



ANNUAL REPORT 2020

**Department of Renal Medicine
St George & Sutherland Hospitals**

Website: stgrenal.org.au



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INTRODUCTION

It is with immense pride that I present the 2020 Annual Report of the Department of Renal Medicine, St George & Sutherland Hospitals. I wish to thank everyone in our Department for their contributions to this report and to the ongoing care of our patients.

The following pages highlight the key findings from our report. In brief, we are meeting most of our targets and exceed several, including our very low peritoneal dialysis and haemodialysis infection rates.

We have demonstrated good patient survival for all dialysis patients. The commissioning of our new satellite dialysis unit in Kogarah, managed by Fresenius Medical Care, has been a success and is now a model for public-private partnerships. Our transplant patient outcomes have improved and are above Australian comparators. This coincides with the appointment of Dr Karen Keung to the SESLHD as Transplant Nephrologist to both POWH and STGH. 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 Renal 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

1. ESKD ACTIVITY OVERVIEW -ANZDATA

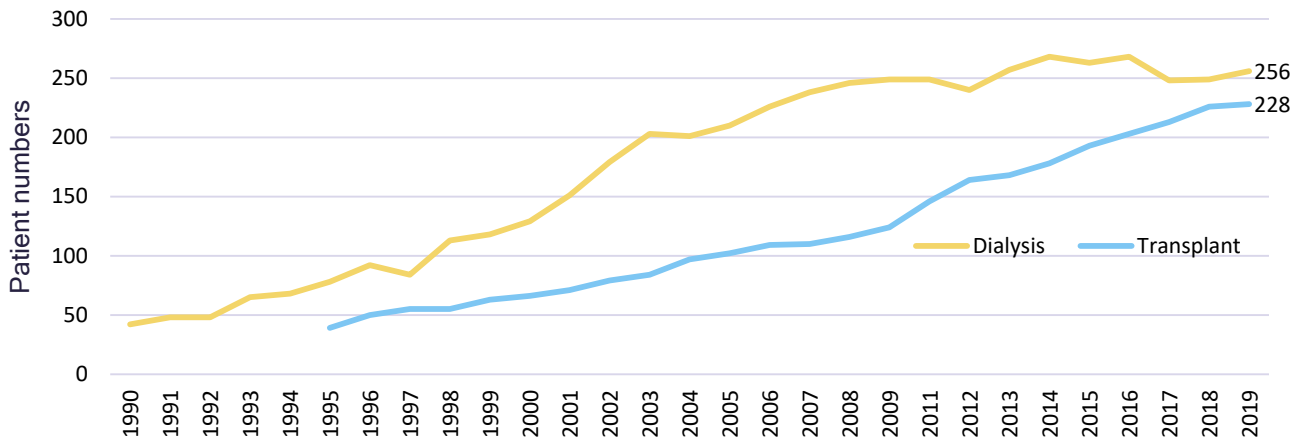


Figure 1. All Dialysis & transplant patients 1990-2019 (ANZDATA 31/12/19)

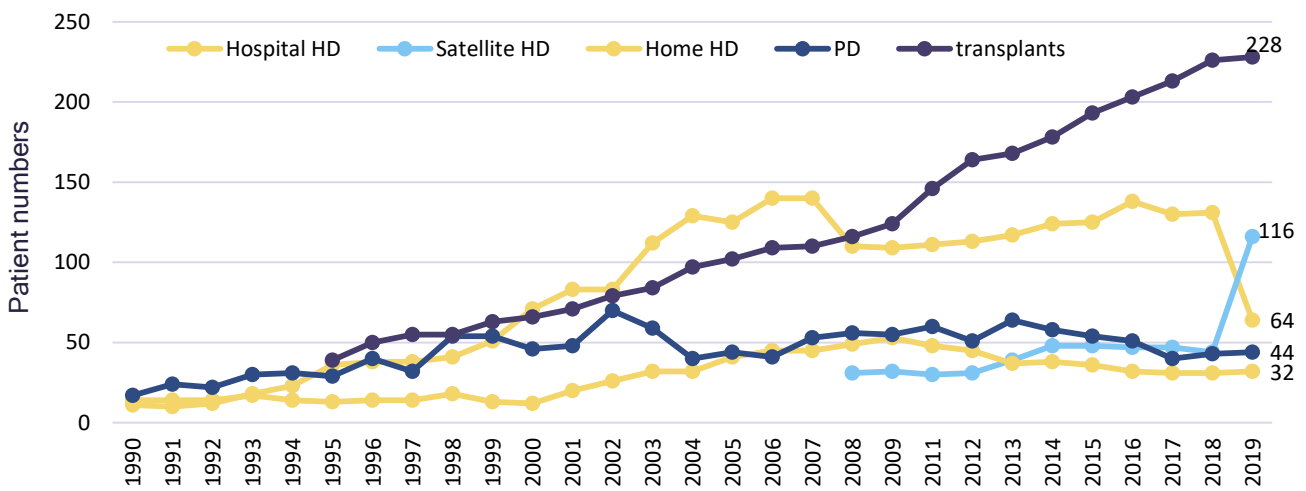


Figure 2. Dialysis & transplant patients 1990-2019 (ANZDATA 31/12/19) NB. Sutherland Satellite unit opened in 2008, St George Satellite unit opened 2019

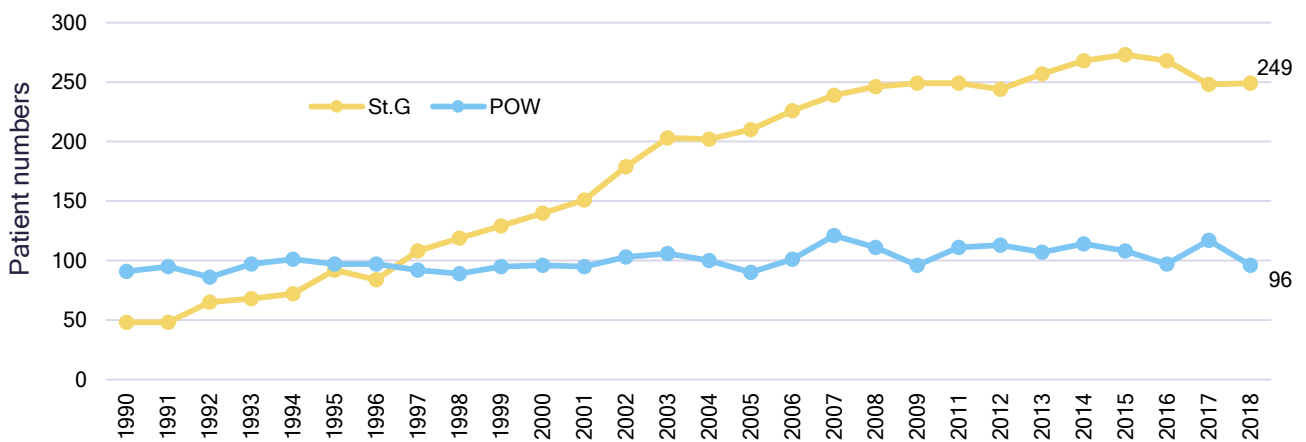


Figure 3. Dialysis patients South East Sydney LHD (ANZDATA 31/12/19)

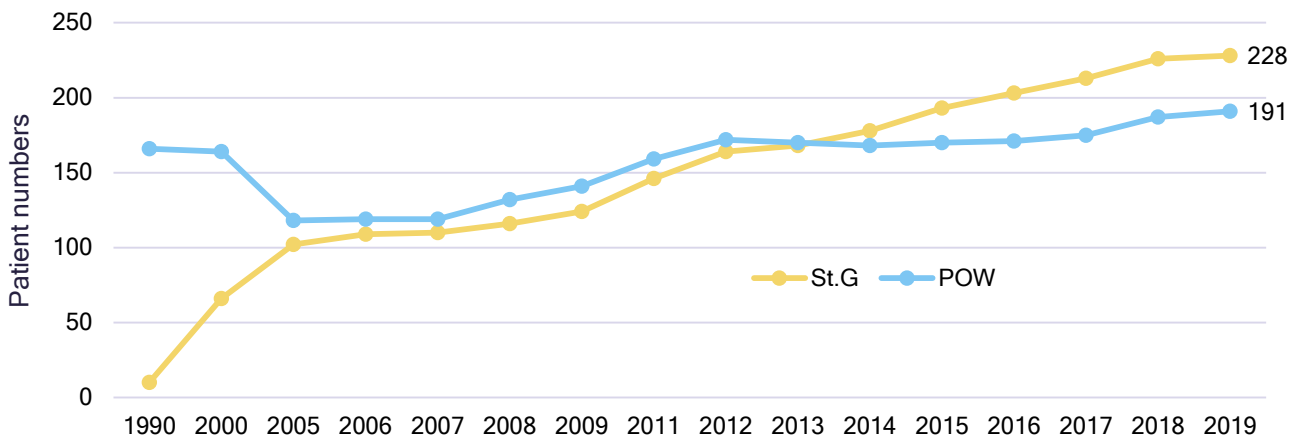


Figure 4. Functioning Transplants South East Sydney LHD (ANZDATA 31/12/19)

