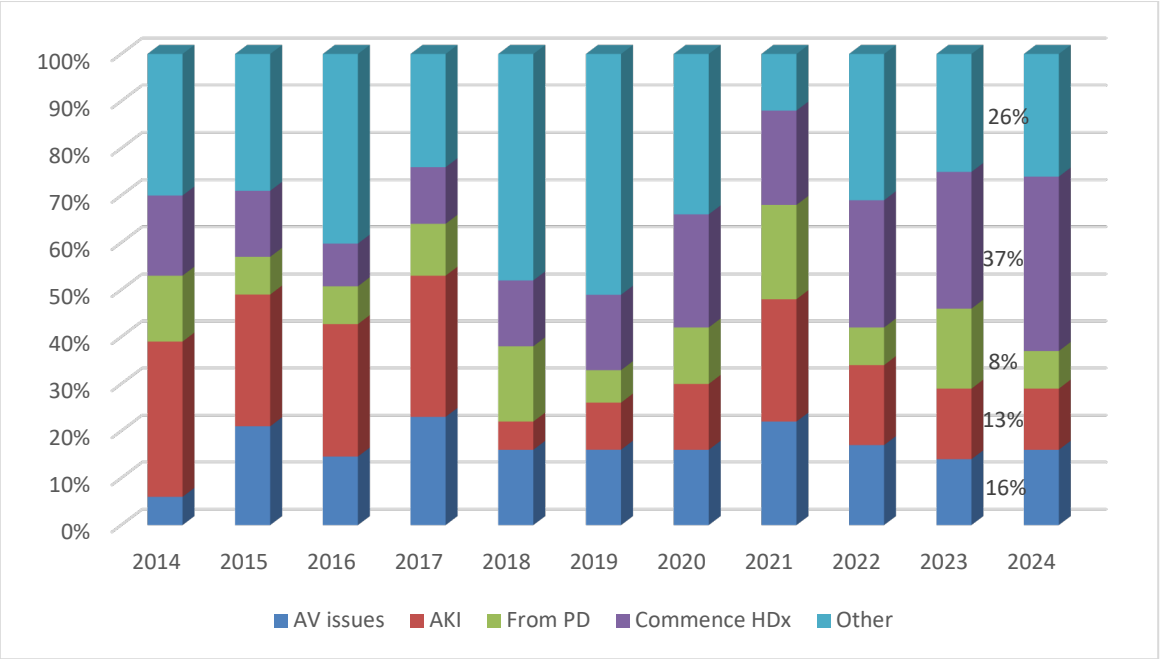



**Figure 5**. Reasons for Catheter Insertion. Fistula group includes immature, revision or thrombosed access. ***Other*** includes replacing a non-tunnelled with a tunnelled catheter, incorrect placement, malfunction, thrombotic and infectious complications.

4.3 Catheter-related Infectious Events

- KDOQI 2006 recommends <1.5 episodes/1000 catheter days of tunnelled or non-tunnelled catheter infection rate.[3]
- Evidence shows that the exit site catheter infection rate varies from 0.35 to 8.3/1000 catheter days for tunnelled catheters and from 8.2 to 16.75/1000 catheter days for non-tunnelled catheters.[4]
- The incidence of haemodialysis catheter-related bacteraemia is highly variable (from 1.6 to 6.18/1000 catheter-days for tunnelled catheters and from 1.4 to 8.3/1000 catheter-days for non-tunnelled catheters.[4]

**Table 4. Catheter-related Infection Summary**

| Year | Exit site infection | | Catheter-related bacteraemia | |
|---|---|---|---|---|
| | Freq % | Rate *episodes/1000 catheter days* | Freq % | Rate *episodes/1000 catheter days* |
| **2024** | 5 | 1.58 | 3 | 0.63 |
| **2023** | 3 | 0.35 | 5 | 0.52 |
| **2022** | 9 | 0.64 | 7 | 0.25 |
| **2021** | 2 | 0.1 | 2 | 0.10 |
| **2020** | 2 | 0.07 | 2 | 0.07 |
| **2019** | 5 | 0.43 | 2 | 0.14 |
| **2018** | 9 | 0.67 | 10 | 0.78 |
| **2017** | 7 | 0.44 | 7 | 0.35 |
| **2016** | 4 | 0.27 | 6 | 0.45 |
| **2015** | 5 | 0.41 | 1 | 0.10 |
| **2014** | 5 | 0.54 | 2 | 0.22 |

Comments

- Among the 38 catheters inserted in 2024, 5 (13%) episodes of exit site infection, and 3 (8%) episodes of catheter-related bloodstream infectious events were reported.
- Exit site infections were primarily caused by *Pseudomonas aeruginosa* and *Staphylococcus aureus*, while catheter-related bacteraemia was mainly due to Methicillin-sensitive *Staphylococcus aureus* and *Staphylococcus hominis*.
- The gentamicin/heparin lock continues to be utilised in SGH Renal Department as a recommended means to reduce catheter-related infectious events.
- SGH Renal Department utilises a Decontamination Protocol as a preventative measure to salvage haemodialysis catheters. The KHA-CARI guideline suggests that antibiotic locks be considered to salvage catheters.[5]
- The potential for the emergence of antimicrobial resistance remains a significant concern;[6] however, random gentamicin levels of <0.5 mg/L indicate toxicity is unlikely. Bi-annual audits of the gentamicin level are being held in the department.

## 5 FUTURE PLANS

- The nurse-led vascular access clinic will continue twice weekly.
- The combined Nephrologist/Vascular Surgeon meeting will be held quarterly.
- Renal Education for Nursing Advancement and Leadership (RENAL) Professional Development Program, which commenced in 2025, will continue to upskill and train senior nurses in preparation for a clinical nurse consultant role.
- The VA professional development group will meet monthly in SGH Renal Department to keep staff involved in the collective decision-making in improving vascular access care of patients. Regular in-service education sessions will be provided to the staff.
- Vascular access workshops incorporating point-of-care ultrasound for arteriovenous access cannulation will be conducted bi-annually.
- Vascular access surveillance through the nurse-led clinic, Transonic (bedside), and ultrasound machines in the dialysis unit will remain to aid in the timely detection of the dysfunctional signs in AV access.
- Vascular access reporting will be integrated into the electronic platform.
- Vascular access bloodstream infections will be recorded in the ANZDATA platform.

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# 9. HAEMODIALYSIS

**A/Prof Ivor Katz, Evelyn Graf, Tracey Blow, Elizabeth Hogan, Louise Jordan, Dr. Brendan Smyth, Xiaobing Ma**

Haemodialysis continues to be provided at 3 centres supported by the St George Hospital in the South Eastern Sydney Local Health District (SESLHD). An In-Centre dialysis unit at St George Hospital on the 4 West ward and two satellite dialysis units 1. On the Sutherland Hospital campus and 2. at the Fresenius Medical Care (FMC) unit in Kogarah town square.

## Activity

The **St George Hospital 4 West In-centre** unit operates a 17-chair haemodialysis service including two isolation rooms. The unit has a total of 23 dialysis machines. There are 4 portable reverse osmosis (RO) machines to provide acute haemodialysis in outlier areas as required. The unit provides high level care haemodialysis for inpatients and frail outpatients. In 2024, average 54 patients were dialysed every month and a total of 8424 treatments were completed.

The **St George Satellite Dialysis Clinic (FMC)** outsourced to Fresenius Medical Care (FMC) operates 17 chairs, with capacity to expand to 25 if required. On average in 2024, 71 patients were dialysed each month and a total of 11,111 treatments were completed.

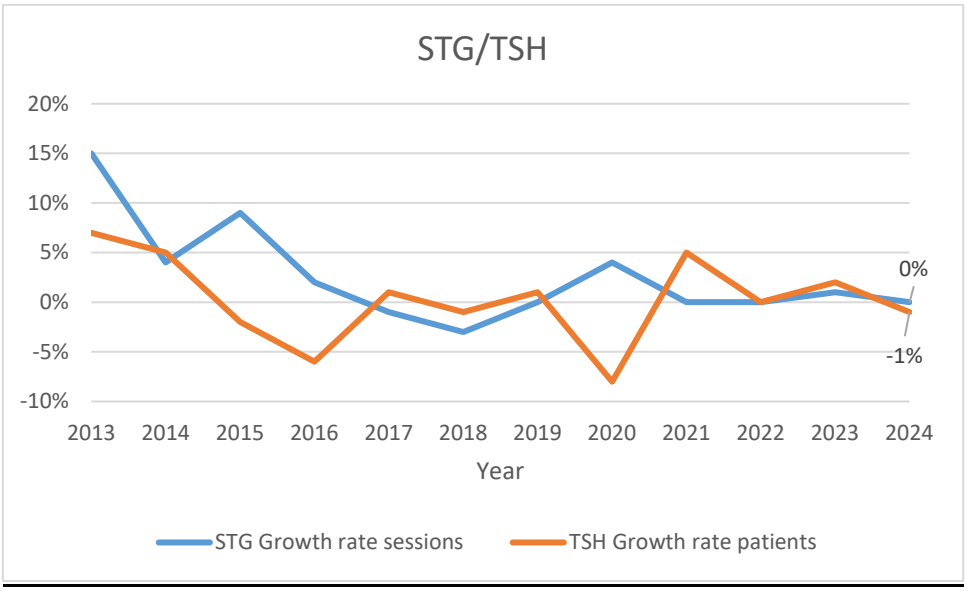
**Home haemodialysis training** is undertaken at the FMC. One patient was successfully trained in 2024. The total number of home haemodialysis patients is lower than in the past, at 22 patients (peak 53 in 2009). Eleven patients were admitted to hospital throughout the year and (6 patients were being dialysed on the newly developed home supported dialysis program, managed by Dialysis Australia a private supplier of home dialysis. Respite sessions were provided for 5 patients. Reasons for respite included assistance with cannulation (2 patients), family away or no home dialysis nurse to provide assisted dialysis (3 patients). The number of respite sessions ranged from two to eighteen days.

The FMC Satellite clinic also operates a nocturnal dialysis shift and throughout 2024 eight patients (10%) were dialysing on the overnight (nocturnal) dialysis program, with capacity for 12 patients.

**The Sutherland Shire Satellite unit** operates twelve chairs for medically stable patients. In 2024, 6267 treatments were performed, and on average, 45 patients dialysed each month.

COVID-19 continued to affect all 3 services in 2024 but with less cases overall compared to past few years. Nine (9) patients tested positive for COVID-19 at FMC with two (2) patients sent to incentre during the isolation period and 1 death following COVID-19 infection. For the year 2024, 4 West dialysis unit dialysed approximately 22 COVID positive patients.

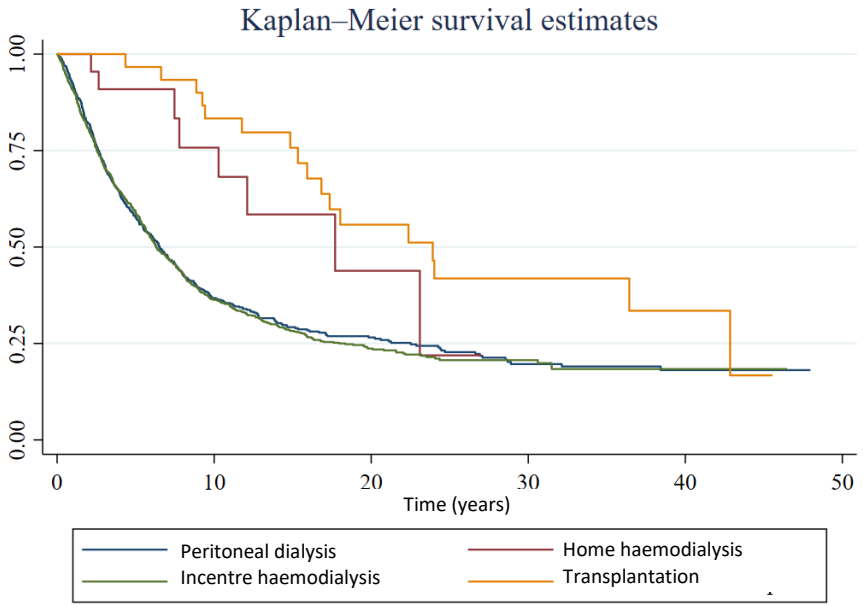
## Activity by Dialysis Centre



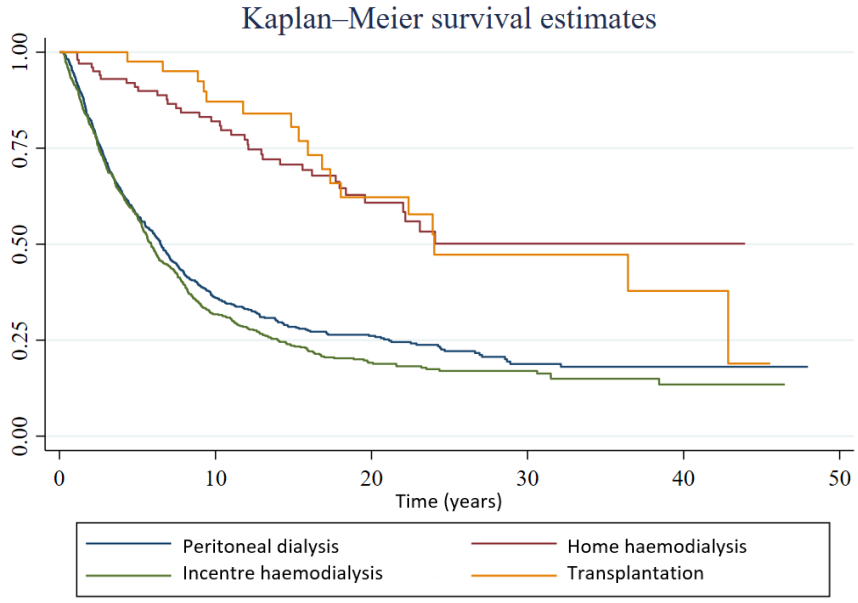

*Growth Rates in Haemodialysis at St George (In-Centre and Satellite) and Sutherland Dialysis Units.*

## Survival analyses of all St George Haemodialysis Patients

As expected, survival is greater among patients initiating KRT with home haemodialysis or kidney transplant. There is no appreciable difference in survival between patients initiating haemodialysis or peritoneal dialysis. These observations remain true when classifying patients by modality at 90 days after KRT start.




***Overall survival by initial KRT modality***



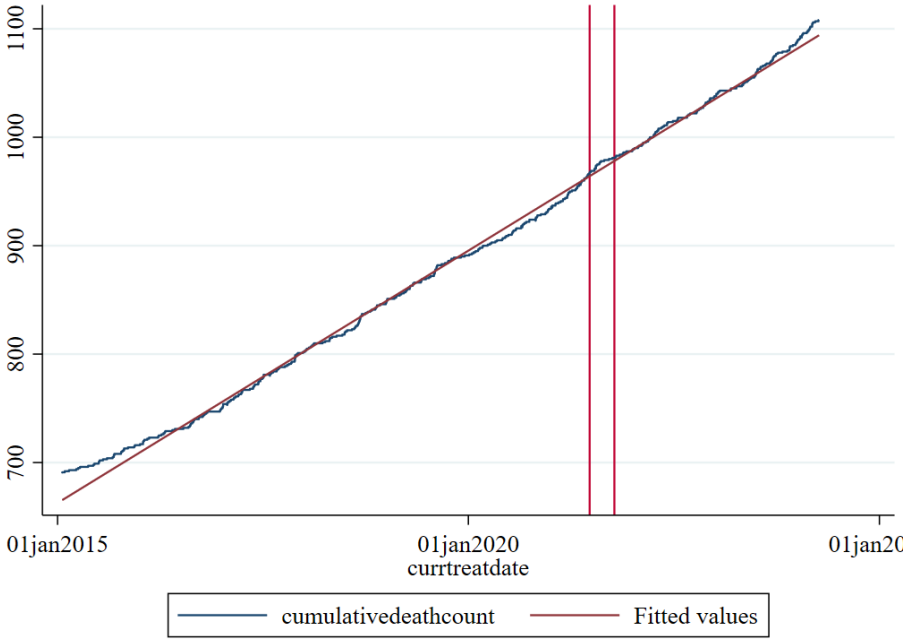

***Overall survival by KRT modality at 90 days***

**Mortality rate by vintage**

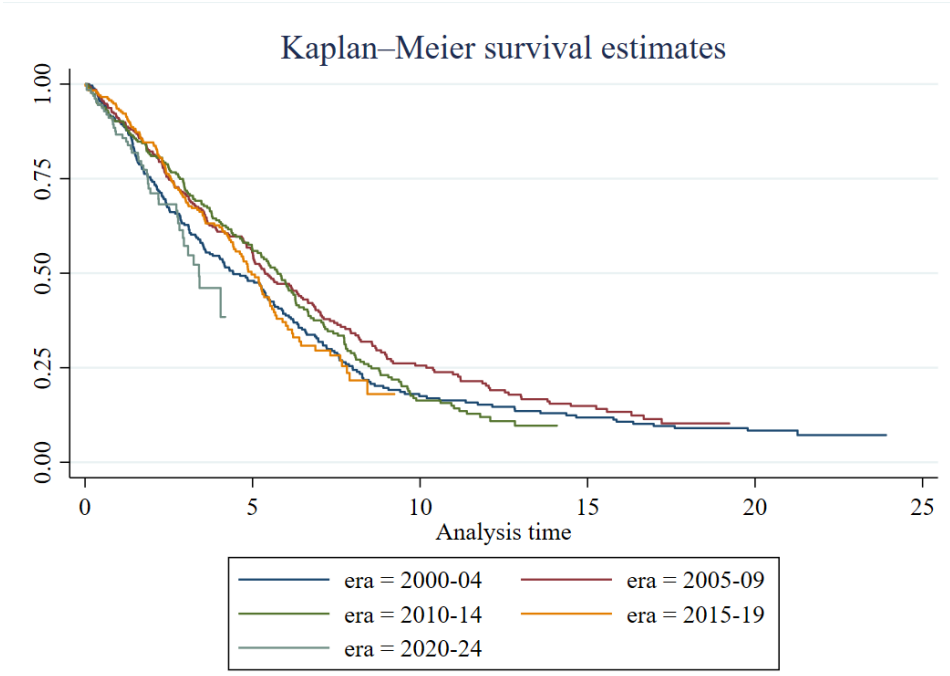
The mortality rate among all patients receiving KRT is gradually increasing, which may be in line with increasing age and comorbidity of patients at commencement of KRT.

| Vintage | Number of patients | Mean age (years) | Mortality (per 100 patient years) | Median survival (years) |
|---|---|---|---|---|
| Pre-2000 | 455 | 50.8 | 5.5 | 8.1 |
| 2000-04 | 267 | 59.4 | 8.4 | 5.9 |
| 2005-09 | 276 | 61.2 | 8.5 | 7 |
| 2010-14 | 269 | 60.2 | 9.6 | 7.2 |
| 2015-19 | 239 | 62.3 | 11.8 | 5.6 |
| 2020-24 | 132 | 62.9 | 15.6 | 4 |
| Total | 1638 | 57.3 | 7.7 | 6.7 |

COVID-19 had, at most, a modest effect on mortality as demonstrated by the figure below where the number of deaths per unit time remains stable over the past 15 years.