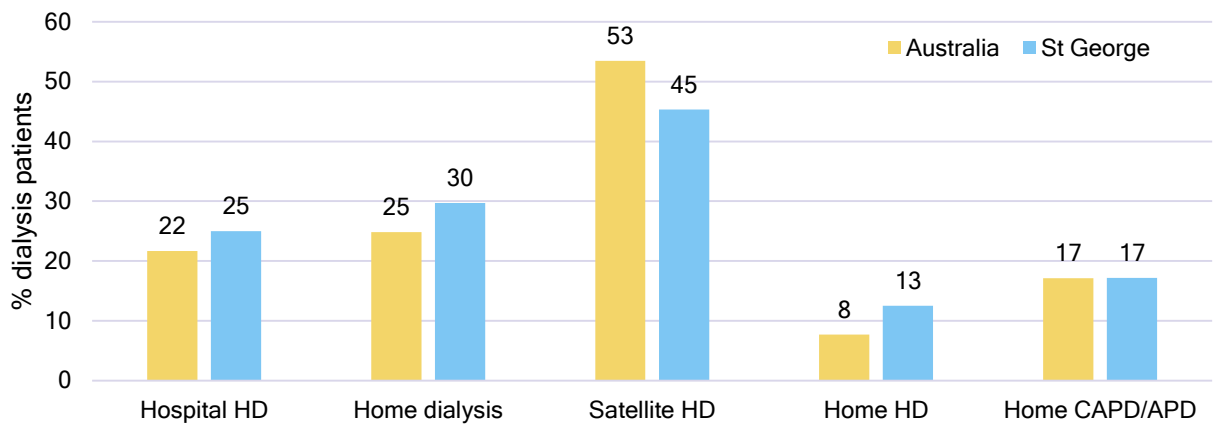


Figure 5. Mode of dialysis Australia & St George 2019 (ANZDATA 31/12/19)

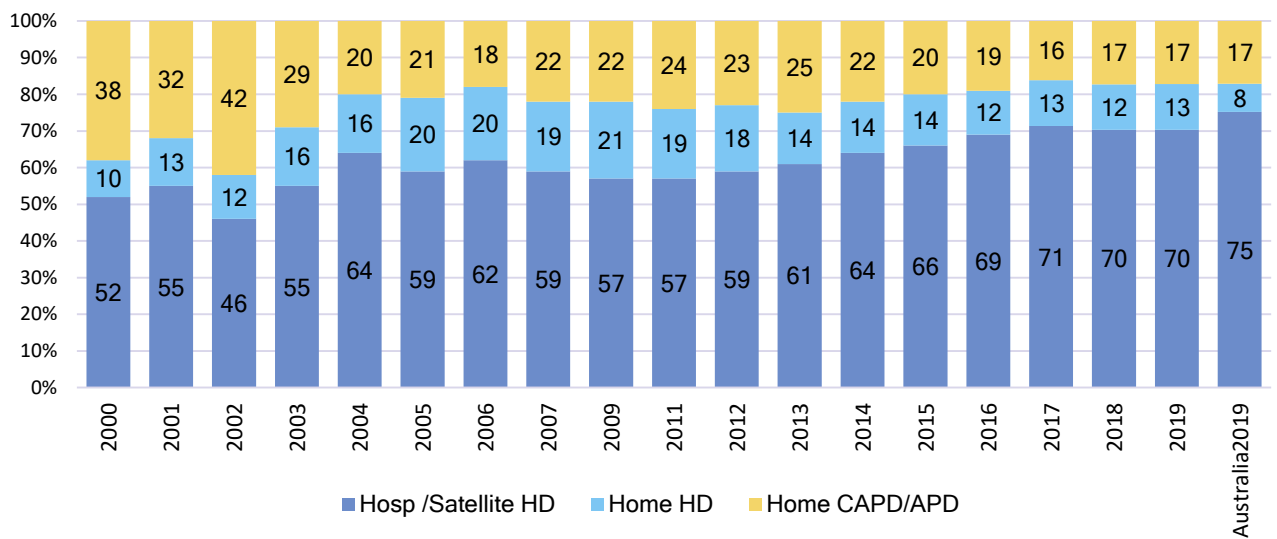


Figure 6. Mode of dialysis Australia & St George 2019 (ANZDATA 31/12/19)

2. CHRONIC KIDNEY DISEASE

Kylie Turner, Saiyini Pirabhahar, Ivor Katz

In 2020, a total of 323 new referrals were received to the renal outpatient department which was 17% higher than the previous year.

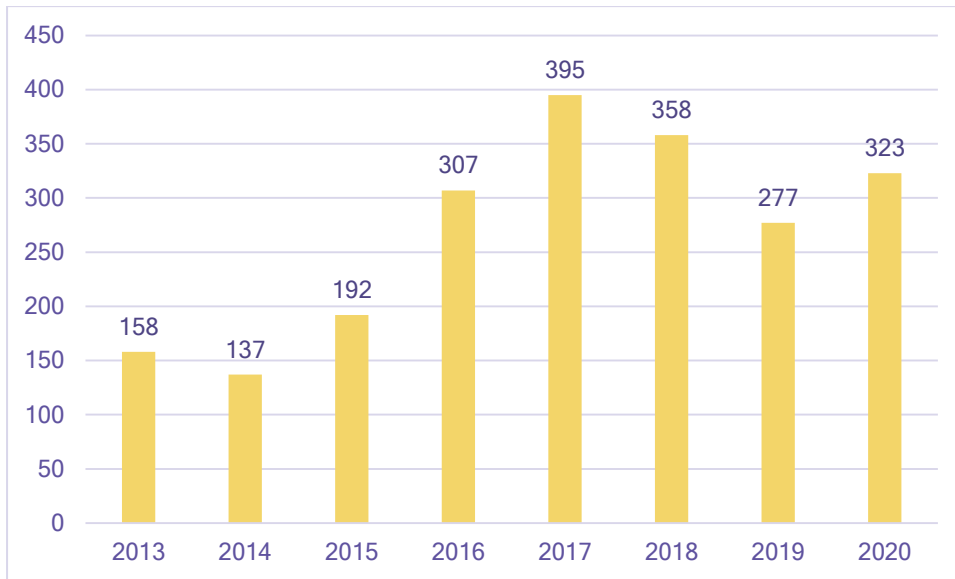


Figure 7. New referrals to General Nephrology Outpatient

3. ADVANCED KIDNEY DISEASE AND PRE-DIALYSIS EDUCATION CLINIC

Kylie Turner, A/Prof Ivor Katz

The Renal Department guideline for referral to the multidisciplinary Pre Dialysis Education Clinic is eGFR ≤ 15 or dialysis predicted in the following year. As of December 31st 2020, there were **129 patients active within the Pre-Dialysis Education clinic with a plan for renal replacement therapy, a 22% increase from the previous year.**

Since April 2002 there have been 1218 people who have attended the clinic. In 2020, 78 new patients attended the Pre-Dialysis Education Clinic compared to 71 new attendees in 2019. There were 51 follow up appointments compared to 52 follow up appointments in 2019.

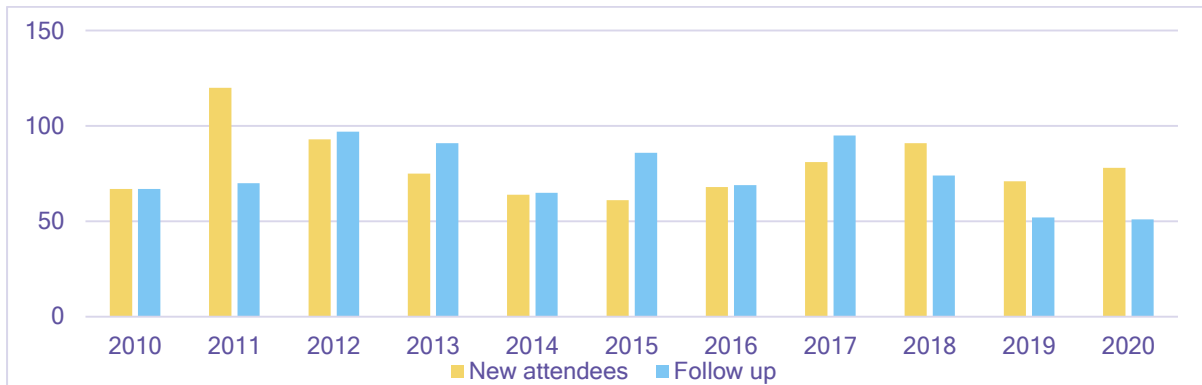


Figure 8. New attendees and follow up numbers for 2010-2020

The age range of new patients seen in 2020 was 20 – 85 years. The average age was 66.1 years. There were 73 patients with eGFR <15 ml/min active in the Pre-Dialysis Education Clinic at the end of 2020, compared with 58 patients at the end of 2019. The graph below shows these patients and their (planned) chosen treatment pathways.