***Cumulative deaths between 1 Jan 2015 and 1 Jan 2025. Red lines marks start and end of delta-wave lockdown in Sydney.***




***Survival in patients commencing dialysis (censored for transplant) since 2000***

**Age alone does not fully explain the rise in risk of mortality among dialysis patients, as demonstrated by the age-adjusted risk of mortality.**

| Vintage | HR (95% CI)<br>*Reference = 2005-09* | P-value |
|---|---|---|
| 2000-04 | 1.36 (1.11-1.65) | 0.002 |
| 2010-14 | 1.07 (0.87-1.31) | 0.51 |
| 2015-19 | 1.20 (0.95-1.50) | 0.12 |
| 2020-14 | 1.79 (1.27-2.53) | 0.001 |

*Cox-model of mortality by KRT vintage (2005-09 as reference), adjusted for age at KRT start and stratified by KRT modality.*

***Movement in and out of Ward 4 West In-Centre haemodialysis unit from 2018 to 2024.***

| **4W Incentre haemodialysis 2024** | **2018** | **2019 4W** | **2019 FMC** | **2020 4W** | **2021 4W** | **2022 4W** | **2023 4W** | **2024 4W** |
|---|---|---|---|---|---|---|---|---|
| **In-centre haemodialysis patients at beginning of year** | 133 | 130* | | | | | | |
| Remained in 4W / Transferred to FMC (January 2019) | | 61 | 69 | *61 | 66 | 52 | 56 | 54 |
| IN | | | | | | | | |
| 1. New Patients | 20 | 19 | 7 | 15 | 15 | 17 | 19 | 13 |
| 2. Transfers from other units | 18 | 8 | 5 | 20 | 0 | 12 | 10 | 11 |
| 3. Transfers from PD | 6 | 7 | 4 | 3 | 0 | 3 | 6 | 3 |
| 4. Failed transplants | 3 | 3 | 1 | 0 | 0 | 0 | 2 | 0 |
| 5. Transfers from Home Hdx/Satellite/incentre | 4 | 5 | 14 | 6 | 14 | 7 | 14 | 14 |
| 6. Acute Kidney Injury* | 11 | 2 | 1 | 0 | 0 | 0 | 3 | 1 |
| 7. Other | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Subtotal*** | ***63*** | ***45*** | ***28*** | ***44*** | ***29*** | ***39*** | ***54*** | ***42*** |
| OUT | | | | | | | | |
| 7. Transplants | 2 | 0 | 5 | 0 | 0 | 1 | 0 | 1 |
| 8. Transfers to other units/overseas | 6 | 6 | 2 | 17 | 2 | 3 | 6 | 8 |
| 9. Transfers to Home Hdx | | 0 | 6 | 4 | 1 | 3 | 0 | 1 |
| 10. Transfers to PD | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 2 |
| 11. Transfers to Satellite/incentre | 7 | 6 | 8 | 0 | 8 | 10 | 16 | 6 |
| 12. Regain Function | 8 | 0 | 1 | 0 | 2 | 2 | 3 | 0 |
| 13. Deaths (medical) | 17 | 14 | 1 | 8 | 11 | 3 | 9 | 16 |
| 14. Deaths (withdrawal) | 15 | 7 | 1 | 10 | 17 | 13 | 15 | 4 |
| ***Subtotal*** | ***56*** | ***33*** | ***24*** | ***39*** | ***43*** | ***35*** | ***56*** | ***38*** |
| **NET GAIN/ LOSS** | -14 | +12 | +4 | +5 | -14 | +4 | -2 | +4 |
| **In-centre haemodialysis patients at end of year** | | 73 | 73 | 66 | 52 | 56 | 54 | 58 |
| | 119 | 146 | | | | | | |

***Movement in and out of the Sutherland Satellite haemodialysis unit from 2015 to 2024.***

| **Sutherland satellite HD unit summary report to 2024** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** | **2024** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Satellite haemodialysis patients at beginning of year** | **47** | **48** | **48** | **48** | **48** | **45** | **45** | **43** | **46** | **45** |
| IN | | | | | | | | | | |
| 1. New Patients | 2 | 0 | 0 | 0 | 0 | 4 | 2 | 2 | 0 | 2 |
| 2. Transfers from other units | 1 | 1 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 1 |
| 3. Transfer from PD | 0 | 0 | 1 | 4 | 1 | 0 | 1 | 1 | 2 | 0 |
| 4. Transfer from Incentre | 12 | 7 | 14 | 11 | 11 | 6 | 6 | 10 | 7 | 10 |
| 5. Transfer from home/training | | | | 6 | 1 | 1 | 1 | 0 | 1 | 3 |
| ***Subtotal*** | ***15*** | ***8*** | ***15*** | ***23*** | ***15*** | ***12*** | ***12*** | ***15*** | ***12*** | ***16*** |
| **OUT** | | | | | | | | | | |
| 5. Transplants | 2 | 1 | 0 | 4 | 3 | 1 | 1 | 2 | 2 | 3 |
| 6. Transfers to Home Hdx | 1 | 1 | 2 | 1 | 3 | 1 | 1 | 0 | 1 | 1 |
| 7. Transfers to PD | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8. Transfers to Incentre | 5 | 3 | 8 | 11 | 3 | 7 | 2 | 0 | 1 | 3 |
| 9. Transfer to other units | 1 | 1 | 1 | 0 | 2 | 1 | 3 | 2 | 2 | 3 |
| 10. Deaths (medical) | 5 | 1 | 3 | 5 | 2 | 1 | 2 | 6 | 5 | 4 |
| 11. Deaths (withdrawal) | 0 | 0 | 0 | 1 | 3 | 1 | 4 | 2 | 2 | 2 |
| 12. Regain Function | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| ***Subtotal*** | ***14*** | ***8*** | ***15*** | ***23*** | ***18*** | ***12*** | ***14*** | ***12*** | ***13*** | ***16*** |
| **NET GAIN/ LOSS** | **1** | **0** | **0** | **0** | **-3** | **0** | **-2** | **3** | **-1** | **0** |
| **Satellite haemodialysis patients at end of year** | **48** | **48** | **48** | **48** | **45** | **45** | **43** | **46** | **45** | **45** |

***Movement in and out of the Fresenius Medical Care haemodialysis unit from 2019 to 2024.***

| **Fresenius Medical Care satellite HD summary report to 2024** | | **2020** | **2021** | **2022** | **2023** | **2024** |
|---|---|---|---|---|---|---|
| No. patients at the start of the year | | 73 | 71 | 75 | 76 | 77 |
| IN | | | | | | |
| 1. New Patients | | 15 | 12 | 12 | 6 | 8 |
| 2. Transfers from other units | | 2 | 2 | 0 | 1 | 0 |
| 3. Transfers from PD or home | | 3 | 1 | 5 | 2 | 2 |
| 4. Failed transplants | | 0 | 0 | 0 | 0 | 0 |
| 5. Permanent transfers from In-centre or TSH Satellite | | 6 | 7 | 11 | 15 | 2 |
| 6. Acute Kidney Injury* | | 1 | 0 | 0 | 0 | 0 |
| 7. In-centre/TSH backfill | | 11 | 19 | | - | - |
| 8. Respite | | | 21 | 8 | 17 | 5 |
| 9. Holiday patients | | | 8 | 0 | 19 | 30 |
| *Subtotal* | | | 22 | 23 | 24 | 12 |
| OUT | | | | | | |
| 7. Transplants | | | 1 | 8 | 8 | 5 |
| 8. Transfers to other units/overseas | | | 0 | 3 | 2 | 0 |
| 9. Transfers to Home Hdx/MBP | | | 1 | 0 | 0 | 2 |
| 10. Transfers to PD | | | 0 | 2 | 0 | 1 |
| 11. Transfer to Incentre/Satellite | | | 14 | 6 | 10 | 0 |
| 12. Regain Function | | | 0 | 0 | 0 | 0 |
| 13. Deaths (medical) | | | **3** | **1** | **3** | **2** |
| 14. Deaths (withdrawal) | | 0 | 0 | 2 | 0 | 0 |
| 15. Others out - Return to Inc /TSH/home or parent hospital | | 24 | 40 | 22 | 23 | |
| ***Subtotal*** | | ***53*** | ***18*** | ***16*** | ***1*** | ***-10*** |
| **NET GAIN/ LOSS** | | **-2** | **5** | **1** | **0** | **2** |
| **Haemodialysis patients at end of year** | | **71** | **75** | **76** | **77** | **74** |

***Movement in and out of the Home training haemodialysis unit from 2019 to 2024.***

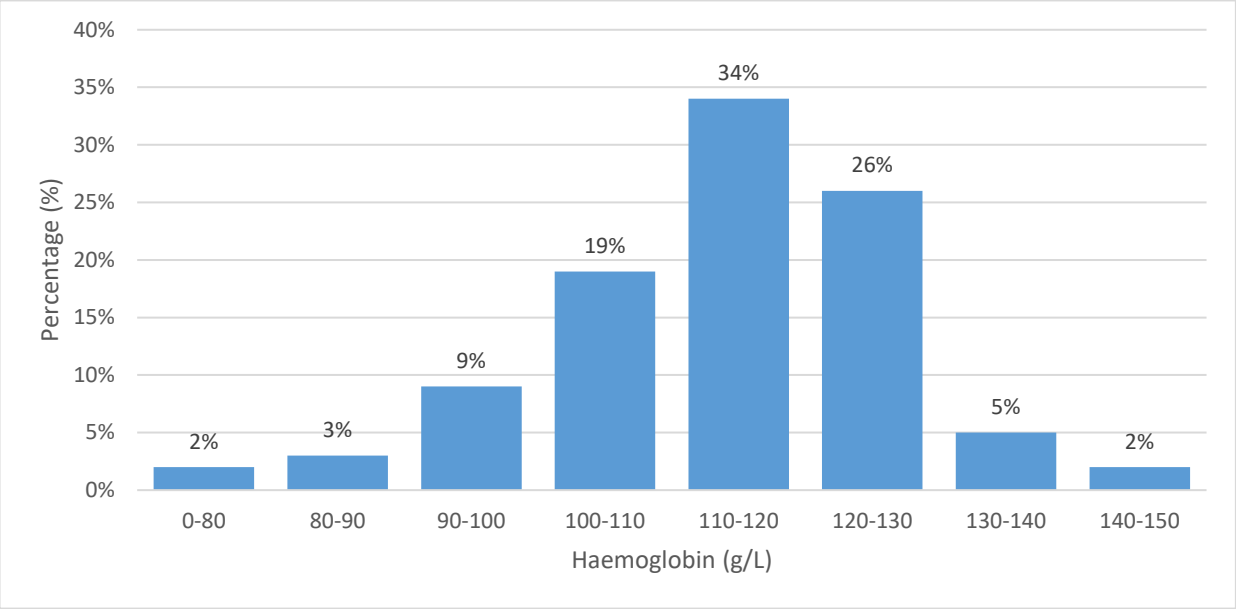
| **Home haemodialysis 2024 summary report** | | **2020** | **2021** | **2022** | **2023** | **2024** |
|---|---|---|---|---|---|---|
| **Home haemodialysis patients at beginning of year** | | **34** | **36** | **33** | **34** | **24** |
| **IN** | | | | | | |
| 1. New Patients | | 0 | 4 | 3 | 1 | 2 |
| 2. Transfer from PD | | 0 | 0 | 0 | 0 | 0 |
| 3. Transfers from other units | | 2 | 0 | 0 | 2 | 0 |
| 4. Transfer from Satellite | | 7 | 1 | 0 | 0 | 2 |
| 5. Failed transplants | | 0 | 0 | 0 | 0 | 0 |
| 6. Transfer from Incentre Hdx | | 0 | 0 | 0 | 0 | 0 |
| ***Subtotal*** | | ***9*** | ***5*** | ***3*** | ***3*** | ***4*** |
| **OUT** | | | | | | |
| Transplants | | 3 | 3 | 2 | 7 | 0 |
| Transfers to MPB | | 1 | 1 | 0 | 0 | 0 |
| Transfers to Incentre Hdx | | 1 | 1 | 0 | 1 | 1 |
| Transfers to Satellite | | 1 | 1 | 1 | 2 | 3 |
| Deaths | | 0 | 2 | 3 | 3 | 0 |
| ***Subtotal*** | | *6* | *8* | *6* | *13* | *4* |
| **NET GAIN/ LOSS** | | 3 | -3 | -3 | -10 | 0 |
| **Home haemodialysis patients at end of year** | | **36** | **33** | **34** | **24** | **24** |

## Anaemia, biochemistry and adequacy

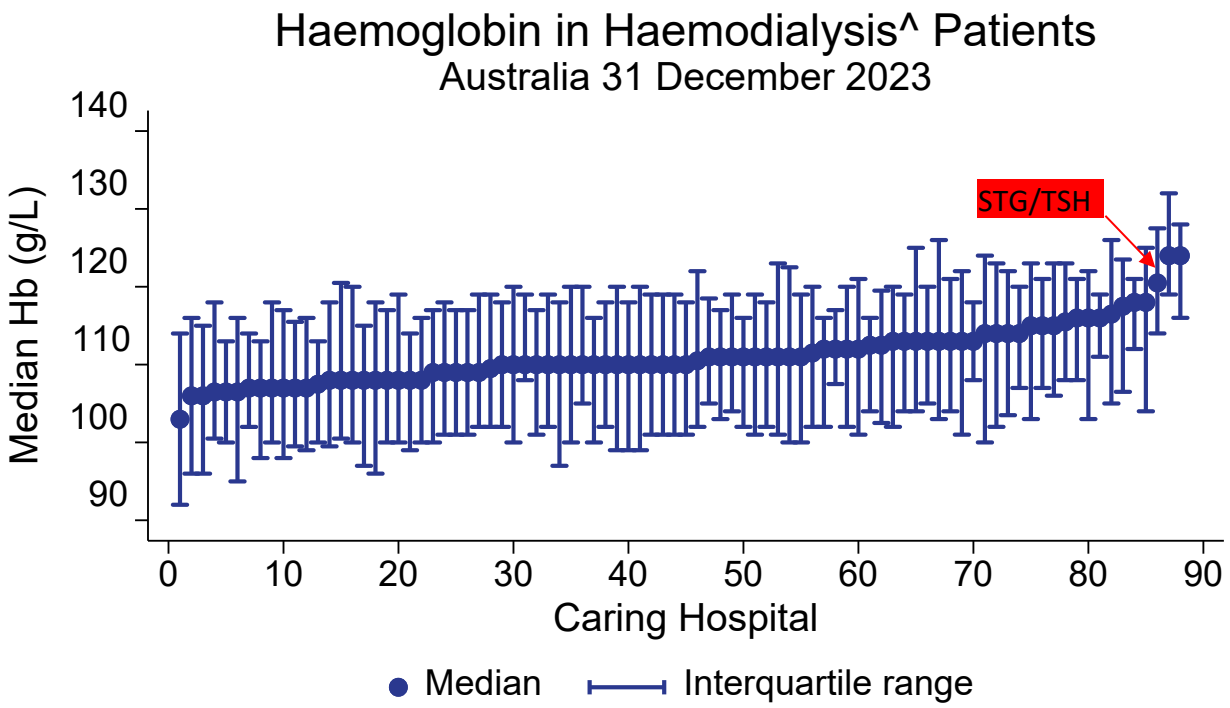
Key biochemical, haematopoietic and dialysis adequacy values are recorded on all in-centre haemodialysis patients in April and October. The data is pooled to derive mean or median values. Where confidence intervals are reported, these have been adjusted for intra-patient correlation. Where possible, local results have been compared to the most recently available ANZDATA report.

### Anaemia management

The median haemoglobin was 116/L (STD 13.4) and the proportion of patients with haemoglobin between 110 and 129 was 52% . At the time of data collection, on average, 75 % of patients were on erythropoietin stimulating agents (ESA), 4% currently had ESA withheld and 7% were not on ESA. Data for the remaining 14% was not known.



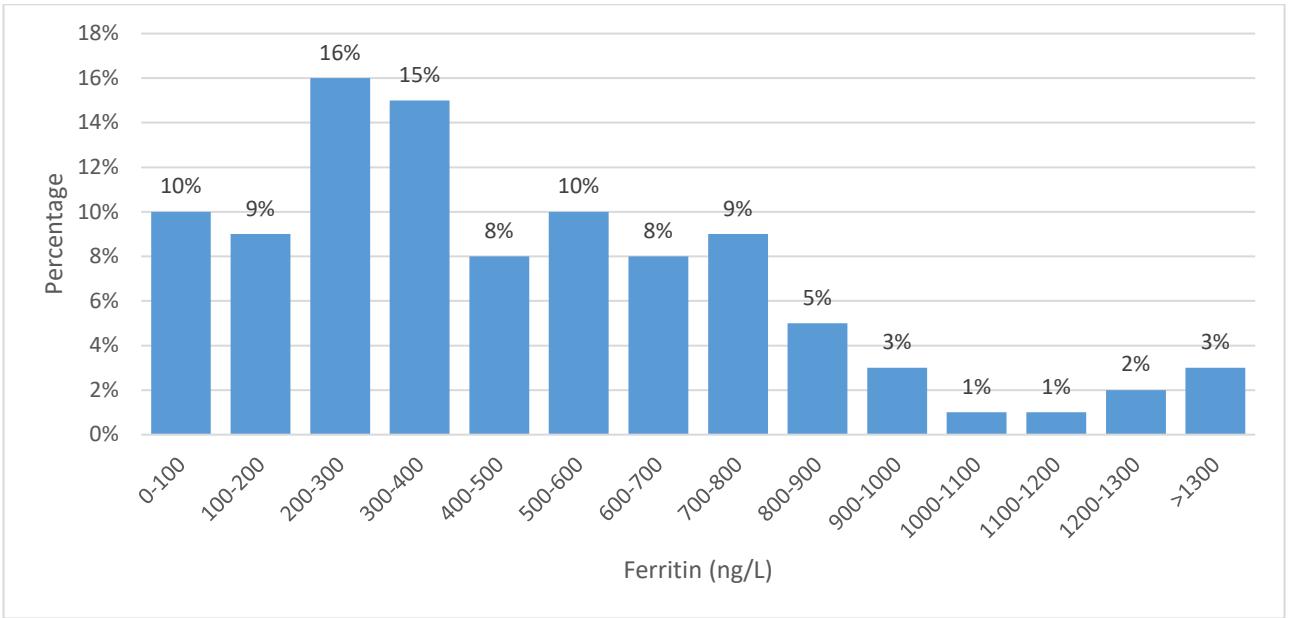

*Hemoglobin values in g/L of all dialysis patients (median 116; mean 114; STD 13.4)*



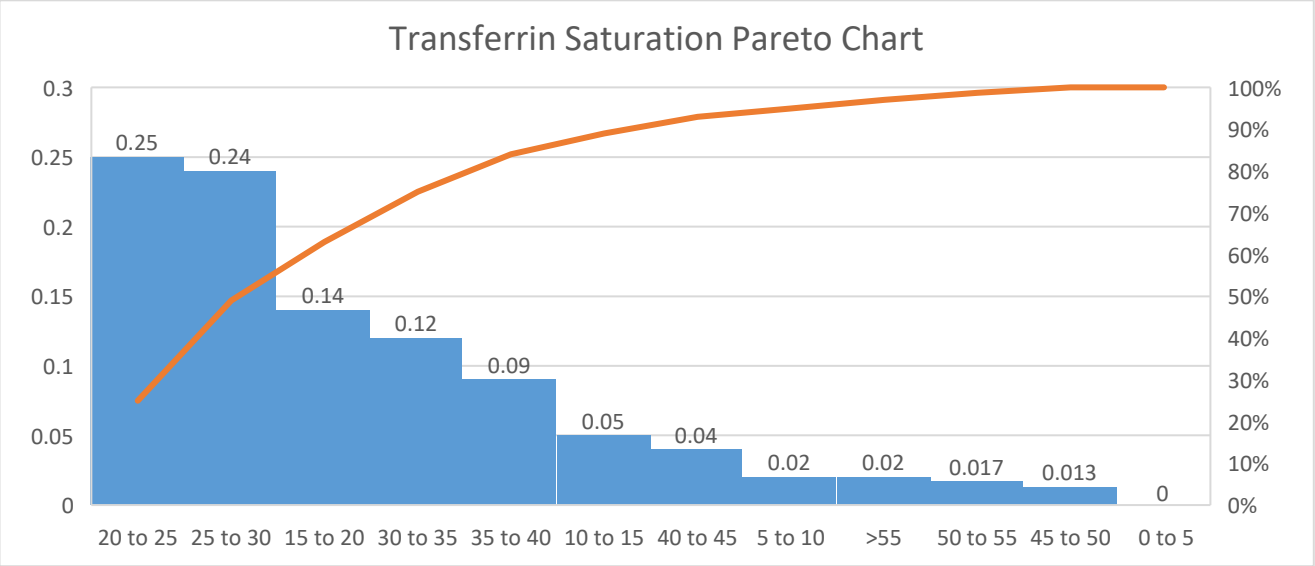

2024 ANZDATA Annual Report, Figure 4.40.1

***St George/Sutherland (red) and National Anaemia parameters (ANZDATA, 2024 Report)***

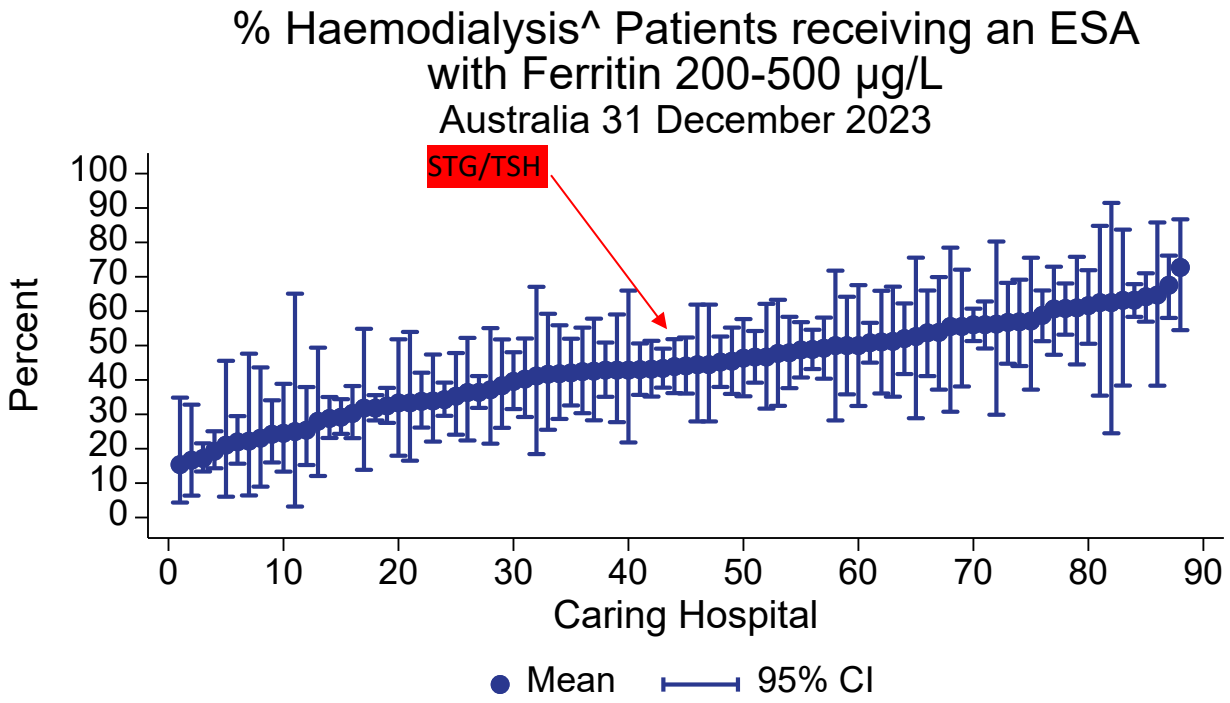
The mean ferritin value was 488ng/L (STD, 358) and median value was 412ng/L. Thirty eight percent (38%) of patients had a ferritin between 200 and 500ng/L. The mean transferrin saturation was 27% (STD, 10.3) and 75% had a transferrin saturation between 20 and 50%. Sixty six percent (66%) tests revealed ferritin between 200 and 800. Nineteen percent (19.3%) of tests revealed a ferritin level <200 and for transferrin saturation below 20%, this was only 21%.




*Ferritin values ng/L.*

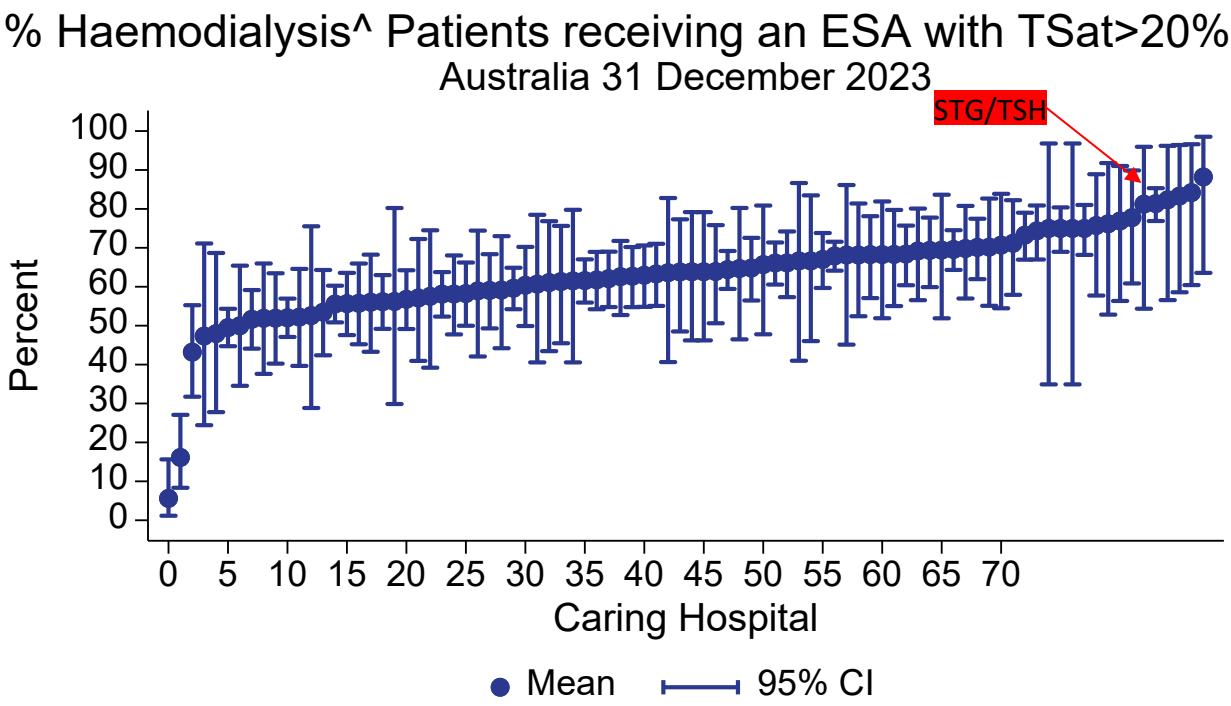



***Transferrin Saturation values (%).***




Excludes hospitals with <10 patients
^Includes Hybrid Dialysis

2024 ANZDATA Annual Report, Figure 4.42.1



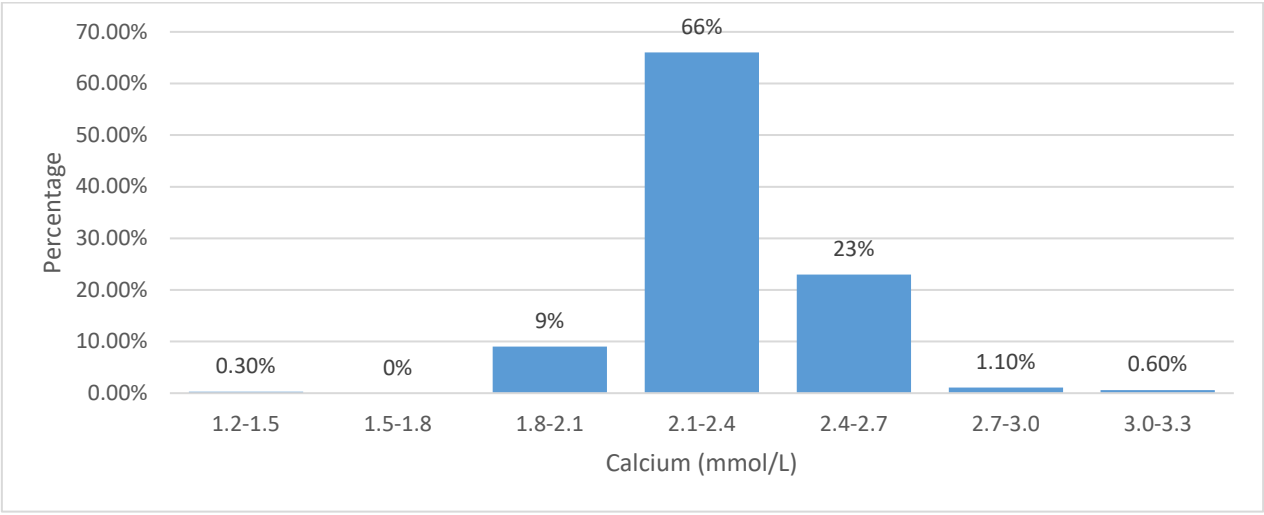

Excludes hospitals with <10 patients
^Includes Hybrid Dialysis

2024 ANZDATA Annual Report, Figure 4.43.1

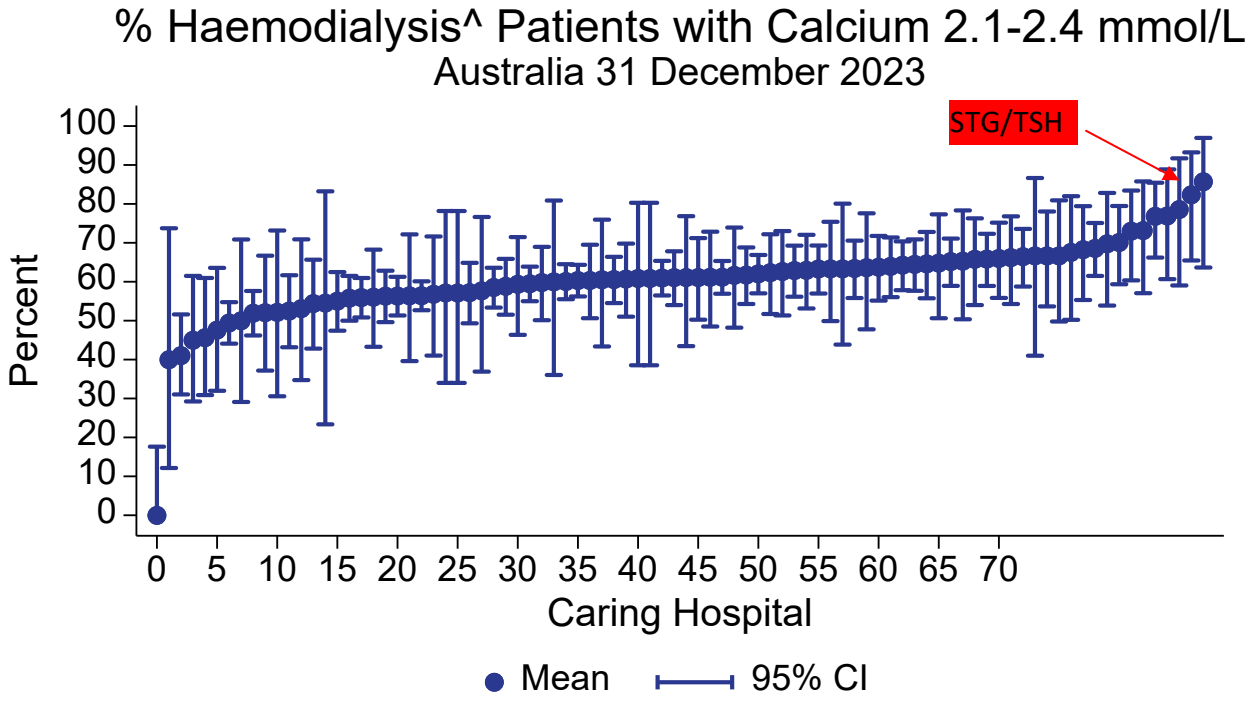
***St George/Sutherland (red) and National iron parameters (ANZDATA, 2024 Report).***

**Calcium, Phosphate and Parathyroid Hormone (PTH)**

The mean calcium was 2.31mmol/L (STD 0.18), with 66% of tests in the target range of 2.1 to 2.4mmol/L. The mean phosphate was 1.75mmol/L (STD 0.52) and 41% had phosphate in the range of 0.8 to 1.60mmol/L. The median PTH was 23.2mmol/L (STD 51.1) and there were 91% with a Parathyroid hormone level less than 95mmol/L.

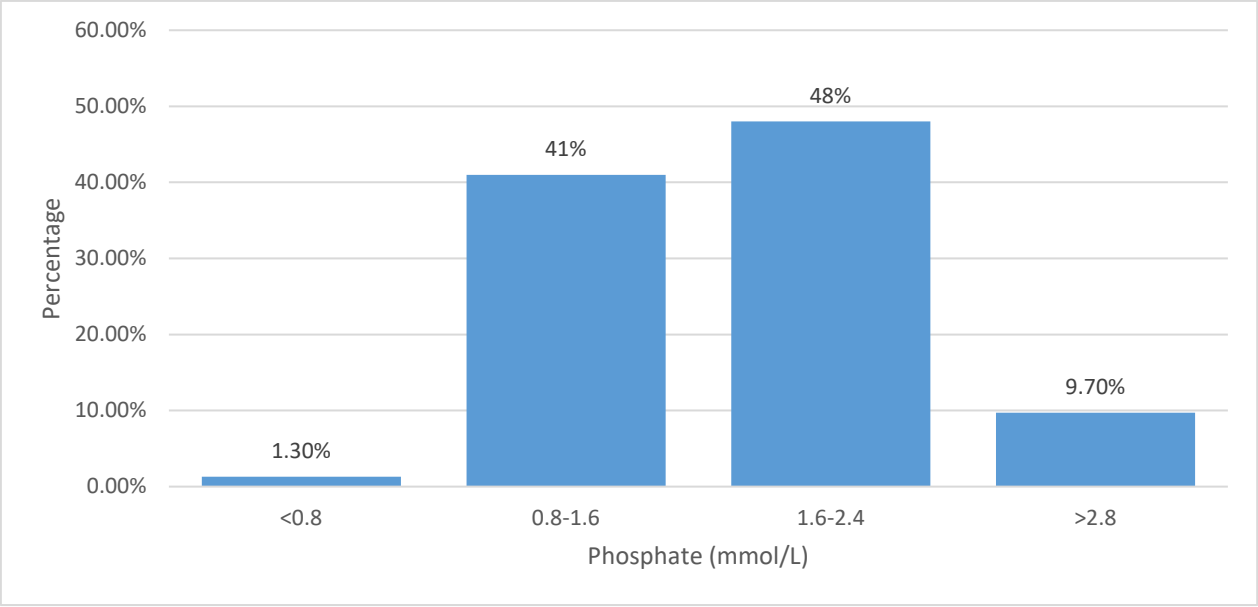



Calcium levels for all patients on dialysis.