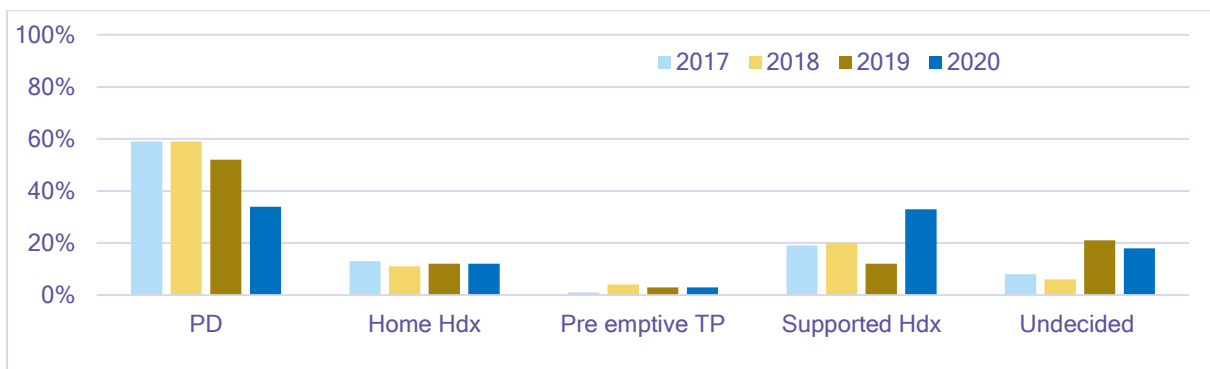


Figure 9. Preferences of patients with eGFR <15 active in Pre-Dialysis Education Clinic and chosen treatment pathways

4. ACCEPTANCE ONTO DIALYSIS

Kylie Turner, A/Prof Ivor Katz

Out of 43 new patients who started dialysis in 2020, 15 (35%) patients commenced peritoneal dialysis, 1 (2%) started home haemodialysis and 27 (63%) started haemodialysis. Patients were analysed according to their first mode of dialysis.

- There was only 1 (2%) late referral and this was below the National average 2019 (19%).
- Mean age at commencement in 2020 was 64 years for peritoneal dialysis and 66 years for haemodialysis. The age of patients starting haemodialysis and peritoneal dialysis was the same as the previous year. Our patients commencing dialysis are older than the national average age which is 61.7 years for HD and 58 years for PD (ANZDATA 2019).

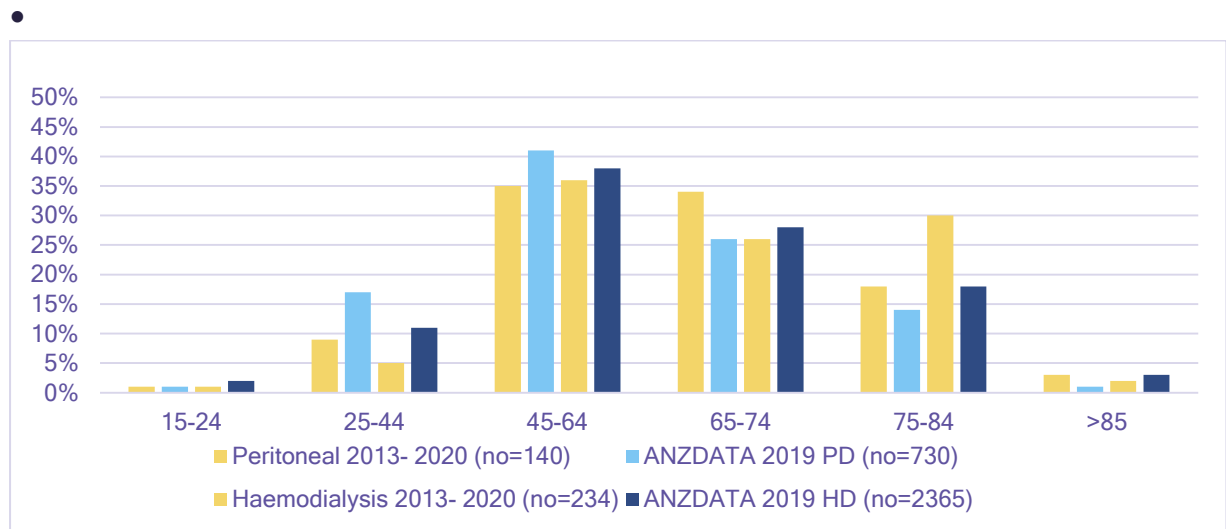


Figure 10. Age Groups of New Patients 2013-2020 compared to ANZDATA 2019

We continue to start more patients than nationally in the 75-84 age groups.

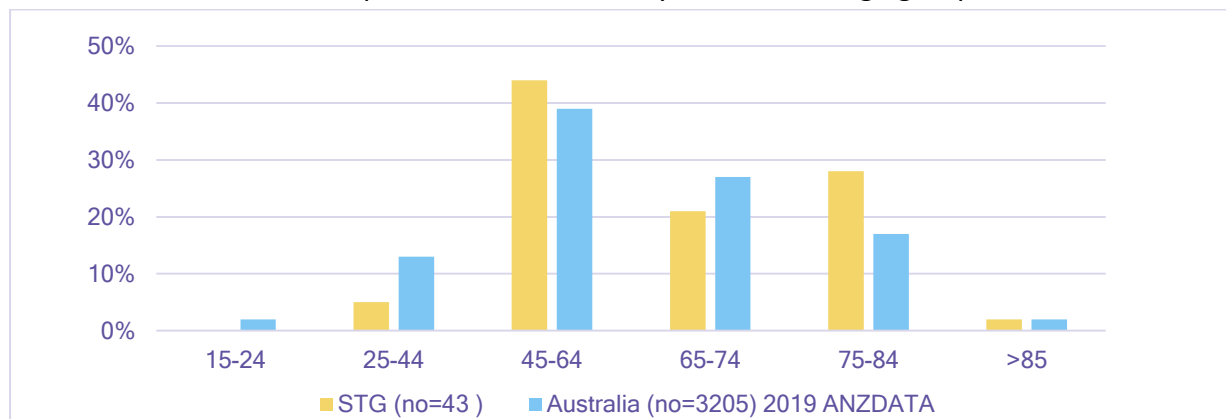


Figure 11. New Patients St George 2020 compared to ANZDATA 2019

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 the vast majority of our patients commencing at an eGFR below 10ml/min.

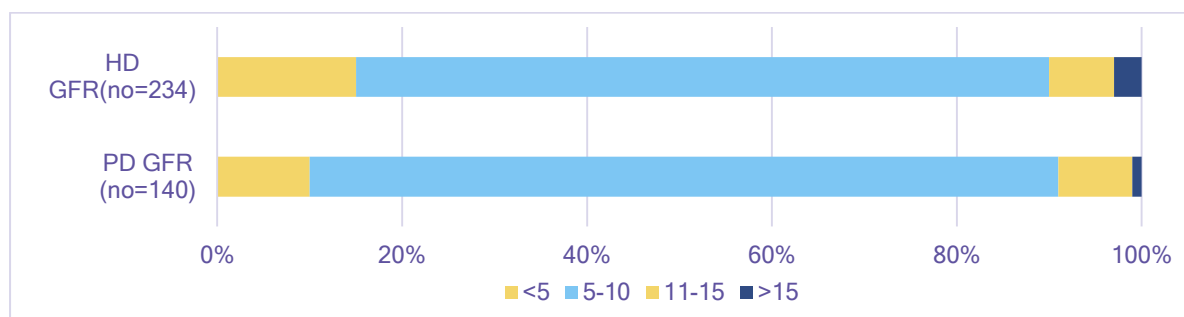


Figure 12. PD and Haemodialysis eGFR at commencement 2013-2020 (% in each range)

Baseline characteristics of new patients- Body mass index

#Body Mass Index (kg/m)	PD 2013 – 2020 (%) N=140	HD 2013 – 2020 (%) N=234
<18.5	2%	3%
18.5-24.9	36%	21%
25-29.9	26%	31%
30-34.9	25%	24%
≥35	11%	21%

Table 1. BMI for St George Hospital new patients

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 2013-2020 (n=234*)	ANZDATA HD 2019 (n=2370)	St George PD 2013-2020 (n=140*)	ANZDATA PD 2019 (n=745)
Average Age	(displayed as age in years)	66	61.7	64	58
Gender	Male	65%	62%	67%	64%
	Female	35%	38%	33%	36%
Late Referral	(< 3 months before first treatment)	15%	22%	9%	9%
Co-morbidities	Smoking (Current and former)	46%	49.4%	44%	47.8%
	Chronic Lung Disease (yes and suspected)	13%	15%	19%	13%
	Cerebrovascular Disease	8%	11%	13%	9%
	Coronary Artery Disease	38%	35%	43%	26%
	Peripheral Vascular Disease	14%	21%	18%	18%
	Diabetes	53%	56%	51%	46%

Table 2. Baseline characteristics compared with ANZDATA- Excludes patients who had previous mode of dialysis

Key Performance Indices for Advanced Kidney Disease and Pre-Dialysis Education Clinic and acceptance onto dialysis

The four benchmarks for predialysis have been established on historical Renal Department data.