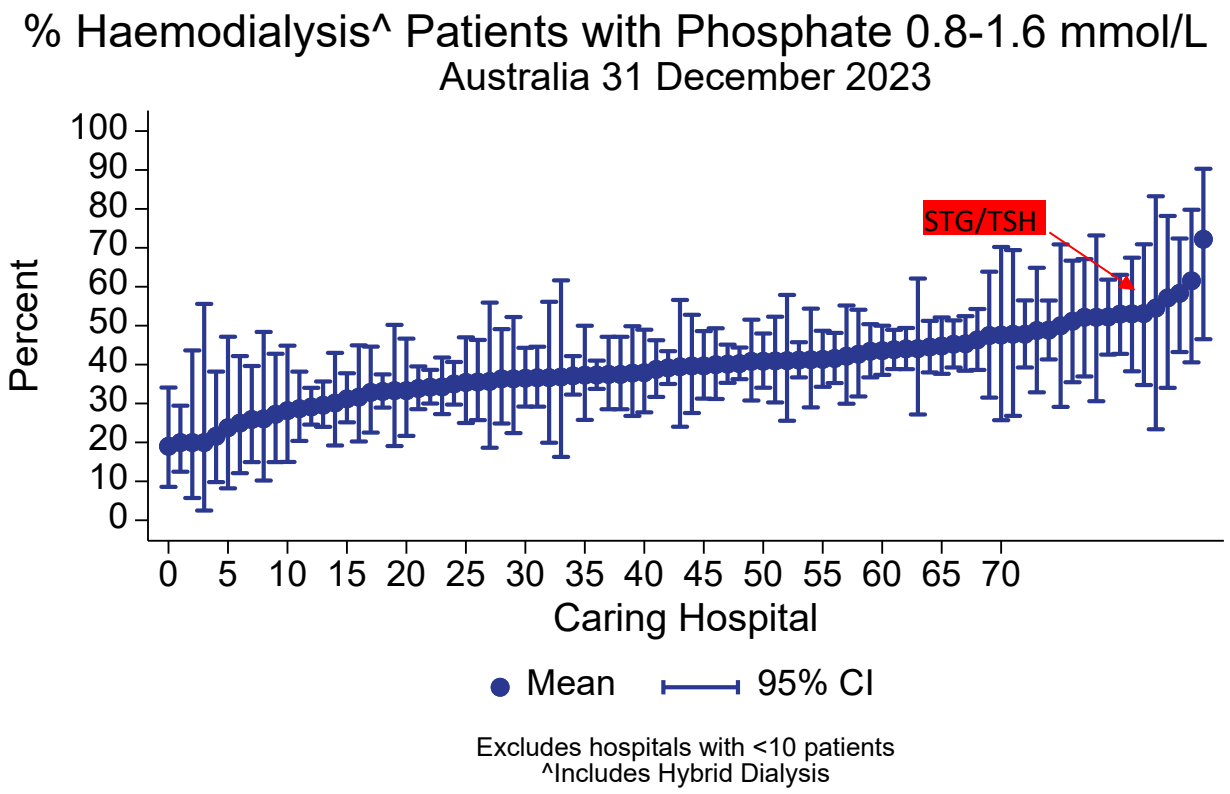



Excludes hospitals with <10 patients
^Includes Hybrid Dialysis

2024 ANZDATA Annual Report, Figure 4.44.1

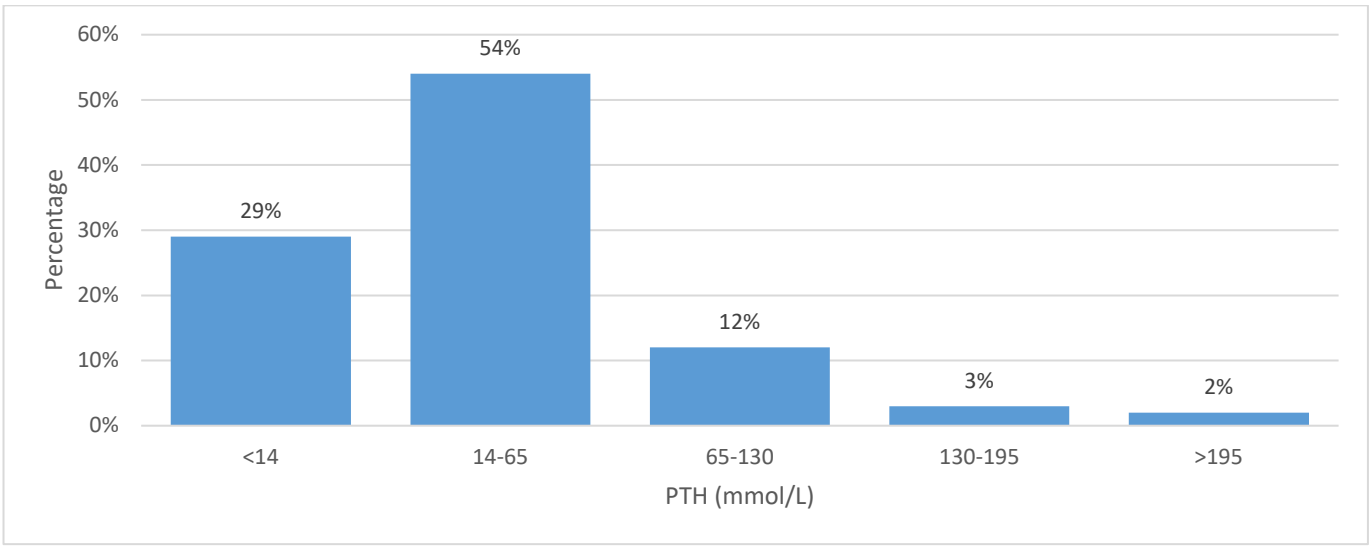



*Serum Phosphate levels for all patients on dialysis.*




2024 ANZDATA Annual Report, Figure 4.45.1

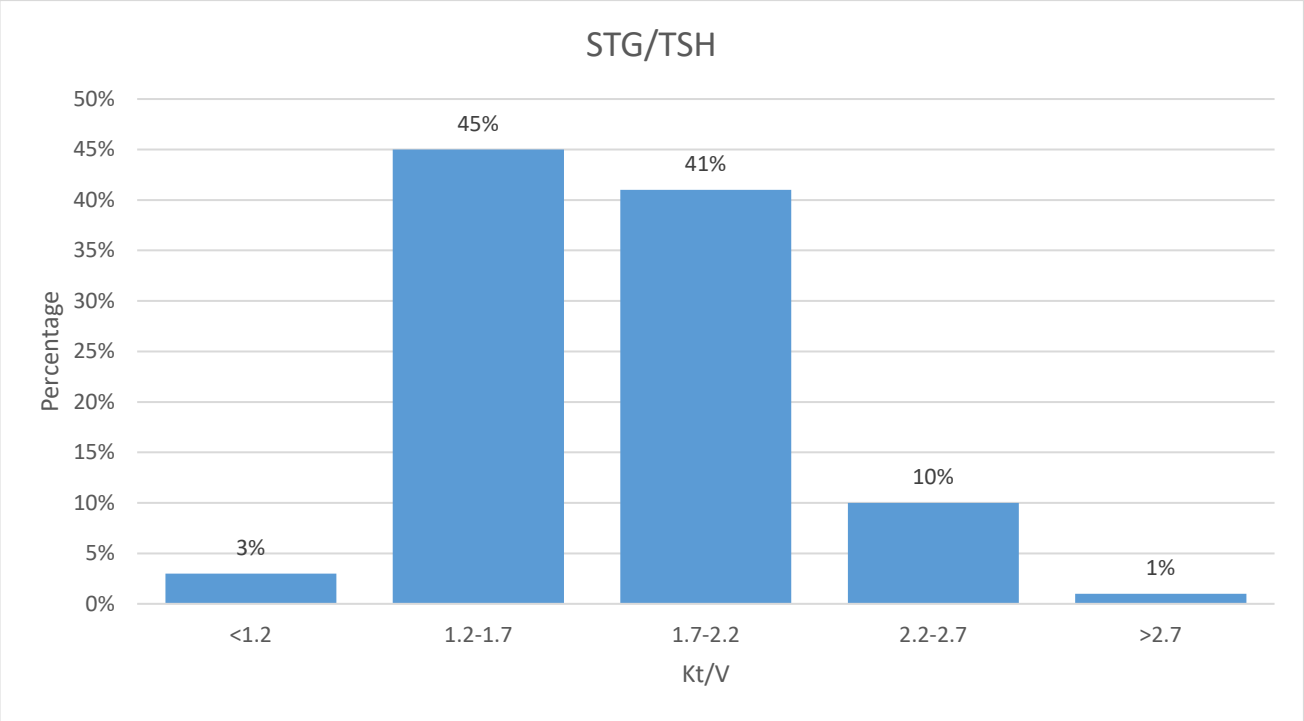
*St George/Sutherland (red) and National calcium and phosphate parameters (ANZDATA, 2024 Report).*



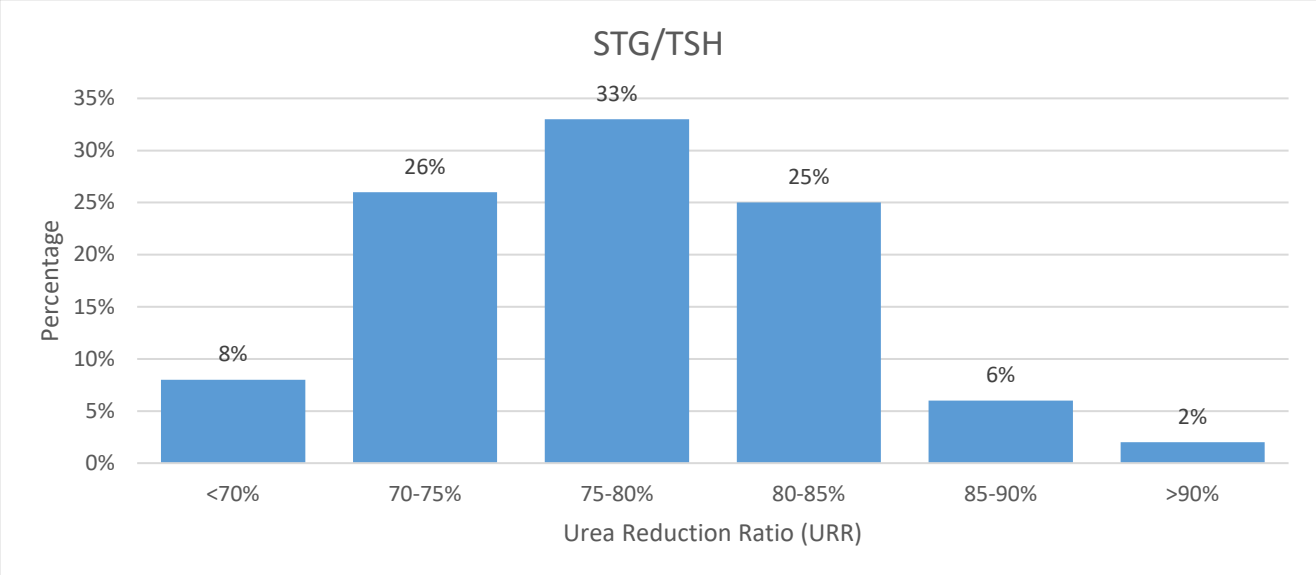

*Serum Parathyroid levels for all patients on dialysis.*

**Dialysis adequacy**

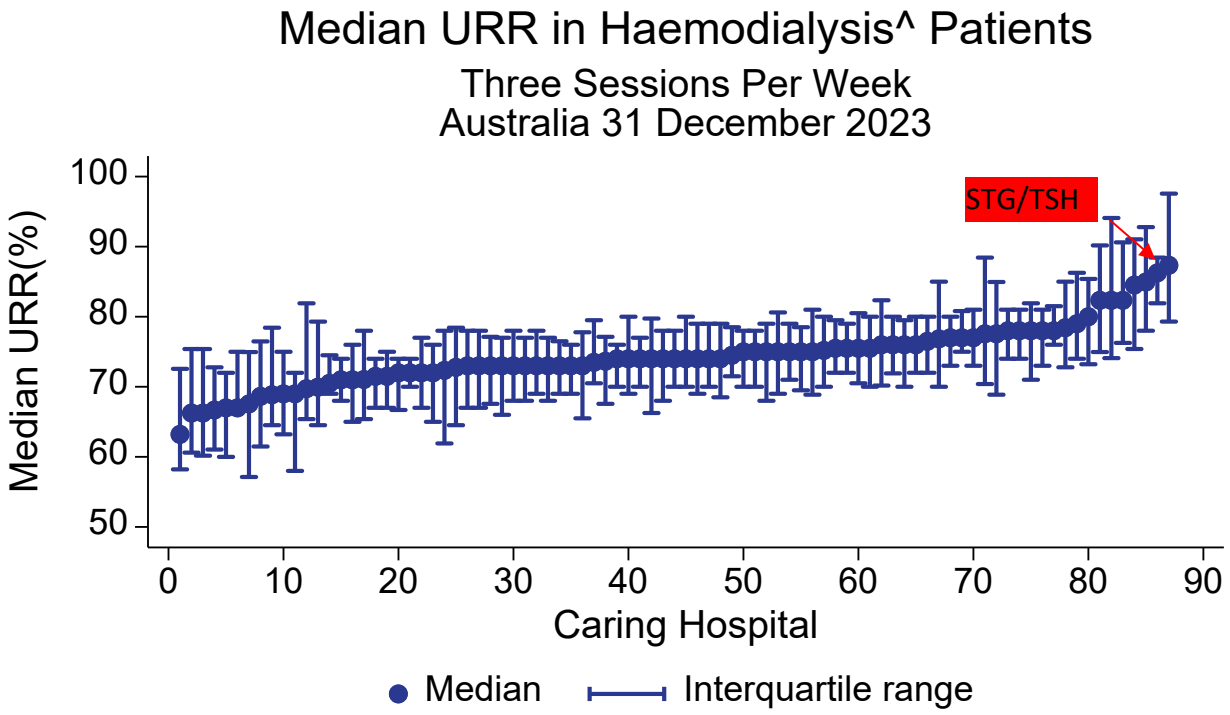
The mean urea reduction ratio was 77.1% (STD 7.3) and 92% of tests were 70% or greater. Mean Kt/V was 1.74 (STD 0.3476). 97% of Kt/V results have a value > 1.2.




*The Kt/v measure of adequacy for all dialysis – Mean of 1.74 (Target >1.2).*




*Urea Reduction Rate (URR) as a measure of dialysis adequacy – Mean 77.1% (Target >70%).*




2024 ANZDATA Annual Report, Figure 4.48.1

*St George/Sutherland (red) and National URR (ANZDATA, 2024Report)*

***Dialysis duration per individual dialysis session at St George and Sutherland Hospitals.***

| Duration (hours) | St George Hospital In-Centre HD (%) | Sutherland Hospital Satellite HD (%) | Fresenius Medical Centre Satellite HD (%) |
|---|---|---|---|
| < 4 | 0 | 1 | 1 |
| 4 | 35 | 35 | 24 |
| 4.5 – 4.75 | 35 | 41 | 26 |
| 5-6.5 | 30 | 23 | 41 |
| 7-7.5 | 0 | 0 | 8 |
| 8 | 0 | 0 | 0 |

- Almost 100% of in centre or satellite haemodialysis achieved the KPI of >15 hours on dialysis per week i.e. In-Centre 97%, Sutherland 100% and FMC 66% respectively.

## Home Haemodialysis 2024

***Home haemodialysis dose (hours on dialysis)***

| Duration (hours per week) | Home haemodialysis (n) | Frequency of dialysis |
|---|---|---|
| 8 hrs | 0 | |
| 12 -14 hrs | 5 | 3-4 x week = 15 |
| 15-17 hrs | 11 | Alternate days = 6 |
| 18-20 hrs | 4 | Nocturnal = 2 |
| 24-34 hrs | 2 | Total no. 24 |
| 40-42.5 hrs week | 1 | |
| HDF 15 hrs week | 1 | |

- Eleven patients (37%) are dialysing >15 hours week.
- Three patients are performing overnight (nocturnal) dialysis.
- Thirteen patients (48%) are dialysing on alternate days or more.

Seventeen patients (63%) are using an ESA.

**Summary**

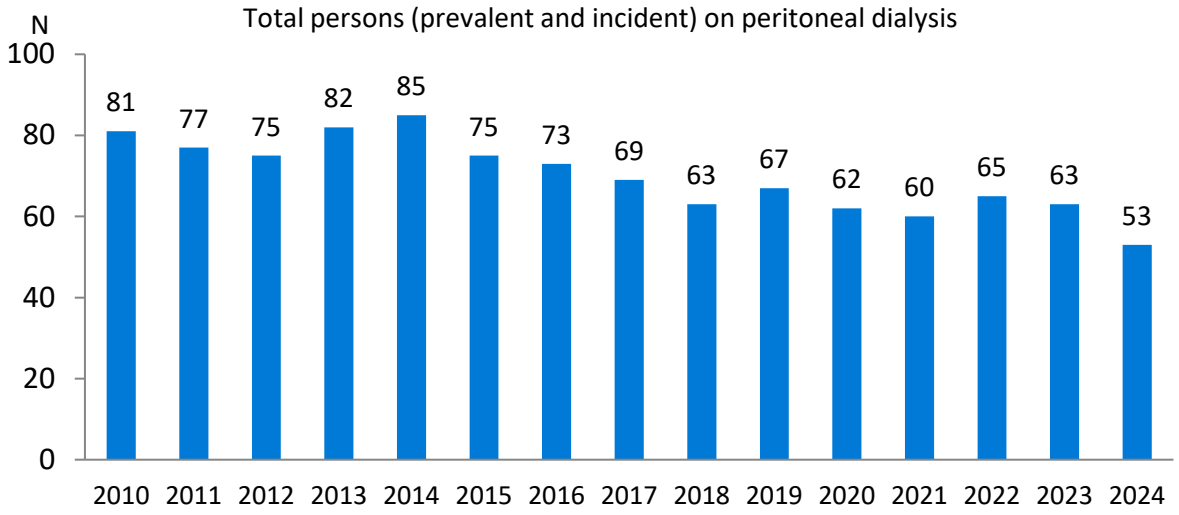
- The number of delivered treatments continues to increase, albeit at a slower rate than in the past.
- Our haemodialysis units were able to continue to offer the full gambit of options including in-centre, satellite, nocturnal and home haemodialysis
- With the addition of the Fresenius Medical Centre, we have been able to ensure a smaller in-centre dialysis population in keeping with other large city centres around the country
- Patient survival, biochemical and dialysis adequacy parameters remain consistent with or above the national averages.

# 10. PERITONEAL DIALYSIS

**Claire Cuesta, Dr. Franziska Pettit**

## Activity

In 2024, peritoneal dialysis (PD) was used by 14.3% of dialysis patients in St George, slightly lower than the 17% reported in the 47th Annual ANZDATA report (2024). A total of 53 patients received PD in 2024, compared to 63 in 2023. By December 2024, 92% of PD patients were on automated peritoneal dialysis (APD), while 8% were on continuous ambulatory peritoneal dialysis (CAPD). Our proportion of APD patients continues to exceed the ANZDATA – reported rate of 72%.




*Total persons (prevalent and incident) on peritoneal dialysis*

| | | |
|---|---|---|
| ***APD*** | *ANZDATA 72% (1917/2674)* | *St George 92% (33/36)* |
| ***CAPD*** | *ANZDATA 28% (757/2674)* | *St George 8% (3/36)* |

**PD patient flow**

| | | | |
|---|---|---|---|
| | **PD patients December 31st 2023** | | **34** |
| In | New Patients | 15 | |
| | Transfer from HD | 3 | |
| | Return from HD | 2 | |
| | Transfer from other unit | 1 | |
| | **In Subtotal** | | **21** |
| Out | Transplants | 4 | |
| | Transfer to other unit | 2 | |
| | Planned transfer to Haemodialysis (w/AVF) | 1 | |
| | Permanent transfer to Haemodialysis | 3 | |
| | Temporary transfer to Haemodialysis | 1 | |
| | Return to Haemodialysis | 2 | |
| | Withdrawal from dialysis | 2 | |
| | Deaths on PD | 4 | |
| | **Out Subtotal** | | **19** |
| | **Net gain** | **2** | |
| | **PD patients December 31st 2024** | | **36** |

**Pre-PD Assessment and Education Program**

The PrePD program is integral to preparing patients with end-stage renal disease (ESRD) for PD, providing comprehensive assessment and education sessions to ensure they are well prepared for PD. Key outcomes for 2024 include:

- **Patient Engagement:** 15 patients were scheduled for 27 prePD sessions.
- **Session Cancellations**: 3 sessions were cancelled or aborted by 2 patients due to changes in treatment decision and lack of family support.
- **Completion Rate:** 13 patients successfully completed 24 prePD sessions:
  - Assessment Outcome: All 13 were deemed suitable for PD.
  - PD Pathway Continuation: 11 patients continued on the PD pathway.
    - 10 patients underwent PD catheter insertions and started PD.
    - 1 patient is pending PD catheter insertion.
  - Alternative Pathways:
    - 1 patient opted for non-dialysis/renal supportive care pathway.
    - 1 patient returned to their out-of-area renal service.
- **Program Outcome:** 85% of patients who completed the PrePD program remained on the PD pathway.

**KPIs**

Peritoneal dialysis benchmarks were primarily established by ANZDATA, CARI, KDOQI, and ISPD.

**1. Dialysis Adequacy**

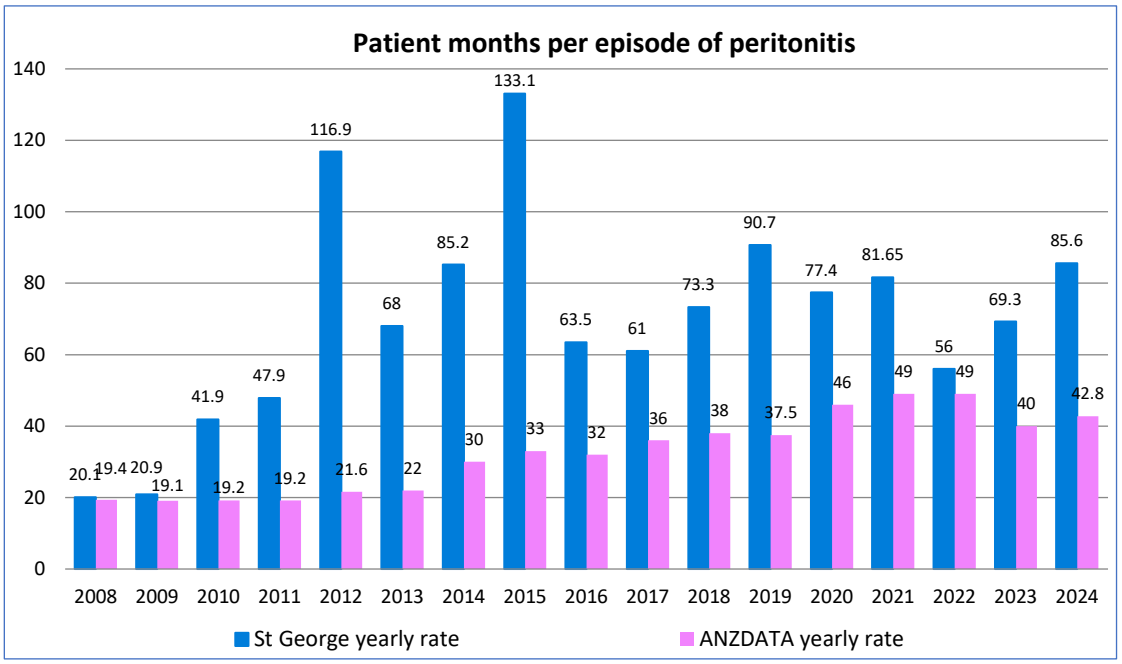
- PD adequacy is determined using solute clearance measurements:
  - Kt/V – Benchmarked against the KDOQI and ISPD target of at least 1.7 per week. In 2024, 84% of tested PD patients in St George met this target, with an average Kt/V of 2.2 (min 0.76, max 3.65).
  - Creatinine clearance – Benchmarked against the CARI target of 60 L/week/1.73 m2 in high and high-average peritoneal transporters and 50 L/week/1.73 m2 in low-average and low peritoneal transporters. In 2024, 68% of tested PD patients in St George met this target. The ISPD target for APD patients is >45 L/week/1.73 m², which 82% of tested APD patients achieved. The average creatinine clearance was 78.6 L/week/1.73 m² (min 25, max 134.34).