1. Timely Referral to Pre Dialysis Education Clinic – 100% of patients referred with eGFR ≤ 20 or KFRE $\geq 20\%$ at 2years and 3mths prior to commencing RRT

In 2020, there were 100 patients referred for pre dialysis education, this was an increase of 3% from 2019. Three of those patients referred in 2020 had commenced renal replacement therapy when referred so they will be excluded from the below numbers. Eighty three percent of patients were referred according to the department referral guidelines. The 17% of patients referred who did not meet the referral criteria were referred due to impending surgery that was predicted to affect their remaining kidney function, recurrent renal malignancy, rapidly declining kidney function predicted to start within 12-18mths of referral.

In 2020, 43 patients commenced RRT 100% of new patients (excluding late referrals and patients who had already commence RRT). Patients who had commenced RRT were referred soon after to receive education.

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

For patients commencing dialysis in 2020, 88% started their planned dialysis choice compared with 94% in 2019. Two patients had originally elected for a conservative pathway but changed their mind during the late stages of their disease. Two patients started on satellite dialysis but have since moved to Home Hdx. The other patient changed his mind and preferred Hdx in a supported unit after starting Hdx acutely whilst in hospital.

3. 60% patients starting RRT have vaccinated immunity

This benchmark means 60% of patients starting RRT had 'vaccinated immunity' defined as 'anti-HBs ≥ 10 International units/L'. Those with natural immunity and chronic infection were excluded in this analysis. There were 60% of patients that commenced dialysis in 2020 with vaccinated immunity. This is a 22% increase from 2019. In 2019 every patient seen in the Pre-Dialysis Education clinic were verbally screened for HepB vaccination. The nephrologist was notified that the patient had been screened via the pre dialysis clinic letter from the Chronic Kidney Disease Clinical Nurse Consultant. Those patients where no serology results were current or available were provided with a pathology form at the Pre-Dialysis Education Clinic to have their status tested. If the Hep B levels were < 10 IU a letter was faxed to the GP requesting they start the Hep B immunization process. We hope to see ongoing improvements so that we can achieve our benchmark in the future and we will continue to alter our practice as required.

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

In 2020, there were 67% of patients consented within 1 month of the patient commencing dialysis. This was an increase from 2019 where there was 61%. By the end of 2020 of the new patients commencing dialysis there were still 33% of patients without a signed consent. Patients attending the Pre dialysis Education Clinic in 2020 received the consent for dialysis form and an information handout regarding dialysis and non-dialysis treatments within the St George Hospital Renal Department. At their next nephrologist appointment patients were encouraged to present the documentation for further discussion. We hope to see continued improvement with this benchmark in 2021.

Summary and Recommendations

The pre-dialysis program continues to function extremely well, capturing the vast majority of patients who commence dialysis, providing good education and allowing the department to plan its dialysis resources accordingly.

All patients continue to be seen prior to commencing RRT with 88% starting their planned modality and the remaining 12% with relevant explanations as to why they started had to commence an unplanned modality.

We had a 3% increase in the numbers of patients referred from 2019 to 2020.

In 2021 we will focus on:

- Continue to ensure patients have a signed consent prior to commencing dialysis
- Yearly review of tracking spreadsheet to ensure active patients currently meet the criteria to remain active in the pre dialysis education clinic

5. CKD VIRTUAL MEDICAL CLINIC (VMC)

Kylie Turner, A/Prof Ivor Katz

St George Hospital Renal Department initiated virtual medical consulting in 2013, where a pilot study was conducted that produced positive results:

- High level of satisfaction within the GP community
- Issues with software integration (time consuming)
- Patients happy with 'virtual' model of care
- Improved time to specialist review.
- No issues of computer literacy

As the outcomes were positive, and at least no different to 'standard' face to face clinic care, it was decided we would continue with this model of care.

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

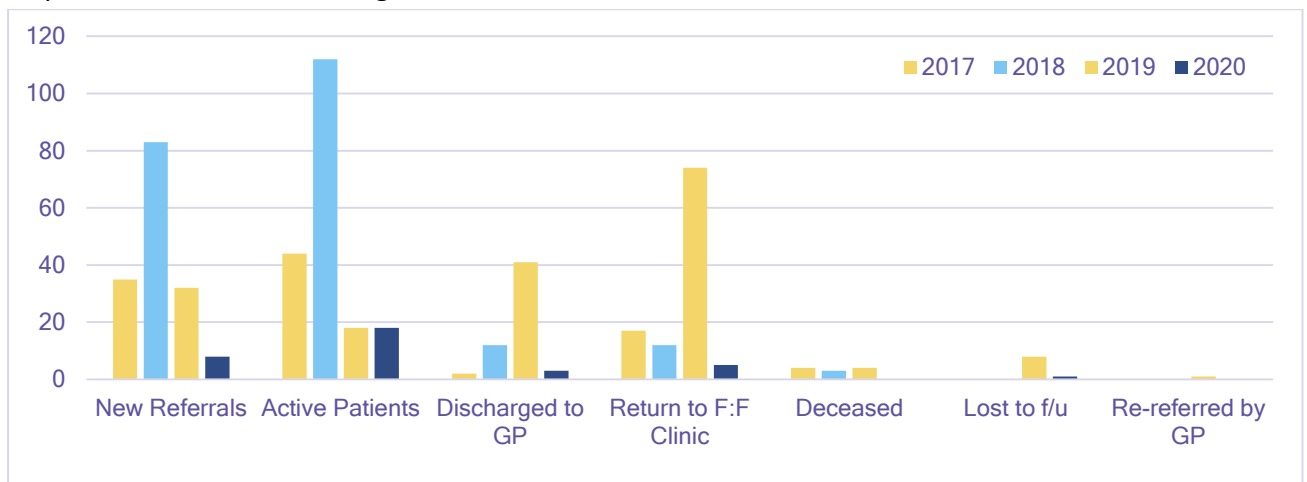


Figure 13. Virtual Medical Clinic 2017-2020

In May 2019 we reviewed all active patients in the VMC and made a decision to streamline the clinic to have active patients who did not require face to face f/u. This saw the current patients having 6 month pathology follow up discharged from the program. The results of this overview reflects in the numbers in the above graph. Two of the new referrals for 2020 were patients who had been previously returned to face to face follow-up.

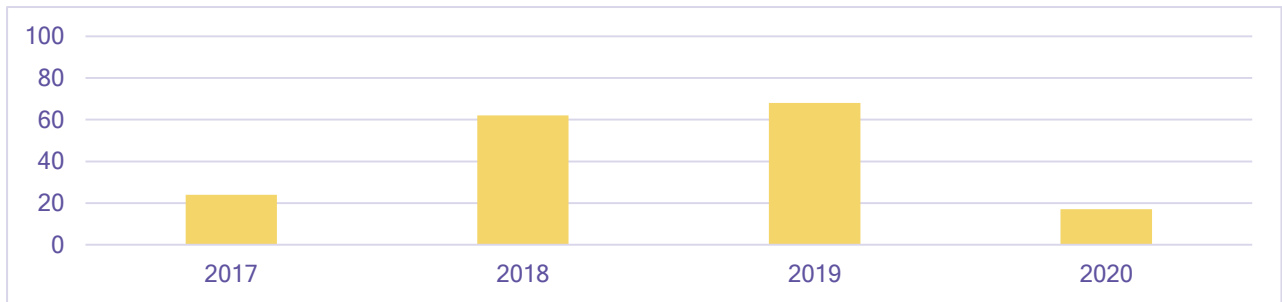


Figure 14. Follow-up appointments 2017-2020

	Active patients 2019 (no=16)	Active patients 2020 (no=18)
Age (Average)	74yrs	77yrs
Female	31%	50%
Male	69%	50%
eGFR (average)	45mL/min/1.73m ²	45mL/min/1.73m ²
ACR (average)	8.4mg/mmol	14.7mg/mmol

Table 3. Active VMC patients as at 31st Dec 2020

KPIs for Virtual Medical Clinic (VMC)

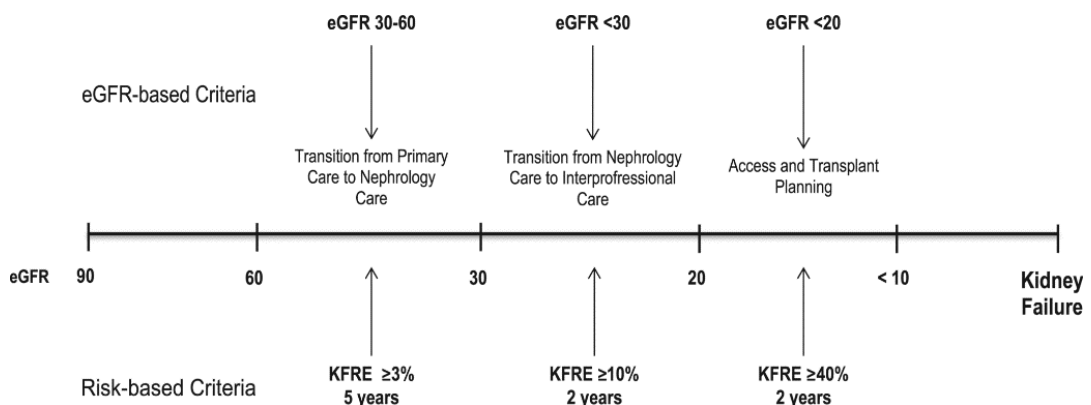
Two benchmarks for the virtual medical clinic have been established

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

In 2020 out of the 8 patients who were referred to the VMC 100% met the clinic criteria of a KFRE 5yr risk of less than 3% this is an increase of 15% since 2019. Out of those 8 patients all were referred with an ACR result which is an improvement from 2019 and all had an eGFR on referral.

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

- a. Evaluate a risk-based versus eGFR-based approach to clinical decision-making in patients with CKD.



Summary and Recommendations

- Yearly review of tracking spreadsheet to ensure active patients currently meet the criteria to remain active in the virtual medical clinic
- Continue to ensure patients are having ACR collected and provided at the time of referral to the VMC.
- Increase the uptake of patients being referred to the program by promoting further in the SGH renal department

6. RENAL VASCULAR ACCESS

Yanella Martinez-Smith, Jayson Catiwa

Native arteriovenous fistula (AVF) remains to be the vascular access-of-choice for haemodialysis due to prolonged patency, minimum risk of infection and maintenance (1).

The Renal Vascular Access Clinical Nurse Consultants (VA CNC) aim to monitor all fistulae from creation until the commencement of dialysis to ensure maturity; perform fistula monitoring and surveillance prior to and after dialysis has commenced; and ensure that a low level of arteriovenous access and catheter-related complications are maintained.

Data is benchmarked against ANZDATA 43rd Annual Report 2020, KDOQI 2019 and KHA-CARI 2013 guidelines. The key performance measures for vascular access against which we compare are:

- 41% patients commencing haemodialysis with a functioning access (2).
- 83% of prevalent patients dialysing through a native fistula (2).
- <1.5 episodes/1000 catheter days of tunnelled or non-tunnelled catheter infection rate (3).

Incident Haemodialysis patients

Functioning Access at Entry

- The national average for patients having a functioning arteriovenous access at first dialysis was 41% according to the 2020 ANZDATA Report.
- ***In comparison, 65% of all new haemodialysis patients at St George Hospital Renal Department had a functioning access at first haemodialysis (Figure 15).***

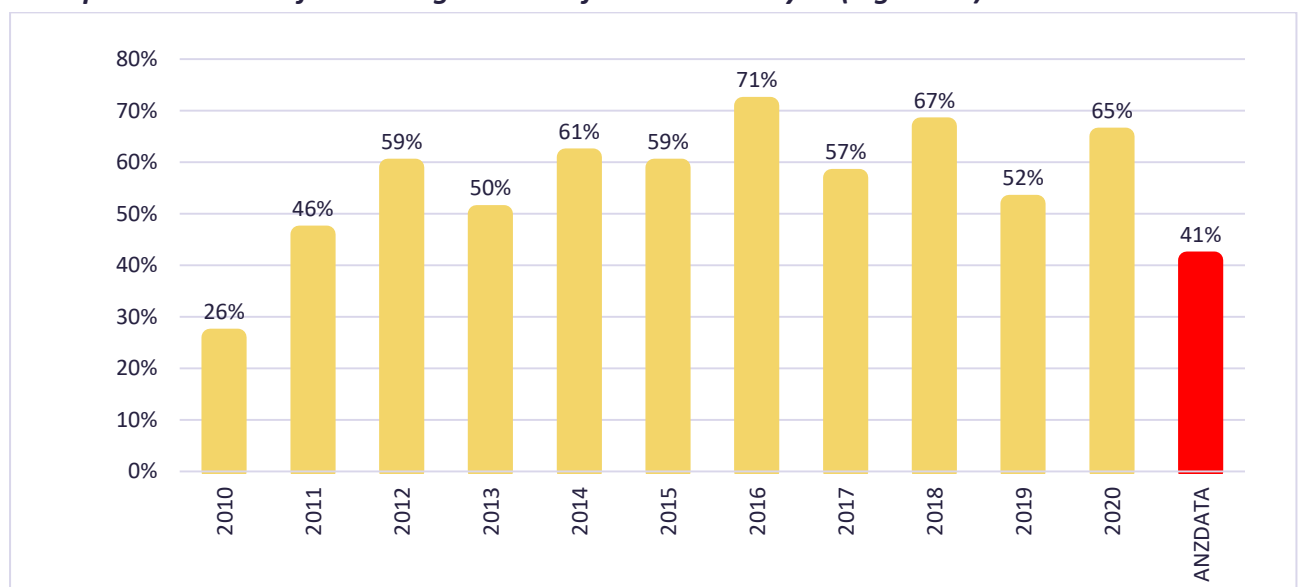
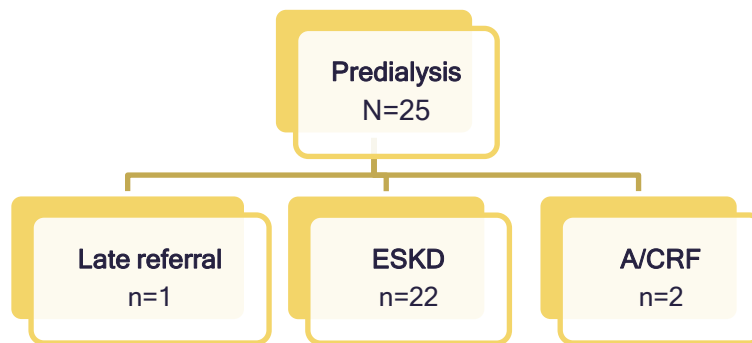
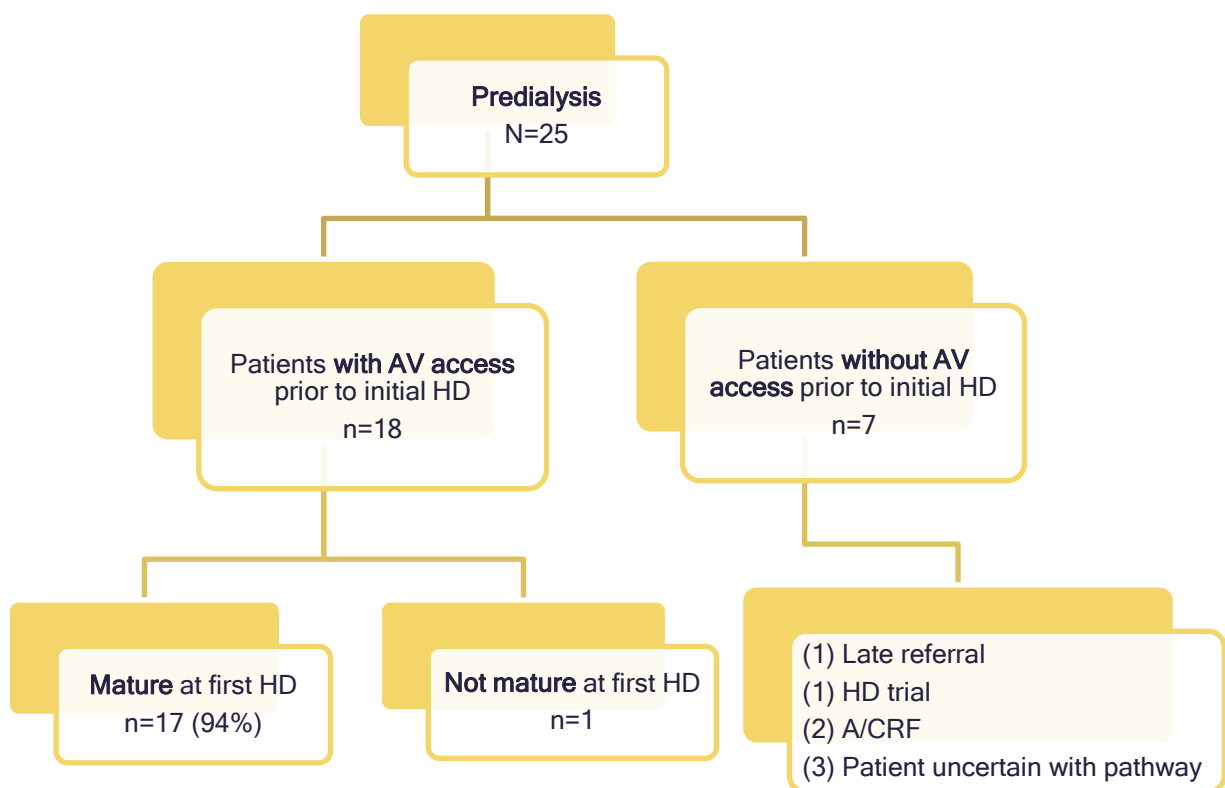


Figure 15. Patients with functioning access at first haemodialysis

Patients New to Haemodialysis



Arteriovenous (AV) Access before Initial Haemodialysis



Comments

- 94% of incident patients (n=17) with AV access created at St George Hospital Renal Department had reached its maturity at their first haemodialysis.
- Late referrals at St George Hospital Renal Department has significantly dropped to 8% in 2020 from 23% in 2019. This remains below 18% of late referrals nationwide according to the 2020 ANZDATA Registry.
- The aim is to have AV access created within 30 days from initial referral to the vascular surgeon.
- At St George Renal Department, the average time from initial referral to vascular access creation was 54 days compared to 48 days in 2019.