*Table 1. Dialysis adequacy*

| Parameter | Target | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| **KT/V** | ≥ 1.7 | 80% | 73% | 79% | 77% | 84% | 71% | 83% | 84% |
| **CCL** | >50L (L & LA) or >60L (H & HA) | 75% | 73% | 77% | 75% | 66% | 65% | 79% | 68% |
| **CCL (ISPD)** | >45L (for APD patients) | 84% | 95% | 89% | 82% | 79% | 75% | 86% | 82% |

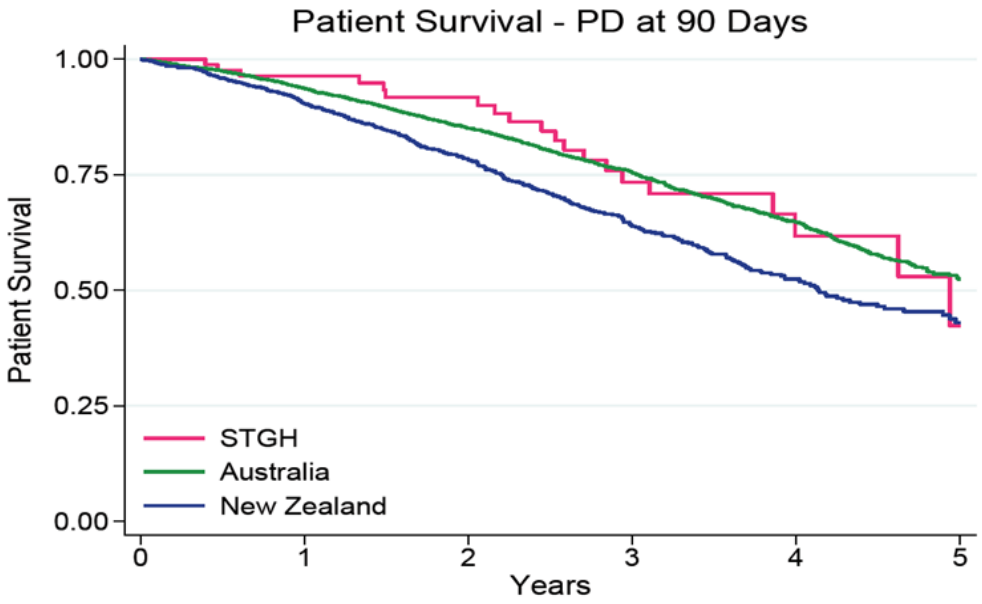
## 2. PD-related Infection rates

- Peritonitis episodes and rates
  - In 2024, the St George peritonitis rate was 85.6 patient months, continuing to surpass the national benchmark of 42.8 patient months (ANZDATA 2024).
  - 92% (33/36) of patients on peritoneal dialysis in 2024 were peritonitis-free, an improvement from 88% last year and above the ANZDATA rate of 79%.
  - 9.4% (5/53) of our patients in 2024 experienced peritonitis within one year, better than ANZDATA 2024 at 13%.
  - 90% of St George PD patients were peritonitis-free for 3 years, an improvement from 78% last year and higher than the ANZDATA 2024 rate of 52%.
  - Most peritonitis episodes in 2024 were caused by gram-positive organisms.
  - There have been no MRSA peritonitis cases since 2011 and no fungal peritonitis since 2021.
  -



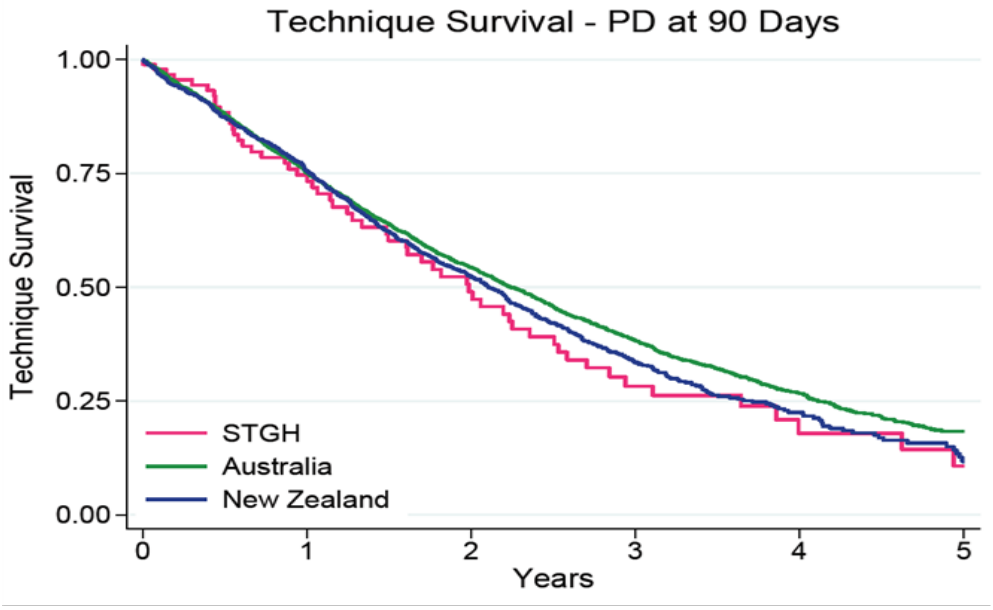
**3. Patient and Technique Survival**

- Survival is analysed from day 90 of treatment until death, with censoring at first transplant, loss to follow-up or recovery of renal function lasting >30 days. Data is from ANZDATA Individual Hospital Report 2018-2023. St George has better early patient and technique survival, whilst ANZDATA reports a slightly higher 5 – year survival rates for Australia.




| PD Patient Survival 2018-2023 | | | | | | |
|---|---|---|---|---|---|---|
| | STGH | | AUSTRALIA | | NEW ZEALAND | |
| Time | n | % Survival (95% CI) | n | % Survival (95% CI) | n | % Survival (95% CI) |
| 0 | 93 | 100.0 | 4865 | 100.0 | 1458 | 100.0 |
| 3 months | 87 | 100.0 | 4464 | 98.6 (98.3-98.9) | 1327 | 98.2 (97.4-98.8) |
| 6 months | 80 | 97.6 (90.7-99.4) | 4089 | 97.5 (97.0-97.9) | 1224 | 95.9 (94.7-96.9) |
| 1 year | 70 | 96.4 (89.1-98.8) | 3357 | 93.7 (92.9-94.4) | 1013 | 90.4 (88.6-91.9) |
| 2 years | 52 | 91.8 (82.5-96.3) | 2155 | 85.1 (83.8-86.3) | 635 | 78.2 (75.5-80.6) |
| 3 years | 30 | 73.4 (59.1-83.3) | 1217 | 75.5 (73.8-77.1) | 354 | 64.0 (60.6-67.2) |
| 4 years | 13 | 61.8 (43.6-75.6) | 559 | 64.7 (62.5-66.9) | 156 | 52.5 (48.3-56.4) |
| 5 years | 4 | 42.3 (18.0-65.0) | 193 | 52.4 (49.2-55.5) | 48 | 42.9 (37.7-48.1) |

*Table 2. PD Patient Survival – PD at 90 days. ANZDATA individual hospital report 2018 -2023*




| PD Technique Survival 2018-2023 | | | | | | |
|---|---|---|---|---|---|---|
| | STGH | | AUSTRALIA | | NEW ZEALAND | |
| Time | n | % Survival (95% CI) | n | % Survival (95% CI) | n | % Survival (95% CI) |
| 0 | 93 | 100.0 | 4865 | 100.0 | 1458 | 100.0 |
| 3 months | 83 | 95.6 (88.6-98.3) | 4245 | 93.8 (93.1-94.5) | 1263 | 93.5 (92.1-94.7) |
| 6 months | 72 | 88.4 (79.4-93.6) | 3696 | 88.1 (87.1-89.0) | 1111 | 87.4 (85.5-89.0) |
| 1 year | 54 | 73.3 (62.2-81.5) | 2690 | 75.0 (73.7-76.3) | 838 | 75.4 (73.0-77.7) |
| 2 years | 30 | 49.0 (36.9-60.0) | 1379 | 54.4 (52.7-56.0) | 412 | 52.2 (49.1-55.2) |
| 3 years | 14 | 28.3 (17.7-39.8) | 610 | 38.2 (36.3-40.1) | 179 | 33.5 (30.2-36.8) |
| 4 years | 6 | 17.9 (8.60-30.0) | 215 | 26.7 (24.6-28.8) | 54 | 22.5 (19.0-26.2) |
| 5 years | 3 | 10.7 (3.30-23.2) | 62 | 18.3 (15.9-20.8) | 13 | 11.7 (7.90-16.4) |

*Table 3. PD Technique Survival – PD at 90 days. ANZDATA individual hospital report 2018 -2023*

**4. Technique Failure/PD discontinuation**

- ANZDATA 2024 reported "total dialysis/technical failure" as the leading cause of PD discontinuation (excluding death and transplant) at 34%, followed by social reasons and withdrawal from dialysis at 27%. In St George, the major causes of PD discontinuation in 2024 were similar to ANZDATA with "total dialysis/technical failure" at 46%, mostly due to blocked catheters, followed by social reasons and withdrawal from dialysis at 27%.

*Table 4. Reasons for Technique Failure or PD Discontinuation*

| Reasons for Technique Failure or PD discontinuation | 2014 n=17 | 2015 n=9 | 2016 n=14 | 2017 n=13 | 2018 n=11 | 2019 n=10 | 2020 n=14 | 2021 n=18 | 2022 n=13 | 2023 n=24 | 2024 n=11 | ANZDATA 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Infective | 23% | 0% | 18% | 21% | 18% | 10% | 14% | 10% | 0% | 4% | 9% | 26% |
| Total Dialysis/ Technical Failure (catheter blockage, hernia and inadequate dialysis) | 60% | 89% | 64% | 65% | 64% | 50% | 57% | 60% | 61% | 75% | 46% | 34% |
| Social/Withdrawal (psychosocial and frailty) | 17% | 11% | 18% | 14% | 9% | 10% | 14% | 20% | 31% | 21% | 27% | 27% |
| Other causes (hospital transfer) | 0% | 0% | 0% | 0% | 9% | 30% | 14% | 10% | 8% | 0% | 18% | 7% |
| Reason not reported | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 6% |

**Summary**

1. ANZDATA results serve as the benchmark for comparing St George outcomes.
2. APD remains the preferred PD therapy.
3. St George continues to have low peritonitis rates:
   a. Peritonitis rates are consistently better than national data.
   b. The percentage of patients free from peritonitis at 3 years remains higher than ANZDATA.
   c. 92% of PD patients were peritonitis – free by the end of 2024.
   d. One patient was transferred to haemodialysis due to peritonitis.
   e. No MRSA peritonitis since 2011 and no fungal peritonitis since 2021.
4. "Total dialysis and technical failure," primarily due to PD catheter blockage, remained the leading cause of PD discontinuation, consistent with the national data and previous years' results.
5. St George PD patient survival remained high at 42.3% at 5 years, while technique survival declined to 10.7%, with ANZ showing slightly higher 5 – year survival rates.
6. 84% of patients met the Kt/V target of ≥1.7 and 82% of APD patients achieved the ISPD creatinine clearance target. Dialysis adequacy results remained stable despite a slight decline from the previous year.

**Management: Clinical and QA activities**

- **Patient Satisfaction Survey results** – The patient satisfaction survey, conducted between October to December 2024, had a 64% response rate, with 23 out of 36 surveys returned.
  - Overall Management of Care: Patients expressed high satisfaction with the PD nurses, rating them 100% for professionalism, support, and responsiveness, with 100% agreeing that the advice was clear, easy to understand, and the environment was welcoming.
  - Educational & Support Needs: Patients found the educational resources, especially the PD newsletter, useful and valuable, although interest in additional and group education sessions or meeting other patients was low. Most patients reported good access to technical devices.
  - Claria APD Machine & Sharesource Feedback: Most patients found the Claria APD machine easy to use, received sufficient training, and felt supported by Sharesource. However, some reported poor sleep quality due to alarms, drain pain, or toileting needs.

- Open Comments and Feedback from Patients: Many patients praised the PD nurses for their excellent care, support, and positive attitude. Several expressed gratitude for saving their lives and keeping them healthy. Some mentioned after-hours support and adjusting to PD challenges.
- Recommendations:
  - Continue the 6 monthly PD newsletter to maintain patient education and engagement.
  - Continue daily remote monitoring and review of PD therapy outcomes in the Sharesource platform to ensure ongoing support and timely interventions.
  - Maintain patient training curriculum and practices.
  - Continue monitoring and offering support for bowel management and PD catheter flow issues.
  - Repeat survey in 2026 to evaluate ongoing patient satisfaction and identify evolving needs.

- **Ongoing Effective Initiatives and Projects:**
  - Clinic review checklist project
  - Nurse-led iron management program
  - Regular patient newsletters
  - PD retraining program
  - Pre-PD assessment and education for PD pathway patients
- **Ongoing Patient Monitoring Activities:**
  - Flag patients with poor biochemistry, hematology, and dialysis clearance results through renal clinic, multi-disciplinary patient review meetings and electronic communication with nephrologists.
  - HbA1c screening for diabetic patients and lipid screening for high-risk patients.
  - Daily PD outcome remote monitoring through the Sharesource platform.
- **Ongoing Nursing Education Programs for PD Care:**
  - Progressive competency-based training for renal ward nurses in:
    - CAPD, APD, and Sharesource remote monitoring.
    - Basic and Advanced PD knowledge and skills.
    - Five-yearly PD competency re-assessment and re-training.
  - Mentorship program to enhance PD knowledge for identified PD champions in the renal ward and emergency department.
  - Monthly CAPD in-service and competency – based training for emergency department nurses.
  - Ad hoc PD catheter care and management in-service and competency – based training for 6 West Rehabilitation Ward nurses.
- **Ongoing PD Policy Review:**
  - Review PD policies every three years to align with national (CARI) and international (ISPD) clinical practice guidelines.

# 11. TRANSPLANTATION

**Tania Burns**

**Aim**

The aim of this report is to provide data about patients who have had renal transplant and are under the care of a St George Hospital (SGH) nephrologist. It will also provide data about patients who are potential renal transplant recipients currently listed on the transplant waiting list and about living renal donors under the care of a SGH nephrologist.

**Highlights**

- A total of 273 kidney transplant recipients and 75 living kidney donors were under the care of the SGH team during 2024.
- Sixteen SGH patients received a kidney transplant in 2024: five from live donors and eleven from deceased donors. One of the live donor transplants was pre-emptive.
- Five people donated a kidney.
- A total of 78 pre-transplant recipients were reviewed at the SGH transplant clinic by a nephrologist from Prince of Wales hospital, the transplanting unit.
- At 31/12/24 53 SGH dialysis patients were on the transplant waiting list and two SGH donor/recipient pairs were enrolled in the paired kidney exchange. Another seven people are fully assessed and suitable for activation when they start dialysis.
- Two pre-transplant patient education events were held in 2024: one in English which 24 people attended and one in Mandarin with 8 attendees.

**Transplant patient flow**

| | | |
|---|---|---|
| **1/1/2024 SGH transplant recipients registered with ANZDATA** | | **255** |
| Out | Transferred care out | 4 |
| | Died | 8 |
| | Graft failure returned to dialysis | 5 |
| **Subtotal out** | | **-17** |
| In | Transplanted | 16 |
| | Transferred care in | 2 |
| **Subtotal in** | | **18** |
| Net change | | +1 |
| **31/12/24 total SGH transplant patients** | | **256** |

**Post-transplant follow-up**

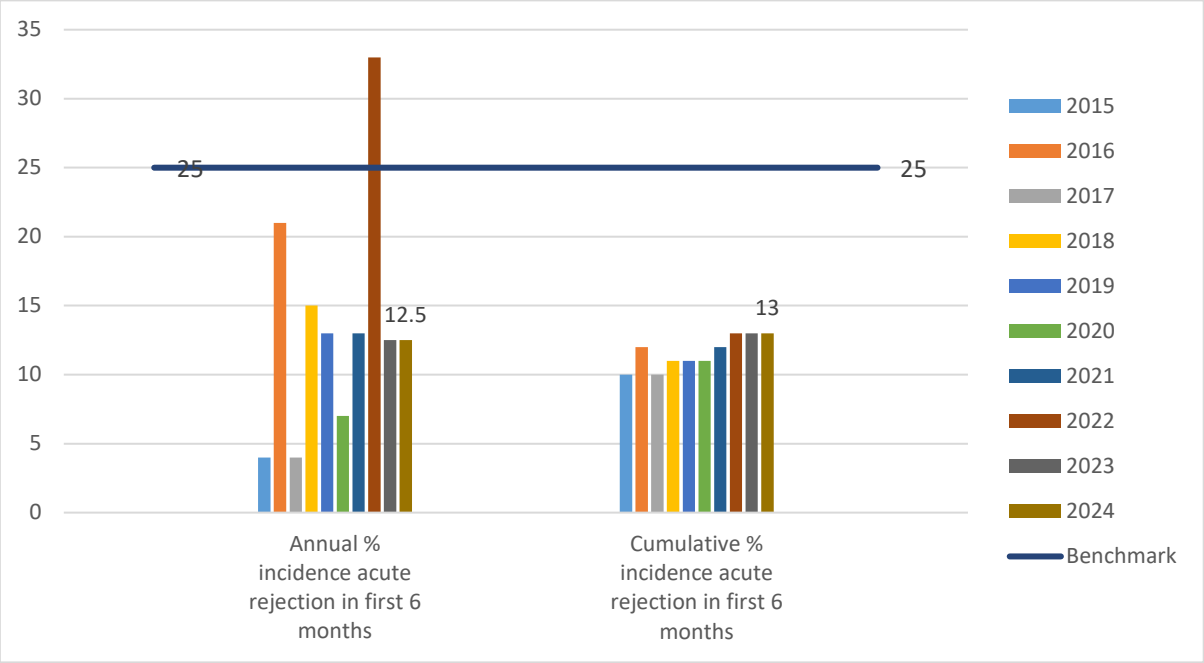
Of the 273 kidney transplant recipients cared for at SGH in 2024:

- 254 were primary grafts, 15 second grafts and 4 third grafts.
- 90 of these patients received grafts from live donors.
- 34 were pre-emptive transplants.

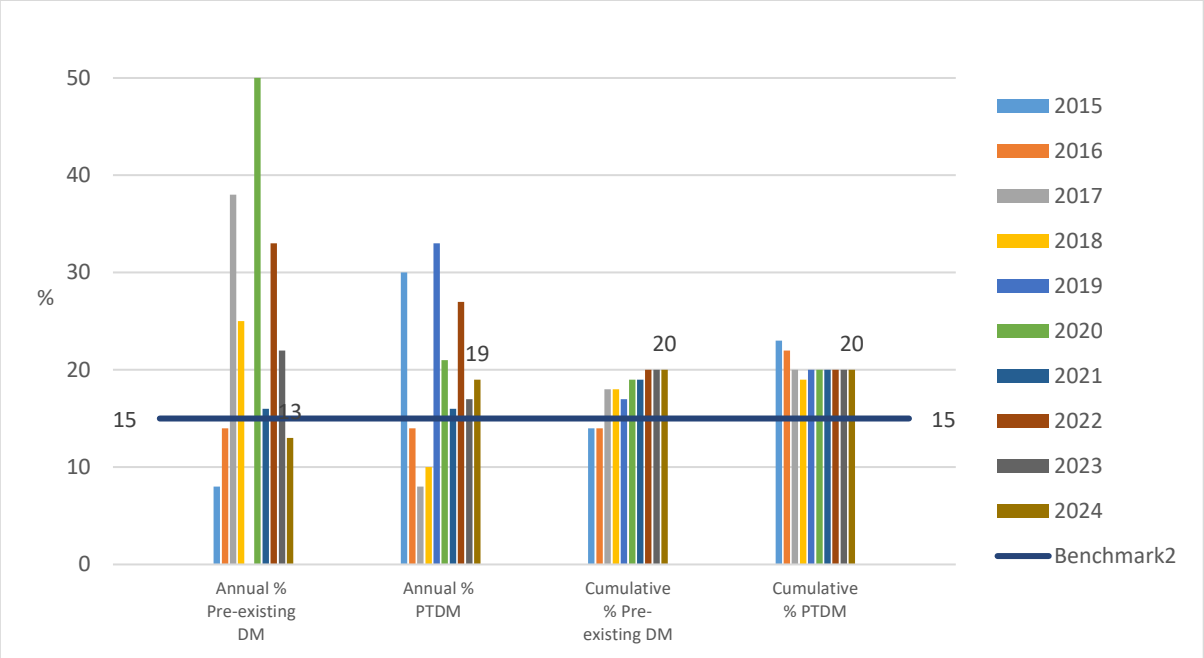
**KPIs to 12 months post-transplant:**

- Rates of biopsy proven acute rejection in first 6 months <25%in the first 6 months post-transplant and <5% between 6 and 12 months or after 12 months
- Rates of new onset diabetes after transplant (NODAT) <15%
- Rates of BK nephropathy <5%
- Rates of BK viraemia <15% (where BK viraemia defined as >850copies per ml)
- Rates of CMV viraemia <30% (CMV viraemia defined as PCR CMV measurement > 500 copies/mL)
- Rates of CMV infection <30%

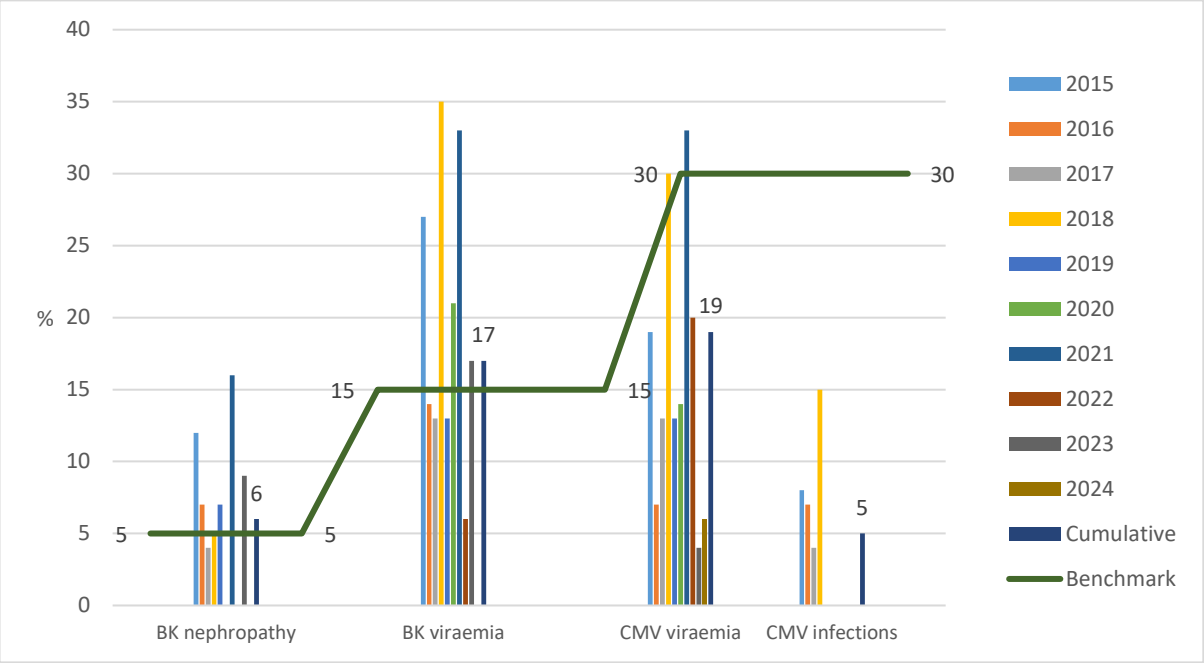
In the first 12 months post-transplant SGH renal transplant recipients demonstrate rates of acute rejection, CMV viraemia and CMV infection below the benchmarks, while rates of NODAT, BK viraemia, and BK nephropathy are above benchmark.




*Rate of biopsy proven acute rejection in first 12 months*




*Rate of diabetes in first 12 months*




*Infection in first 12 months*

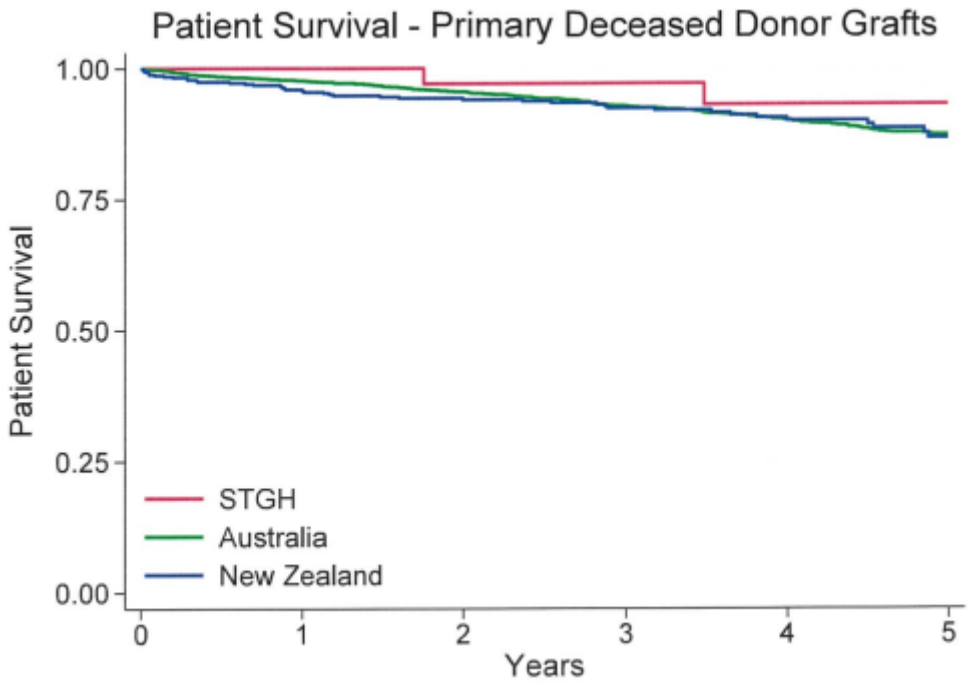
## Graft and Patient Survival ANZDATA report for transplants 2018-2023; n=84

**Benchmarks are against the national average**

1. **Deceased Donors**
   Compared with national data, SGH recipients of deceased donor organs have better than national patient and graft survival.

| | STGH | | Australia | | New Zealand | |
|---|---|---|---|---|---|---|
| Time | n | % Survival (95% CI) | n | % Survival (95% CI) | n | % Survival (95% CI) |
| 0 | 58 | 100.0 | 3653 | 100.0 | 528 | 100.0 |
| 3 months | 58 | 100.0 | 3425 | 99.2 (98.8-99.4) | 494 | 98.3 (96.7-99.1) |
| 6 months | 51 | 100.0 | 3259 | 98.5 (98.0-98.8) | 470 | 97.5 (95.7-98.5) |
| 1 year | 42 | 100.0 | 2933 | 97.7 (97.1-98.2) | 428 | 95.7 (93.5-97.2) |
| 2 years | 31 | 97.1 (80.9-99.6) | 2347 | 95.5 (94.7-96.2) | 335 | 94.0 (91.5-95.9) |
| 3 years | 27 | 97.1 (80.9-99.6) | 1822 | 92.8 (91.7-93.7) | 253 | 92.4 (89.3-94.6) |
| 4 years | 20 | 93.0 (74.4-98.2) | 1271 | 90.1 (88.8-91.3) | 170 | 90.0 (86.2-92.8) |
| 5 years | 14 | 93.0 (74.4-98.2) | 624 | 87.2 (85.6-88.7) | 74 | 86.6 (81.3-90.5) |

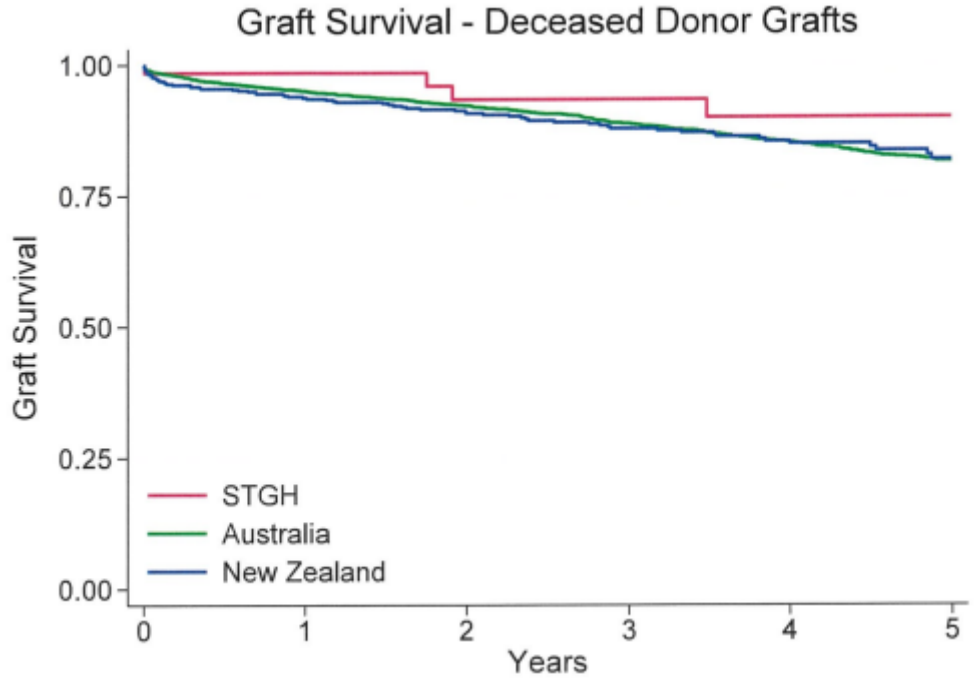
*Patient survival for primary deceased donor grafts (ANZDATA Individual Hospital Report 2018-2023 (Table 11))*




*Patient survival – Primary deceased donor grafts (ANZDATA Individual Hospital Report 2018-2023)*

| | STGH | | Australia | | New Zealand | |
|---|---|---|---|---|---|---|
| Time | n | % Survival (95% CI) | n | % Survival (95% CI) | n | % Survival (95% CI) |
| 0 | 65 | 100.0 | 4173 | 100.0 | 583 | 100.0 |
| 3 months | 63 | 98.5 (89.6-99.8) | 3857 | 97.7 (97.2-98.1) | 535 | 96.2 (94.3-97.5) |
| 6 months | 56 | 98.5 (89.6-99.8) | 3650 | 96.5 (95.9-97.0) | 506 | 95.5 (93.4-96.9) |
| 1 year | 47 | 98.5 (89.6-99.8) | 3258 | 95.0 (94.3-95.7) | 457 | 93.7 (91.3-95.4) |
| 2 years | 36 | 93.4 (80.5-97.9) | 2575 | 92.2 (91.3-93.0) | 358 | 90.7 (87.8-92.9) |
| 3 years | 32 | 93.4 (80.5-97.9) | 1955 | 88.8 (87.6-89.8) | 271 | 87.8 (84.4-90.5) |
| 4 years | 23 | 90.0 (74.5-96.3) | 1360 | 85.2 (83.8-86.5) | 180 | 84.9 (80.9-88.1) |
| 5 years | 15 | 90.0 (74.5-96.3) | 668 | 81.6 (79.8-83.2) | 78 | 81.9 (76.8-86.0) |

*Graft survival for deceased donor grafts (ANZDATA Individual Hospital Report 2018-2023 (Table 15))*



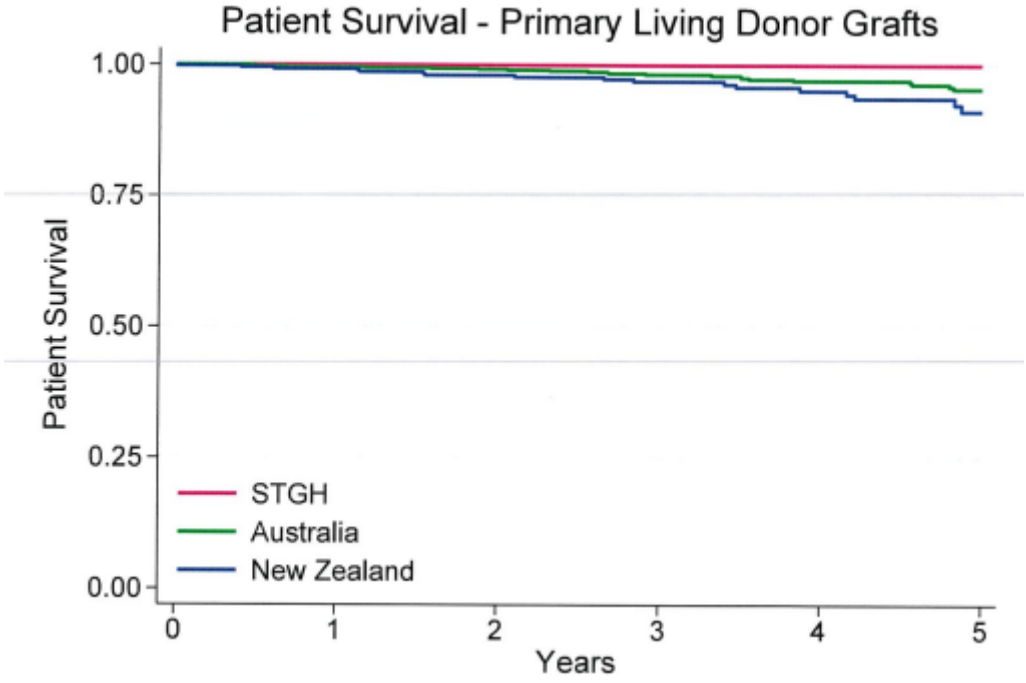

*Graft survival - Primary deceased donor grafts (ANZDATA Individual Hospital Report 2018-2023)*

**Live Donors**

- Compared with national data SGH recipients of living donor organs have better than national patient and graft survival.

| | STGH | | Australia | | New Zealand | |
|---|---|---|---|---|---|---|
| Time | n | % Survival (95% CI) | n | % Survival (95% CI) | n | % Survival (95% CI) |
| 0 | 18 | 100.0 | 1108 | 100.0 | 421 | 100.0 |
| 3 months | 18 | 100.0 | 1036 | 100.0 | 405 | 99.8 (98.3-100.0) |
| 6 months | 18 | 100.0 | 980 | 99.8 (99.2-99.9) | 388 | 99.5 (98.1-99.9) |
| 1 year | 18 | 100.0 | 888 | 99.6 (98.9-99.8) | 357 | 99.3 (97.7-99.8) |
| 2 years | 13 | 100.0 | 702 | 99.2 (98.3-99.6) | 291 | 98.1 (96.0-99.1) |
| 3 years | 11 | 100.0 | 534 | 98.2 (96.9-99.0) | 215 | 96.9 (94.2-98.3) |
| 4 years | 7 | 100.0 | 382 | 97.1 (95.4-98.2) | 139 | 95.1 (91.5-97.2) |
| 5 years | 2 | 100.0 | 187 | 95.5 (92.9-97.2) | 67 | 91.2 (85.1-94.9) |

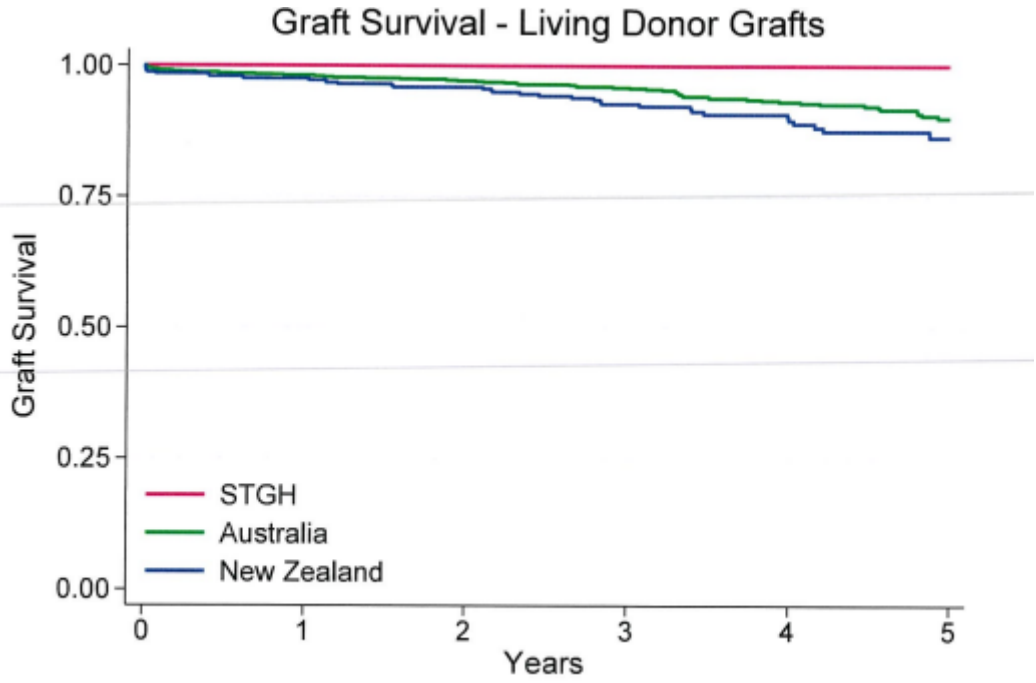
*Patient survival for primary living donor grafts (ANZDATA Individual Hospital Report 2018-2023 (Table 12))*




*Patient survival - primary living donor grafts (ANZDATA Individual Hospital Report 2018-2023)*

| | STGH | | Australia | | New Zealand | |
|---|---|---|---|---|---|---|
| Time | n | % Survival (95% CI) | n | % Survival (95% CI) | n | % Survival (95% CI) |
| 0 | 19 | 100.0 | 1231 | 100.0 | 464 | 100.0 |
| 3 months | 19 | 100.0 | 1138 | 98.8 (98.1-99.3) | 438 | 98.5 (96.9-99.3) |
| 6 months | 19 | 100.0 | 1073 | 98.6 (97.7-99.1) | 419 | 98.0 (96.2-99.0) |
| 1 year | 19 | 100.0 | 970 | 98.2 (97.2-98.8) | 383 | 97.6 (95.6-98.6) |
| 2 years | 14 | 100.0 | 761 | 97.2 (96.0-98.0) | 310 | 95.9 (93.5-97.5) |
| 3 years | 12 | 100.0 | 573 | 95.9 (94.3-97.0) | 223 | 92.7 (89.4-95.0) |
| 4 years | 8 | 100.0 | 405 | 93.2 (91.0-94.8) | 142 | 89.5 (85.2-92.7) |
| 5 years | 2 | 100.0 | 190 | 90.1 (86.9-92.5) | 67 | 86.3 (80.7-90.4) |

*Graft survival for living donor grafts (ANZDATA Individual Hospital Report 2018-2023 (Table 17))*

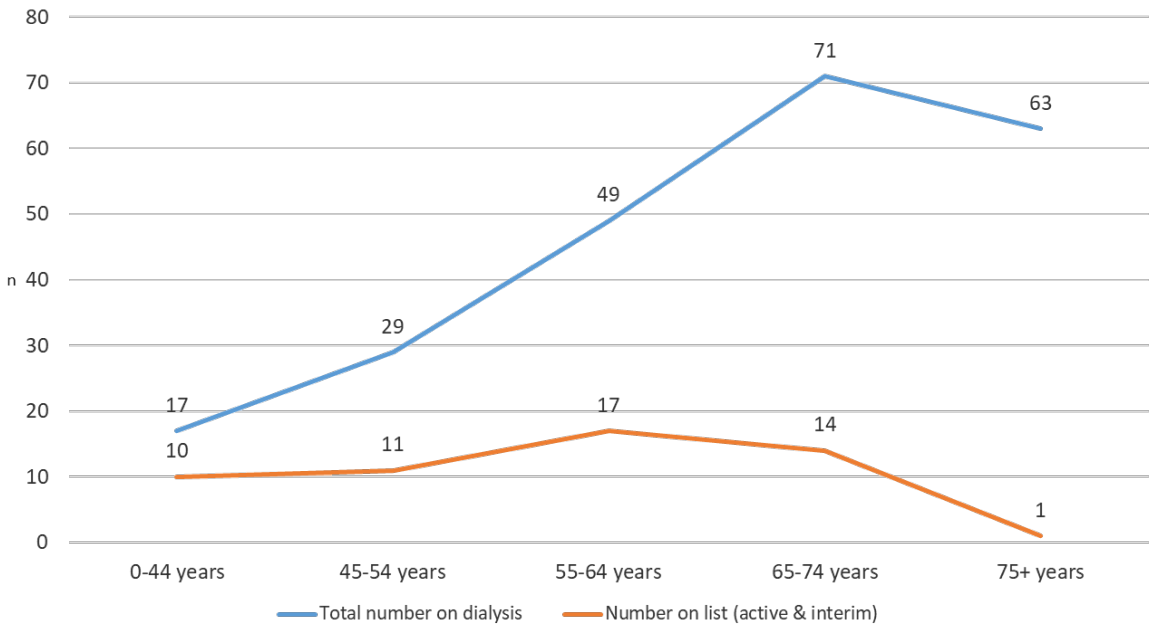



*Graft survival for living donor grafts (ANZDATA Individual Hospital Report 2018-2023)*

## 2. Waiting list data

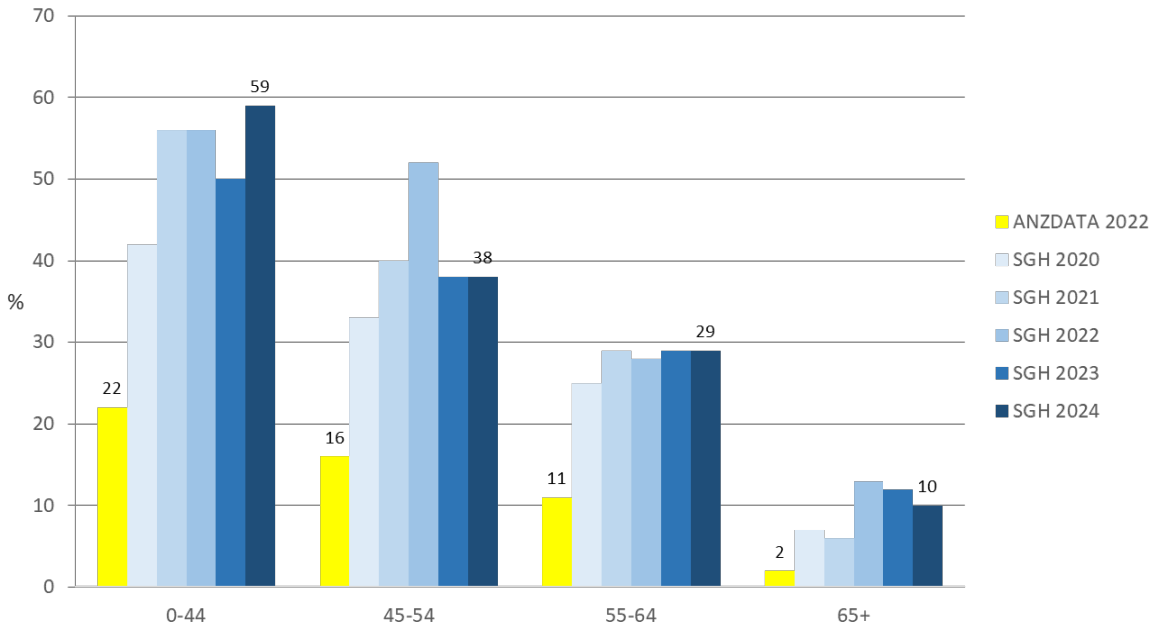
**KPI**:

- All dialysis patients under 75years to have their suitability for transplant assessment reviewed.