- The average time from AV access creation to first cannulation in 2020 is 4.2 months, which is shorter compared to 5.5 months in 2019. This is impacted by increased surveillance and attendance of patients to the nurse-led renal VA clinic.

Vascular Access at First Haemodialysis

- In the 2020 ANZDATA Report, 40% of patients commenced with a native arteriovenous fistula (AVF) and 1% with an arteriovenous graft (AVG) nationwide, equating to 41%. In contrast, more than half of incident patients across Australia and New Zealand start haemodialysis treatment with central venous catheters (tunnelled CVC, 47%; non-tunnelled 10%) (Figure 16).
- In comparison, 64% of new patients commencing haemodialysis at St George Hospital Renal Department were utilising native AVF, which exceeds the 2020 ANZDATA benchmark.
- 32% of the incident patients at St George Renal Department commenced initial haemodialysis via tunnelled CVC, mainly due to transition from peritoneal dialysis without backup AV access and patients who were uncertain with the renal replacement therapy pathway. The numbers remain below the national benchmark of 42% (2).

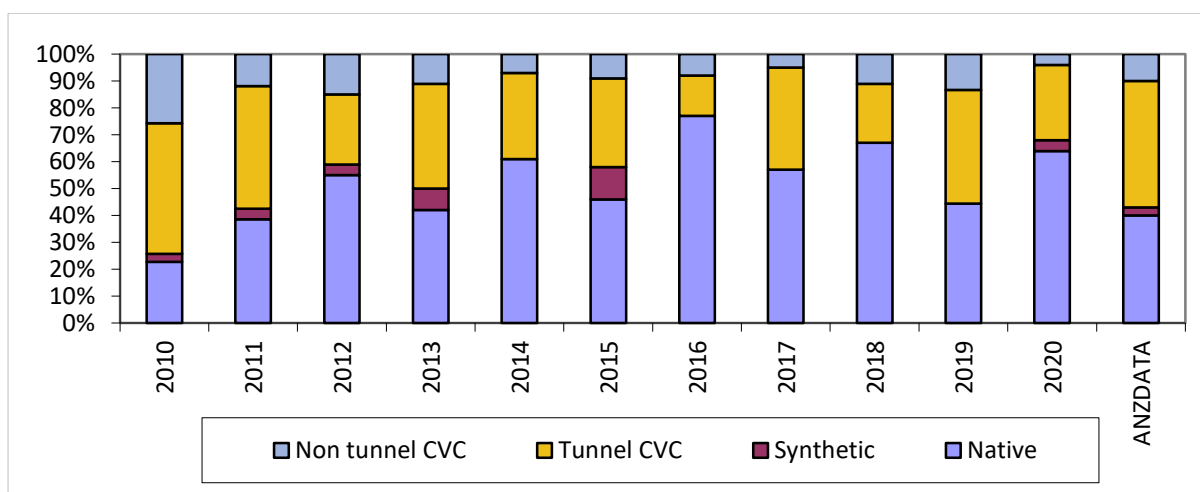


Figure 16. Vascular Access at First Haemodialysis

Prevalent Haemodialysis Patients

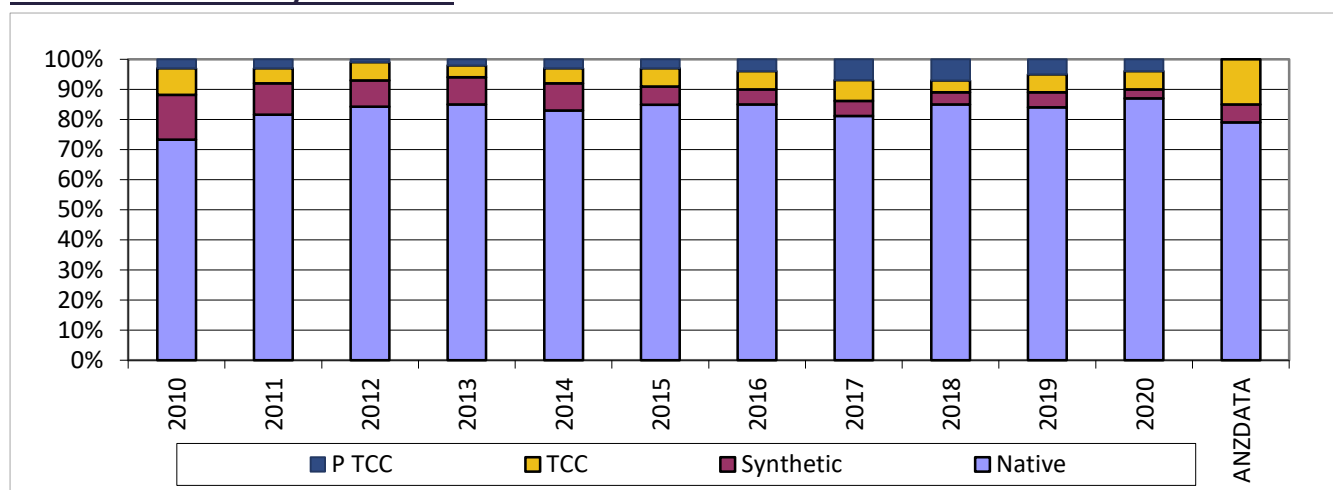


Figure 17. Prevalent Haemodialysis patients

Comments

- There were 214 prevalent patients on haemodialysis at St George Renal Department as of 31st December 2020.
- 90% of St George Hospital Renal Department patients were using AVF/AVG for haemodialysis, which exceeds both the 2020 ANZDATA benchmark of 83%.
- 4% of patients at St George Hospital Renal Department were using a permanent catheter, which is lower than the previous year and has met the 2006 KDOQI benchmark of <10%.

AV Access complications and survival

AV Access Infection Rates

- There was only 1 episode of blood stream infection (BSI) for the native access and nil recorded for the grafts in St George Hospital Renal Department (Table 4). This data does not include home haemodialysis patients.

	Blood stream infection (BSI) range for AVF	Blood stream infection (BSI) range for AVG/SVG
2020	1 BSI (0.7 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2019	2 BSI (0-0.69 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2018	0 BSI (0 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2017	3 BSI (0-0.27 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2016	1 BSI (0-0.08 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2015	2 BSI (0-0.15 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2014	0 BSI (0 BSI/100 pt months)	0 BSI (0 BSI/100 pt months)
2013	1 BSI (0-0.15 BSI/100 pt months)	2 BSI (0-2.3 BSI/100 pt months)
2012	1 BSI (0-0.07 BSI/100 pt months)	1 BSI (0-0.59/100 pt months)
2011	2 BSI (0-0.53 BSI/100 pt months)	4 BSI (0-4.5 BSI/100 pt months)
2010	2 BSI (0-1.16 BSI/100 pt months)	4 BSI (0-11.76 BSI/100 pt months)

Table 4. AV Access Infection Rates

AV Thrombosis Events

- The average thrombosis events across arteriovenous access types is 1 episode per month due to existing vessel disease, haemodynamic instability, delayed vascular intervention and post-operative complications (Table 5).
- Additional point-of-care surveillance using the Transonic machine for the detection of signs of failing vascular access remains to be an enabler to the department’s low monthly average thrombosis rate.

	AVF	AVG/SVG	Average/month
2020	9 (9pt)	3 (3pt)	1.0
2019	10 (10pt)	5 (3pt)	1.25
2018	7 (7pt)	2 (1pt)	0.75
2017	9 (9pt)	6 (5pt)	1.25
2016	15 (14pt)	3 (3pt)	1.5
2015	20 (17pt)	16 (5pt)	2.5
2014	14 (13pt)	13 (8pt)	2.3
2013	8 (8pt)	12 (7pt)	1.7
2012	9 (9pt)	11 (9pt)	1.7
2011	6 (4pt)	16 (10pt)	1.8
2010	8	21	2.4

Table 5. AV Thrombosis Events

AV Access Survival

- KDOQI (2006) recommends AVF patency > 3.0 years and AVG patency > 2.0 years by life-table analysis.

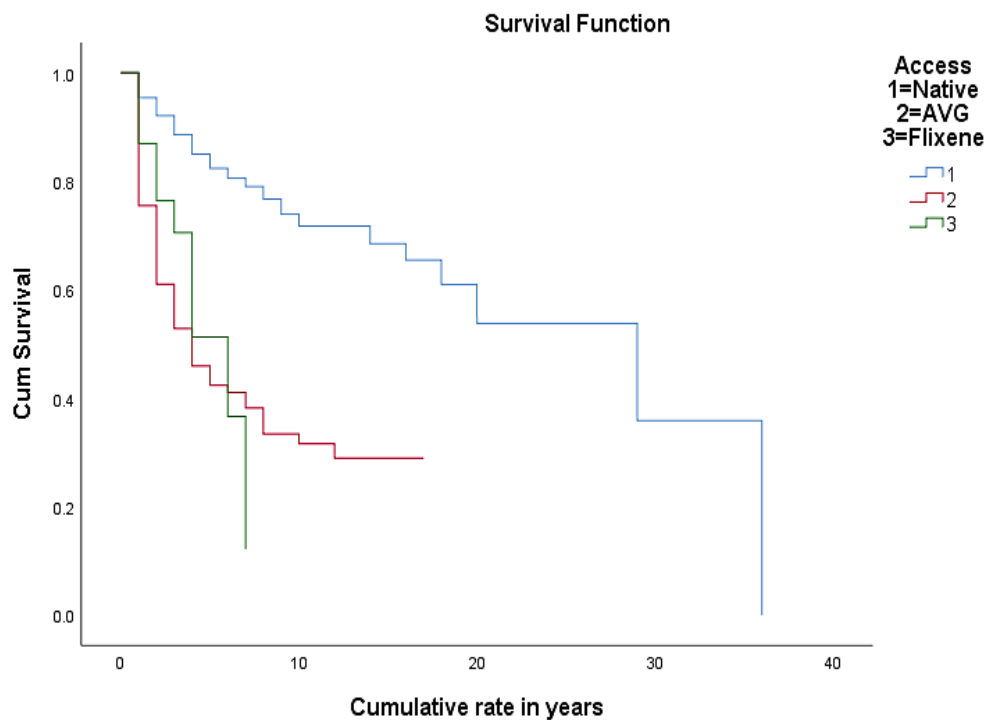


Figure 18. AV Access Survival

Comments

- Cumulative assisted patency is defined as the number of arterial vascular accesses which remain patent regardless of number of interventions during a time period.
- Data includes current and deceased patients since 2004 and excludes primary failure.
- Endpoint was access lost. Data was censored for deaths; a current functioning access; transplantation or transfer to another unit.
- Cumulative proportion surviving at end of the below intervals (Figure 18)
 - AVF at 5 years (81%), at 10 years (72%)
 - AVG at 1 year (61%), 2 years (53%), 3 years (46%)
 - Flexine garfts at 1 year (76%), 3 years (51%)
- Access survival continues to be similar to previous year's results.

Central Venous Catheters (CVC)

CVC Activity Level

- Tunnelled cuffed catheters are used to provide temporary access for both acute and chronic haemodialysis (HD) patients, including those with a primary AVF still to mature (3). In addition, where creation of arteriovenous access is not feasible, HD can commence with the use of CVC (4).

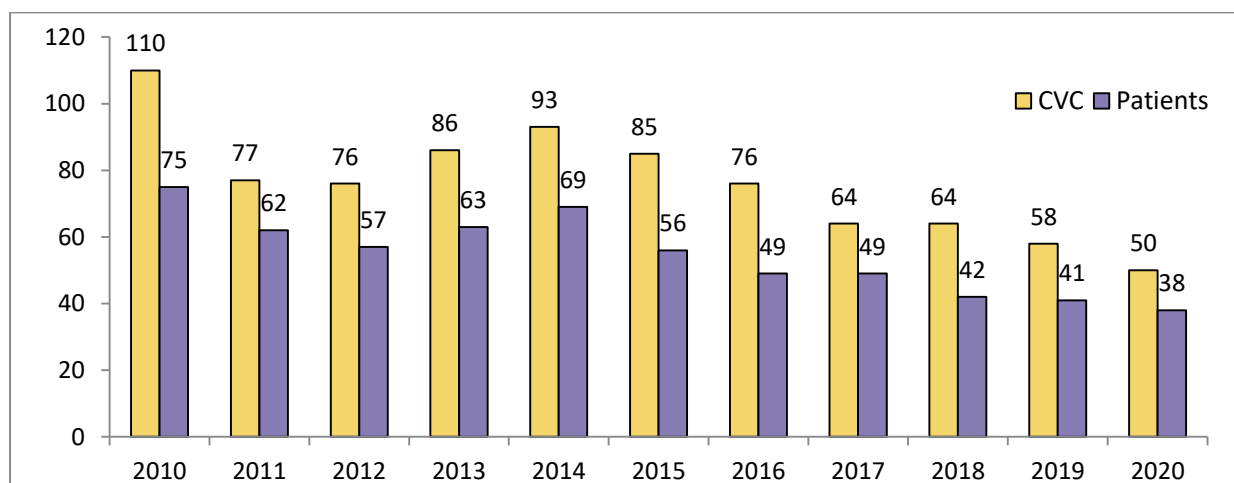


Figure 19. The number of CVC inserted for AKI & CKD

- The number of CVC inserted for AKI & CKD is lower than previous year (Figure 19).
- Total number of days all catheters are in-situ has decreased from 4243 catheter days in 2019 to 4018 catheter days in 2020.
- Average number of days all catheters are in-situ has shortened from 73.5 catheter days in 2019 to 72.5 catheter days in 2020.

Reasons for Catheter Insertion

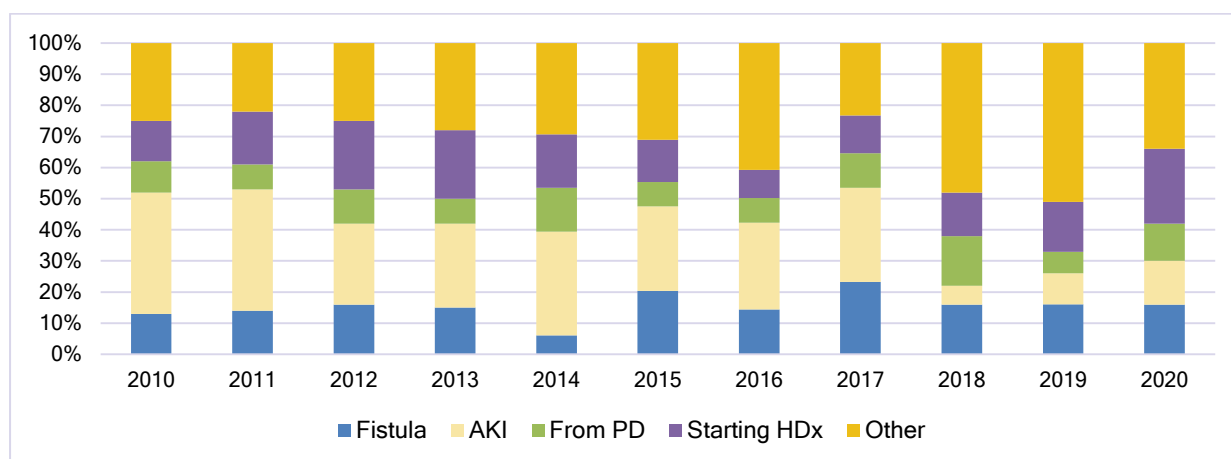


Figure 20. Reasons for Catheter insertion

- Fistula group includes immature, revision or thrombosed access (Figure 20).
- The ICU department continues to manage more patients with AKI which has resulted in steady decrease of catheters inserted for use in dialysis use over the years.
- Other includes replacing a non-tunnelled with a tunnelled catheter, incorrect placement, malfunction, thrombotic and infectious complications.

Catheter Infection Rates

- KDOQI 2006 recommends <1.5 episodes/1000 catheter days of tunnelled or non-tunnelled catheter infection rate (3).
- Current literature suggests exit site catheter infection rate varies from 8.2 to 16.75 episodes/1000 catheter days for non-tunnelled catheters and 0.35 to 8.3 episodes/1000 catheter days for tunnelled catheters (5).