*Number of people on dialysis and on the transplant waiting list Aug 2024*

Although the numbers are small, the percentage of patients listed for transplant in each age group compares favourably with the national figures reported in ANZDATA. Reasons for dialysis patients not being listed include comorbidities such as coronary artery disease, peripheral vascular disease, chronic infection or malignancy. Some patients have also expressed their preference to remain on dialysis and not pursue a transplant.




*Percentage of SGH/TSH dialysis patients listed for transplant compared to ANZDATA 46th Annual Report 2023 (Data to 2022)*

3. **Living kidney donor data**

**KPIs:**

- All living kidney donors to be reviewed annually
- Living donor assessment to be completed in <12months

At 31/12/24 there were seventy-three living kidney donors under the care of SGH nephrologists.

- During 2024 sixty-four donors (88%) attended for review.
- Donors who did not attend for review in 2024 were followed up by letter.
- Among the donors there was one death unrelated to donation, and no one on dialysis.
- Twenty-one SGH renal donors reviewed in 2024 have CKD stage 3A (GFR 45-59) and five have CKD stage 3B (GFR 30-44). Creatinine ranged from 57-145umol/L and eGFR from 41->90mL/min/1.73m$^2$.
- Twenty donors had hypertension requiring treatment, with twelve requiring one agent, five requiring two agents, two requiring three agents and one four agents. Five of these people had known hypertension at the time of donation and ten were diagnosed more than 10 years after donation. The age of donors at the time of diagnosis of hypertension ranged from 44-74 years.

**Renal Donor patient flow**

| | | |
|---|---|---|
| **1/1/2024 SGH living kidney donors registered with ANZDATA** | | **71** |
| Out | Transferred care out | 2 |
| | Died | 1 |
| | Lost to follow up | 0 |
| **Subtotal out** | | **-3** |
| In | Donated | 5 |
| | Transferred care in | 1 |
| **Subtotal in** | | **+6** |
| Net change | | +3 |
| **31/12/24 total SGH living kidney donors** | | **74** |

Five people who completed their donor assessment with the SGH transplant coordinator donated a kidney during 2024. The process of donor assessment from referral to the SGH coordinator to kidney donation ranged from 36 weeks – 136 weeks.

Thirty-eight people contacted the SGH transplant coordinator in 2024 to enquire about being assessed as living kidney donors. Nine started the assessment and were unsuitable to proceed due to medical reasons. Eight potential donors did not make any progress after the initial phone call. Nine were from different states and were referred to units in their state to do the assessment. At 31/12/24 a total of fifteen people were continuing in donor assessment at SGH. Three of those are fully assessed and ready to donate, and two pairs are enrolled in the paired kidney exchange.

# 12. KIDNEY SUPPORTIVE CARE SERVICE

**Dr. Frank Brennan, Dr. Kelly Li, Dr Daniel O'Hara, Elizabeth Josland, Alison Smyth, Jessica Dawson, Danielle Horne, Maya Young, Xiaobing Ma**

**Overview**

- Information on current research, guidelines, patient resources, educational materials, and presentations is available in the Kidney Supportive Care section of the Renal Department website: https://stgrenal.org.au/

## KSC Service Activity

| Year | STG CLINIC Visits | (% new referrals) | TSH CLINIC TOTAL | (% new referrals) | CNC OOS | Dietitian OOS | SW OOS |
|---|---|---|---|---|---|---|---|
| 2009 | 115 | 33% | | | 115 | | |
| 2010 | 224 | 19% | | | 258 | | |
| 2011 | 409 | 13% | | | 746 | | |
| 2012 | 482 | 10% | | | 988 | | |
| 2013 | 383 | 12% | | | 1172 | | |
| 2014 | 300 | 9% | 99 | 12% | 1186 | | |
| 2015 | 268 | 10% | 81 | 9% | 1586 | 24 | 6 |
| 2016 | 305 | 6% | 137 | 12% | 1862 | 92 | 77 |
| 2017 | 281 | 14% | 141 | 15% | 1859 | 78 | 50 |
| 2018 | 366 | 11% | 133 | 12% | 2350 | 177 | 128 |
| 2019 | 349 | 10% | 136 | 8% | 2080 | 238 | 255 |
| 2020 | 499 | 7% | 92 | 4% | 2411 | 352 | 231 |
| 2021 | 588 | 5% | 108 | 9% | 1832 | 339 | 404 |
| 2022 | 474 | 8% | 185 | 6% | 1700 | 337 | 413 |
| 2023 | 419 | 9% | 125 | 8% | 1594 | 227 | 309 |
| 2024 | 437 | 10% | 120 | 9% | 1599 | 287 | 361 |
| Total | 5899 | 8% | 1357 | 10% | 23338 | 2153 | 2234 |

*KSC Activity 2009-2024*

## KSC Patient Demographics

The demographics of patients seen by the KSC service during their initial visit/consultation are summarized in the table below.

| | CKM | Dialysis | Transplant | Other |
|---|---|---|---|---|
| No. of patients | 882 | 563 | 79 | 109 |
| Gender (Male) | 57% | 62% | 64% | 57% |
| Age (median) | 84(IQR 9) | 74(IQR 15) | 60(IQR 18) | 76(IQR 14) |
| eGFR (median) | 14(IQR 8) | | 16(IQR 24) | 21(IQR 19) |
| Diabetes (%) | 44% | 51% | 49% | 40% |
| IHD (%) | 49% | 53% | 34% | 39% |
| Dementia (%) | 10% | 5% | 0% | 3% |
| 2 or more co-morbidities (%) | 78% | 80% | 61% | 75% |
| Current or former smokers (%) | 15% | 29% | 20% | 15% |

*Patient demographics on first visit/ consult 2009-2024*

## Advance Care Plans

Advance care plans are a standard practice within the clinic, including annual reviews.

- In 2024, 83% of competent CKM patients attending the KSC clinic had an advance care plan completed. Overall, 97% of those patients had an ACP either completed or discussed.

- At the beginning of each year, nephrologists receive a list of their current dialysis patients to identify those in need of an ACP, using the "Surprise Question" as a screening tool. In 2024, 61% (n=49) of the 80 dialysis patients identified as needing an Advance Care Plan (ACP) had one completed. Overall, 92% of the identified patients either had an ACP completed or discussed.

## Performance indicators and outcomes for 2024

1. **Symptom and functional state assessment in KSC clinic**

- All consenting or competent patients had an IPOS-Renal symptom survey and Karnofsky performance scale measured during each visit to the KSC clinic. These assessments are utilized to identify individual functional issues and track changes over time.

- All dialysis and transplant patients are offered the opportunity to complete an IPOS (renal) symptom survey and a QOL-EQ-5D-5L every 6 months. These clinical tools are used biannually for each patient to monitor progress and identify any issues.

- CKM patients seen by KSC at their first visit: On average, patients reported 7 out of 15 positive iPOS physical symptoms, with a mean iPOS score of 22 out of 90. The most reported symptoms were "Weakness or lack of energy" (82%), "Poor mobility" (76%), "Pain" (62%), and "Shortness of breath (SOB)" (59%).

- KRT patients seen by KSC at their first visit: On average, patients reported 7 out of 15 positive iPOS physical symptoms, with a mean iPOS score of 27.2 out of 90. The most frequently reported symptoms were "Weakness or lack of energy" (87%), "Difficulty sleeping" (74%), "Itching" (68%), and "Pain" (66%).

- Of all patients seen in the KSC Clinic since 2009, 58% experienced a reduction in their total symptom score by the third clinic visit.

- Among patients with at least three visits, 34% reported severe or overwhelming pain at their first visit, with 72% showing a reduction in pain scores by the third visit.

- 50% of patients (CKM and KRT) demonstrated an improvement or maintained their functional status (Karnofsky Score) between their first and most recent visits to the KSC clinic.

**2. Nutritional assessment**

- Of dietetic consultations 76% CKM and 24% were for symptom support

- KSC SGA assessment at first visit:

| | A | B | C |
|---|---|---|---|
| CKM | 56% | 38% | 6% |
| KRT | 54% | 41% | 5% |

- 85% demonstrated an improvement or maintained their Nutritional status between their first and most recent visits to the KSC clinic.

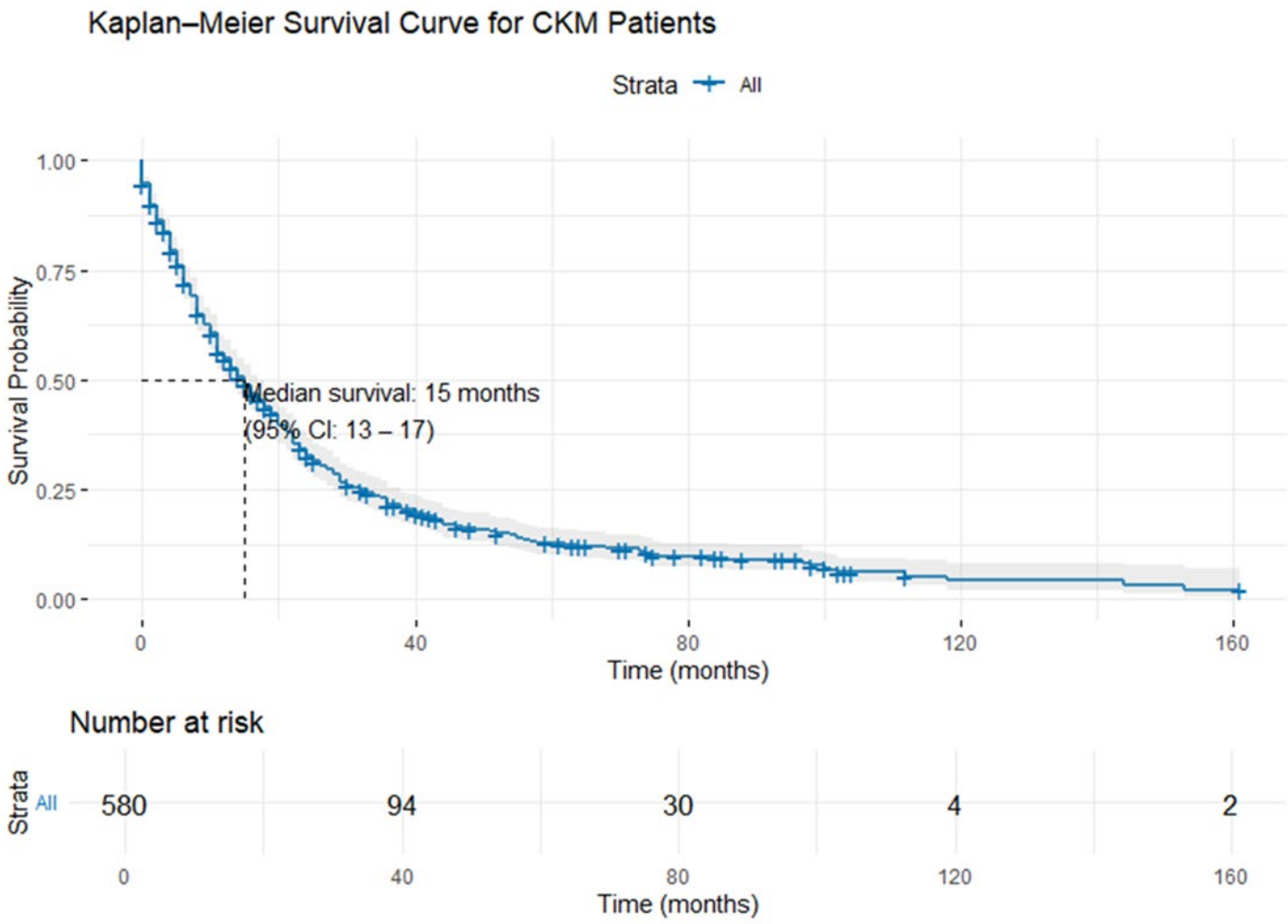
**3. Social worker**

- The renal memorial service at STG held on 29 May 2024 received highly positive feedback, reflecting ongoing appreciation from family and friends of our past patients.
- In 2024, 56% of all newly referred KSC patients had a consultation with a social worker. Among them, 90% of CKM patients also received social worker support.

**4. Survival**

- Estimated survival probability at 12 months: 54.8 %
  Estimated survival probability at 24 months: 32.5 % (580 patients seen at KSC clinic in

total ). The mean eGFR is 15.8 (SD 7.8), median eGFR is 14.5 (IQR 8).




## 5. 2024 hospitalisation rate (Terminal admission excluded)

| 2024 | No Hospitalisation | Hospitalisation Once | Hospitalisation Twice or more | Total Patients | |
|---|---|---|---|---|---|
| KSC CKM Patients | 82 (64%) | 21 (16%) | 25 (20%) | 128 | statistically significant(p-value = 0.04763) |
| Dialysis Patients | 130 (50%) | 58 (23%) | 68 (27%) | 256 | |

## 6. KSC PREM outcomes

- 100% of patients felt they were treated with respect and dignity while at the clinic or service.
- 100% of patients rated the care they received at the clinic or service as good or very good.

## Publications (2024)

1. Davison SN, Pommer W, **Brown MA, Li,K.C.,Brennan,F.P**., et al. Conservative kidney management and kidney supportive care: core components of integrated care for people with kidney failure. Kidney Int. 2024;105(1):35-45.
2. **McLean CM**, Randall AM, Ryan M, **Dawson J**. The association of frailty and malnutrition with dietary intake and gastrointestinal symptoms in people with kidney failure: a 2-year prospective study. J Ren Nutr. 2024 Mar;34(2):177-184.
3. Gois PH, Saunderson RB, Wainstein M, **Li CK**, Damasiewicz MJ, Miao VY, et al. Protocol for a hybrid effectiveness-implementation clinical trial evaluating video-assisted electronic consent vs standard consent for patients initiating and continuing haemodialysis in Australia (eConsent HD). BMJ Open. 2024 Jul 1;14(7): e081181.
4. **Li CK**, Turner K, **Brennan F, Brown M**. WCN24-532 Obtaining meaningful informed consent for chronic dialysis - from zero to 100. Kidney Int Rep. 2024 Apr 1;9(4): S53-54.
5. So S, **Li KC**. Prognostication after dialysis withdrawal. Kidney Int Rep. 2024 Apr 24; 9(7): 2117-2124.
6. **Brennan FP**. The pathogenesis of CKD-associated pruritus: a theoretical model and relevance for treatment. Kidney 360. 2024;5(11):1727-1738.

## Education Days and Teaching

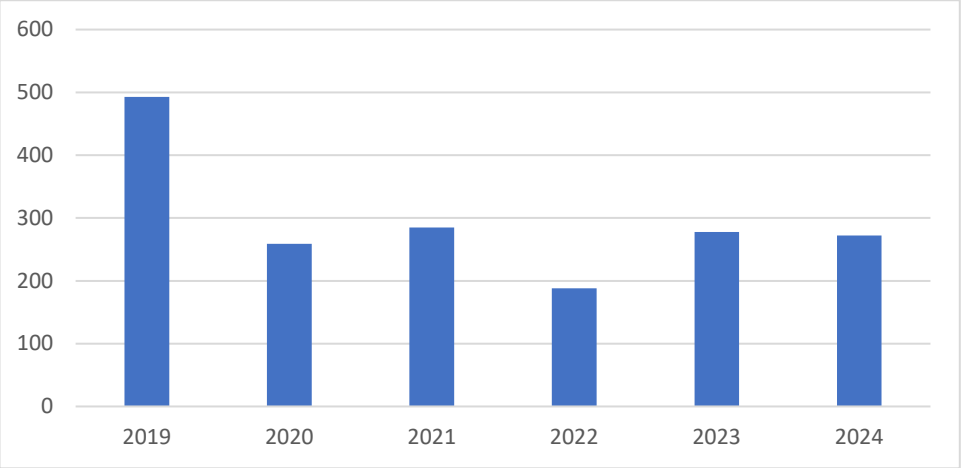
- In 2024, a total of 14 visitors, including international ones, visited STG KSC, spread across 50 working days throughout the year.
- Dr Brennan and E Josland presented at a PEPA KSC Workshop in Queanbeyan, NSW on November 28th.
- Alison Smyth and Elizabeth Josland provided 5 educational presentations to the South Africa National Renal Care group of nurses who are setting up a KSC service.
- The KSC Hub day was run on September 13th at RNSH
- Elizabeth Josland presented virtually at a Singapore Vifor event on November 2nd, the topic being ‘Building a comprehensive CKD care team’ with a focus on CKD-AP (CKD Associated Pruritus)

# 13. HYPERTENSION

**Dr. George Mangos, Jennifer Beddoe**

## Twenty four hour ABPM monitoring

During 2024 two hundred and seventy two monitors were performed. Thirteen of these were on pregnant women and the remaining two hundred and fifty nine were for general clinical purposes.




*Total number of ABPM's 2019-2024*

## Home monitor checks

During 2024 twelve home monitor checks were competed.

## Hypertension Studies

We have now completed the SPYRAL study and our site has been closed.

# 14. HYPERTENSION IN PREGNANCY

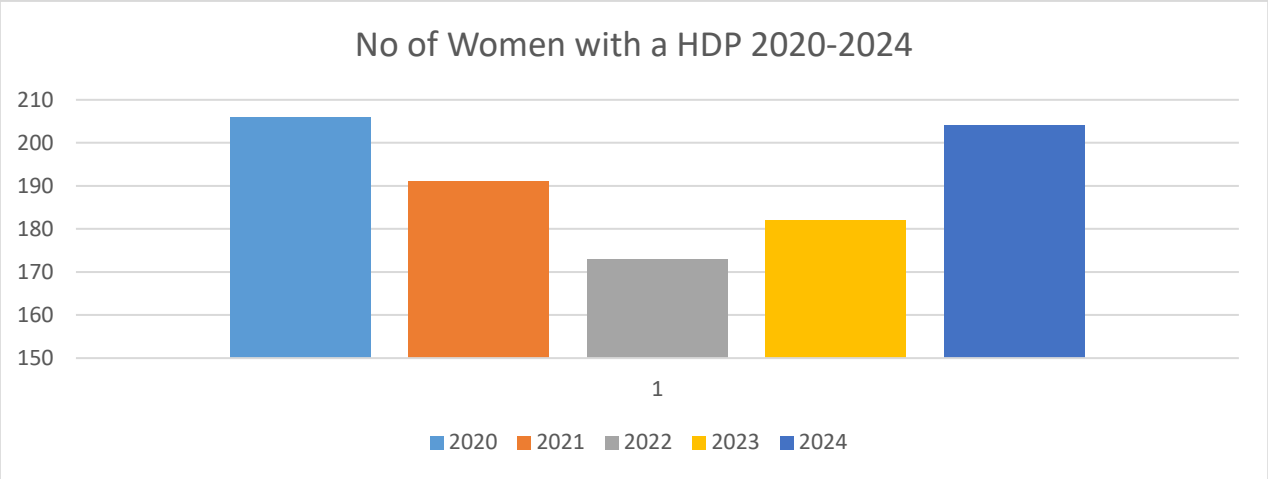
**Dr. Franziska Pettit, Jennifer Beddoe**

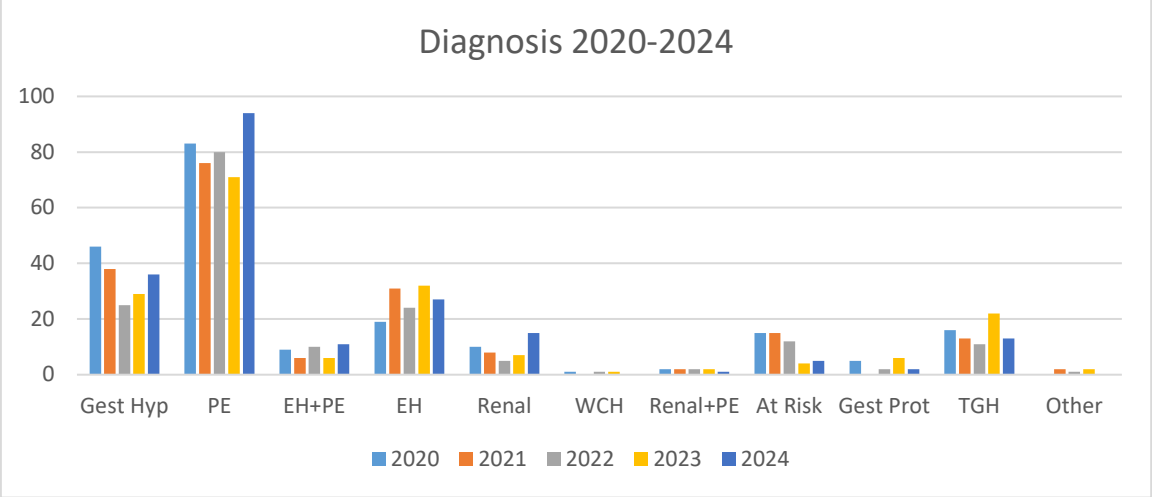
**Aims**

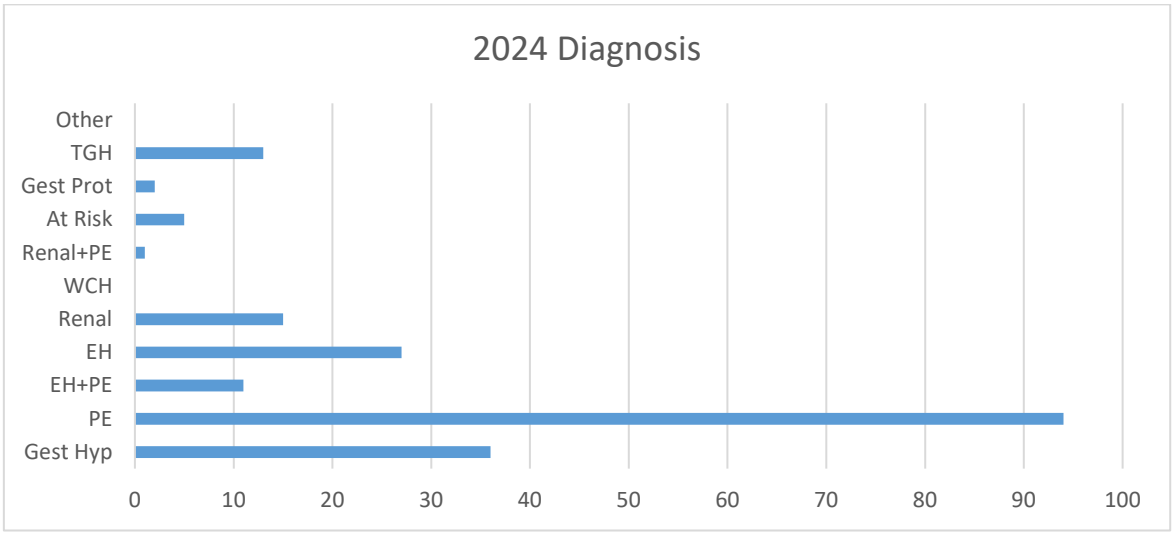
The aim of this report is to review the maternal and fetal outcomes of women presenting with a hypertensive disorder of pregnancy.

**Activity**

- In 2024 there were 2275 births at St George hospital.
- 204 pregnancies (9%) were complicated by a HDP here at St George. In 2022 the Australian Mothers and Babies report the overall rate of hypertension in pregnancy was 5.3%.
- Of the 204 pregnancies with a HDP, 166(81%) were consulted to the renal team, the remaining 38(19%) were managed by the obstetric team.
- 1 woman presented to ED with Eclampsia. Originally booked at Hurstville Private but brought in from home via ambulance
- There were no maternal deaths recorded here at St George.
- There was 1 medical termination at 23/40 due to severe PE
- I x fetal death in utero as a result of HUS (Renal Disease)
- 1 x NND of 1 twin born at 25/40
-




2024 Diagnosis
Other
TGH
Gest Prot
At Risk
Renal+PE
WCH
Renal
EH
EH+PE
PE
Gest Hyp
0
10
20
30
40
50
60
70
80
90
100

# 15. RENAL BIOPSY REVIEW – AUDIT OF COMPLICATIONS

**Dr. Partha Shanmugasundaram**

| | Total | Transplant biopsies |
|---|---|---|
| Number | 131 | 45 |
| Total complications | 4 (3.1%) | 1 (2.2%) |
| Macroscopic haematuria | 3(2.3%) | None |
| Symptomatic Perinephric haematoma | 1(0.8%) | None |
| Transfusion | 1 (0.8%) | None |

Comparison of complication rates over the last 5 years expressed as percentage (number)

| Year<br>N | 2020<br>N=115 | 2021<br>N=94 | 2022<br>N=103 | 2023<br>N=151 | 2024<br>N=131 | Last 5 years<br>N=594 |
|---|---|---|---|---|---|---|
| Total complications | 7.8(9) | 7.4(7) | 5.8(6) | 8.2(12) | 3.1(4) | 6.4(38) |
| Macroscopic Haematuria, %(n) | 4.3(5) | 4.3(4) | 2.9(3) | 5.4(8) | 2.3(3) | 2.9(17) |
| Perinephric Haematoma, %(n) | 4.3(5) | 4.3(4) | 1.9(2) | 2.7(4) | 0.8(1) | 3.0(18) |
| Perinephric bleed – angioebolisation, %(n) | 0.9(1) | 0(0) | 1(1) | 2(3) | 0(0) | 0.8(5) |
| Required blood transfusion | 1.7(2) | 2.1(2) | 2.1(2) | 0.7(1) | 0.8(1) | 1.2(7) |

**Our benchmarks** (Am J Kidney Dis 60(1):62-73. 2012) are:

- Macroscopic hematuria 3.5% - met
- Blood transfusion 1%- met
- Angio-embolisation 0.6%- met

The rate of all complications over the last 5 years was 6.4%. This seems to be stable and in keeping with the rates noted in the international literature and in standard practice. The rates of macroscopic hematuria, and need for blood transfusion or angioembolisation following a renal biopsy in 2024 met the benchmark standard. The renal transplant biopsies were well tolerated, and the complication rates were also well within our set benchmark.

# 16. NUTRITION SERVICES

**By Maria Chan and Maya Young (SGH campus) Please refer to Jessica Dawson's dietitian report for KSC**

Part 1 Referrals and Mode of Referral

*Figure 1 Referrals to dietetics outpatient – clinic and day-stay dialysis (non-ward or inpatient) in 2024.*

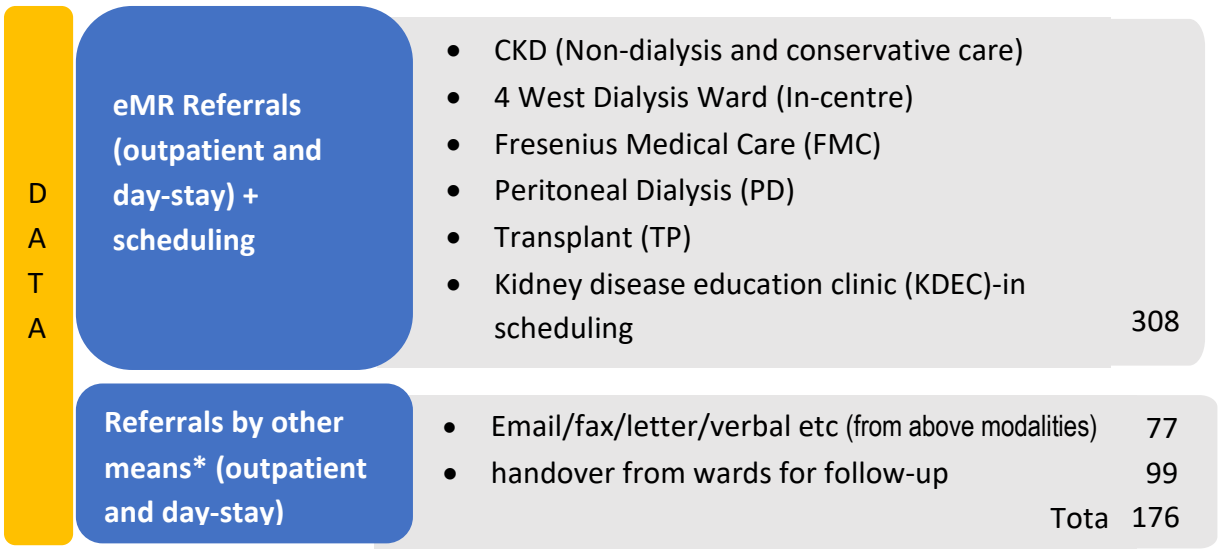



Table 1 Referrals

| Year | Referral (outpatient and day-stay) + KDEC | | Total referral | Handover from inpatient |
|---|---|---|---|---|
| | eMR | by email/fax/letter/verbal/self | | |
| 2021 | 215 | 68 | 283 | 50 |
| 2022 | 286 | 104 | 390 | 75 |
| 2023 | 310 | 77 | 387 | 55 |
| 2024 | 308 | 77 | 385 | 106 |

Remark:

- 308/385 (80.0%) referrals were made via eMR/scheduling. Improved from 73% in 2022, 80% in 2023.
- Recommendations: there is a need to improve referral made by eMR
- Inpatient handover has increased significantly from previous years.

**Part 2 Service type, referrals and dietitian staffing levels estimation for 2024.**

Table 2 New and number of established patients under the care of dietitian

| Year 2024 | | NDD- CKD stage 4-5 (Pre-Dx and conservative care -CC) | RRT | | | | | Total | Current Staffing (FTE) *minimal staffing level required* |
|---|---|---|---|---|---|---|---|---|---|
| Outpatient/day-stay | | | Home HD | In-centre | FMC | PD | TP | | |
| | **New** | ~82 (~67 from KDEC) | 3 | 25* | 2 | 21* | 16 | 149 | 1.0 ~2.8 FTE ranged from 3.0-4.0 in previous years |
| | # **Total** at any time point | ~120 (~90 from KDEC) | 23 | 61 | 68 | 36 | 256 | 564 | |
| **Inpatient** | | | | | | | | n/a | 0.6 |

Abbreviations: NDD-CKD = Non-Dialysis Dependent Chronic Kidney Disease, Pre-Dx = Predialysis, RRT = Renal Replacement Therapy, FTE = Full Time Equivalent, FMC = Fresenius Medical Centre, PD = Peritoneal Dialysis, TP = Transplant, KDEC = Kidney Disease Education Clinic.
*New patients include change of modality and transfer from another units

Remarks:

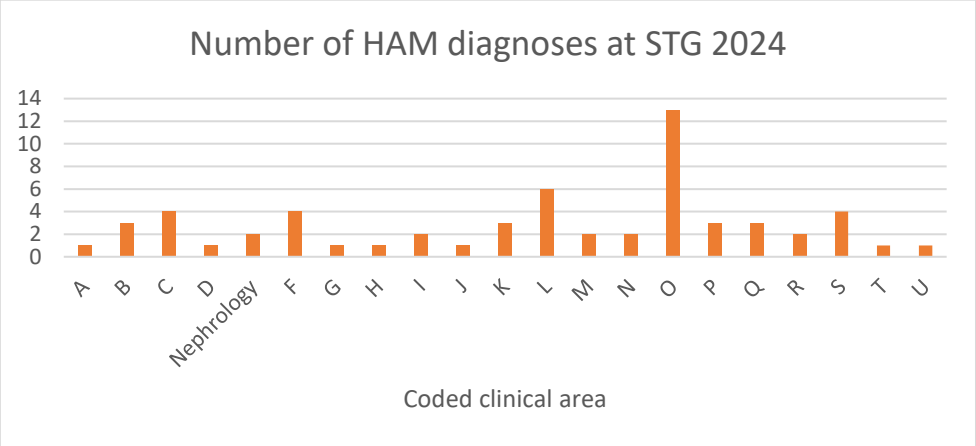
- # Denotes the total number of patients who should be reviewed regularly and for long term follow-up as per best practice guidelines.
- These data suggested minimal contact time, not including re-referrals, post-admission handovers, new issues and complex cases. Patient flow and displacement is ~ 40-50% in the dialysis population. The actual dietetic services requirement is much higher than the above estimation.
- Current dietitian staffing for non-admitted (outpatient) + day stay haemodialysis, dietitian: patient ratio – 1: ~560 (MC) or 1.0 FTE at St George Hospital for the estimated clinical load of 2.8 FTE dietitian OR 1.6 FTE dietitian for 3.4 FTE's total workload according to the Dietitians Association Renal Dietitians Workforce Recommendation: *Workforce recommendations for renal dietitians in Australia and New Zealand, The Australian and New Zealand Renal Dietitians Workforce Planning Group, February, 2018*
- Current staffing level is just adequate for one initial assessment and one review for new patients + one to 2 follow-up session for handover - discharge from inpatient (ward). Provision for regular follow-up for all established patients as per best practice guideline has been challenging.

**Part 3 Key Achievements in QI and research**

1) Inpatient QI projects (M.Y.):

- Checklist for causes of hyperkalaemia in CKD and Dialysis: https://stgrenal.org.au/for-health-professionals/learning-resources/clinical-resources/
- Inpatient QI on malnutrition (M.Y):
  - For patients seen by the Dietitian (N=101) average LOS was comparable for not-malnourished patients (13.9 days, SD 19.7) and malnourished patients (14.8 days, SD 12.3)
  - 53% of patients admitted ≥ 7 days are seen by the Dietitian (N=101/190)
    - Of those 43% were malnourished (N=43/101)
  - 66% of patients admitted for ≥14 days were seen by the Dietitian (N=51/77)
  - 43% of patients were malnourished (22/51)
  - Of those ~9% were classified as Hospital Acquired Malnutrition (HAM), (N=2/22)

*Figure2: Prevalence of Hospital Acquired Malnutrition (HAM)*




2) Aduit of "weight" in outpatient and dialysis units - ongoing to develop protocols to facilitate timely referral to dietitian intervention.

**Research:**

(1) DAMPER study: Dietary Approaches to Manage Progress and End Stage Renal Disease study. Preliminary result has been presented in European Renal Association ERA ASM: #1876 Pre-dialysis nutrition intervention is associated with delayed time to dialysis and survival after initiation of dialysis. https://academic.oup.com/ndt/article/39/Supplement_1/gfae069-0745-1876/7677997 and SGH-TSH medical symposium. Currently is in the process of manuscript preparation

(2) Nutrition research student from UOW: Food preferences and food habits of patients with Chronic Kidney Disease to examine how uraemia affecting taste and food preference. It showed the specific relationships with taste / food preferences and CKD

**Part 4 work in Progress and Future Direction**

**Work in Progress**

- "Weight" audit and protocol development for timely dietitian referrals
- To develop workplace instruction for weight control using diet, and/or Very Low-Calorie Diet (VLCD), and/or medications use to ensure safe and effective practice

**Future Directions**

- To further develop and evaluate structured nutritional care incorporating precision medicine and eHealth.

# 17. THE STGH RENAL NET ZERO HUB

**Dr. Brendan Smyth, Dr. Franziska Pettit, Dr Alexandra Gallagher, Helen Veros**

In a competitive process across NSW Health our department was successful in securing 3-year grant to develop processes that are scalable and innovative to reduce the CO2 footprint of renal services. The training has included: Carbon footprint analysis workshop, implementing change course and “Hatchery programme” to allow upskilling of A.G and H.V.

An initial audit was conducted: consumables in dialysis completed Feb/March 2025-identified key areas for high CO2 emissions.

Planned Projects:

- Centralised acid delivery for 4W +/- TSH
- Reusable cups in PTL and 4W
- Removal of top sheets for CPR compatible dialysis chairs (↓linen use)
- Streamlined cannulation for AVFs and vascath access (CCLHD to join in on initiative)
- Disposable BP cuff use-invx for accuracy and potentially justified discontinuation of use
- PVC recycling (Funda to champion)
- Continued RO reject water savings
- Planned investigation into Extreme heat exposure attitudes survey

# 18. RENAL GENETICS SERVICE

**Dr. Partha Shanmugasundaram**

With the growing recognition of monogenic causes of kidney disease, accounting up to 30% of adults with chronic kidney disease and the broader availability of genetic testing under Medicare funding, a need for establishing a dedicated Renal Genetics service was conceived. This represented a collaboration between the Department of Renal Medicine and the Department of Clinical Genetics at St George Public Hospital. A joint business plan was developed in early 2024, outlining a pilot model to establish quarterly Renal Genetics Clinics within the Renal Unit at St George Hospital. The inaugural clinic was held in June 2025. The frequency was set at quarterly clinics to start with.

Referrals were primarily received from nephrologists within St George Hospital for patients with known or suspected monogenic kidney disease. Genetic investigations may be initiated by the referring nephrologist or discussed during clinic review depending on clinical suspicion.

Each clinic was staffed by an adult nephrologist, a clinical geneticist, and a genetic counsellor, providing coordinated evaluation and management. Patients were jointly reviewed by the nephrologist and clinical geneticist, with genetic counselling offered either before or after consultations as required.

Three clinics were held in 2024. Six patients were reviewed in the clinics, with one of them in the counsellor stream. In one patient with Fabry disease, the clinic facilitated directed chaperone therapy, based on the specific genetic finding.

In addition to direct patient care, the Renal Genetics Service convenes regular multidisciplinary meetings—either in person or via Microsoft Teams—to discuss referred cases, prioritize appointments, and provide feedback to referring nephrologists. Patients requiring genetic counselling alone are booked for separate consultations with the genetic counsellor.

To support future growth and enhance collaboration, the service has established links with the New South Wales Renal Genetics Committee and initiated discussions to join the national KidGen collaborative network.

The overarching aim of the Renal Genetics Clinic is to deliver accurate diagnosis and management guidance for patients with inherited renal disorders, provide comprehensive genetic counselling including reproductive advice for affected families, and contribute to ongoing research and data collection in the field of genetic kidney disease. The outcomes being measured include (but not limited to) diagnostic yield, time to test results, change in management plan as well satisfaction surveys from clinician and patient perspectives.