	Catheter related bacteraemia (CRB) rate	Exit site infections (ESI) rate
2020	0% (0 episodes/1000 catheter days)	2% (0.25 episodes/1000 catheter days)
2019	5% (0.44 episodes/1000 catheter days)	5% (0.44 episodes/1000 catheter days)
2018	10% (0.78 episodes/1000 catheter days)	9% (0.67 episodes/1000 catheter days)
2017	7% (0.37 episodes/1000 catheter days)	7% (0.46 episodes/1000 catheter days)
2016	6% (0.46 episodes/1000 catheter days)	4% (0.28 episodes/1000 catheter days)
2015	1% (0.10 episodes/1000 catheter days)	5% (0.41 episodes/1000 catheter days)
2014	2% (0.22 episodes/1000 catheter days)	5% (0.54 episodes/1000 catheter days)
2013	1% (0.15 episodes/1000 catheter days)	2% (0.31 episodes/1000 catheter days)
2012	4% (0.62 episodes/1000 catheter days)	4% (0.62 episodes/1000 catheter days)
2011	1% (0.09 episodes/1000 catheter days)	6% (0.44 episodes/1000 catheter days)
2010	4% (0.69 episodes/1000 catheter days)	5% (0.82 episodes/1000 catheter days)

Table 6. Catheter Infection Rates

- For the 50 catheters inserted in 2020, there were no episodes of catheter-related bacteraemia but 1 episode of exit-site infection.

- The gentamicin/heparin lock continues to be utilised in St George Renal Department as a recommended means to reduce CRB and exit site infection events (3). The KHA-CARI guideline further suggests that antibiotic locks be considered to salvage catheters (6).
- Potential for emergence of antimicrobial resistance remains to be a major concern (6) however random gentamicin levels of <0.5 mg/L indicates toxicity is unlikely. Bi-annual audits of the gentamicin level are being held in the department.

Future Plans

- Nurse-led vascular access clinic continues twice weekly.
- The combined Nephrologist/Vascular Surgeon meeting will continue quarterly.
- The VA professional development group will continue monthly in St George 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 the utilisation of ultrasound for point-of-care access-guided cannulation will be carried out bi-annually.
- Vascular access monitoring through the revised Vascular Access Risk Assessment Tool will be performed on admission, each dialysis (when necessary) and monthly by the nursing staff.
- Vascular access surveillance through the nurse-led clinic and Transonic machine in the dialysis unit will continue for timely detection of the dysfunctional signs of the AV access.

Summary

- Almost all vascular access performance measures are above the national average (eg primary AVF & AVG rates) or within the national and international benchmark. Infectious complications across all access types (AVF, AVG, CVC) remain below the benchmark, and access survival remains excellent.

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7. HAEMODIALYSIS

A/Prof Ivor Katz, Evelyn Graf, Tracey Blow, Elizabeth Hogan, Louise Jordan, Brendan Smyth

Haemodialysis is currently provided at 3 centres: An In-Centre dialysis unit at St George Hospital on the 4 West ward and two satellite dialysis units at Sutherland Hospital and at the Fresenius Medical Care (FMC) unit in Kogarah.

Activity

The St George Hospital 4 West In-centre unit operates a 17-chair haemodialysis service including two isolation rooms. During the COVID-19 pandemic an additional area was prepared, the Patient Assessment Area which had the capacity to isolate 5 patients. 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 In-centre unit provides high level care haemodialysis for inpatients and frail outpatients. On average in 2020, 66 patients were dialysed each month and a total of 9196 treatments were completed.

The St George Satellite Dialysis Clinic outsourced to Fresenius Medical Care (FMC) operates 17 chairs, with capacity to expand to 25 if required. On average in 2020, 71 patients were dialysed each month and a total of 11420 treatments were completed. Between the two St George units (In-Centre and Satellite) there were 20,586 (FMC satellite 11420 and SGH in-centre 9166) treatments completed. Comparing this to 2019 there were 20,592 treatments.

At the FMC satellite unit an additional 2 chairs in the Satellite Clinic are utilised for home dialysis training with eight (8) patients successfully trained in 2020. Three (3) patients were supported by the Medibank Private program and home suitability assessments were transferred from the Sydney Dialysis Centre to the home training service during the COVID-19 pandemic to limit patient movement in the community. Training times varied due to age and comorbidities from as little as 26 days to a maximum of 67 days. Respite dialysis was utilised throughout the year with regular sessions provided for 10 patients. Reasons for respite included, assisting with cannulation (3 patients), support following hospital admission (4 patients), partner unwell (1), dialysis issues in the home (2). Respite stays ranged from two days up to three months.

The FMC satellite unit also runs a nocturnal dialysis shift. We currently have five patients (12%) on the overnight (nocturnal) dialysis program. We have capacity for 12 patients. The Sutherland Hospital operates twelve chairs for low care patients. In 2020, 6604 treatments were performed, and on average, 46 patients dialysed each month.

Activity for haemodialysis

The graph below shows growth patterns from 2012 with year-on-year change as a percentage. This includes haemodialysis for acute kidney injury and chronic kidney disease stage 5/end stage kidney disease (ESKD).

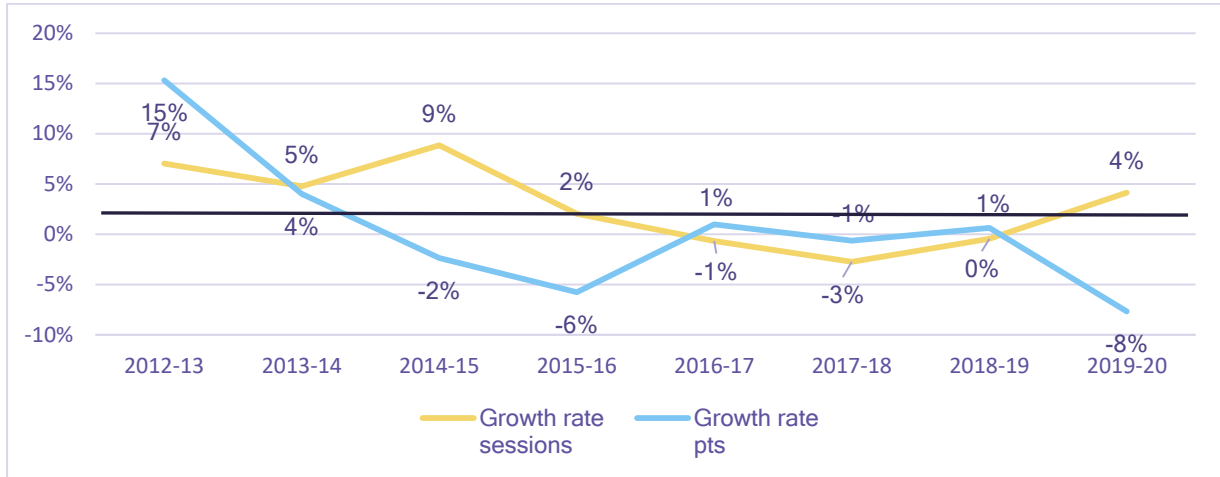


Figure 21. Growth Rates in Haemodialysis at St George (In-centre and Satellite) and Sutherland Dialysis Units

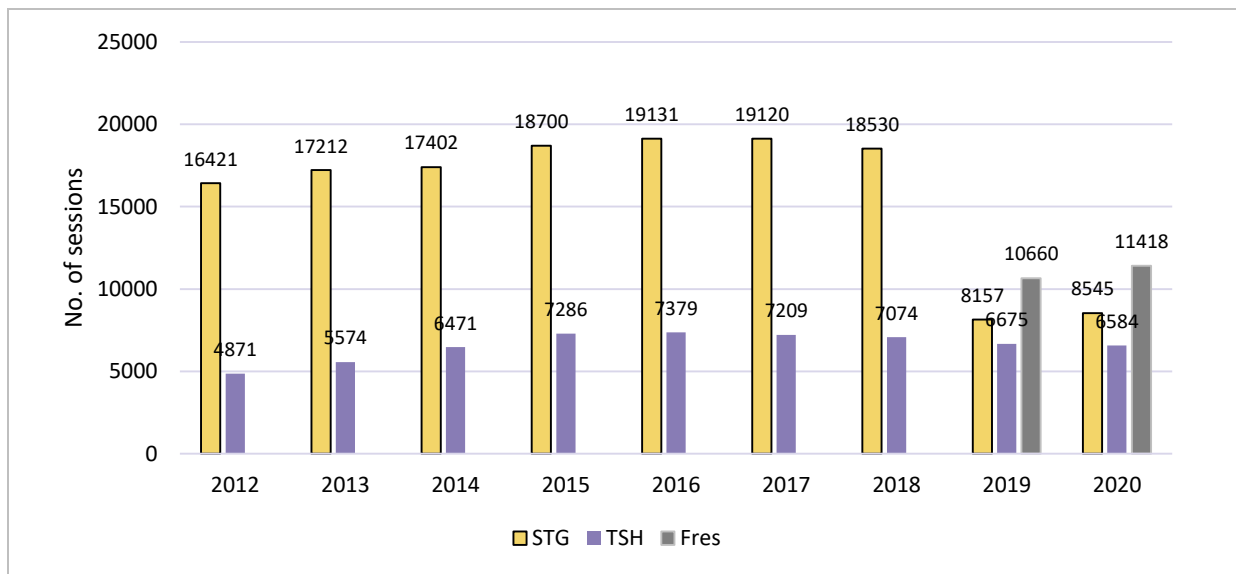


Figure 22. Total sessions per unit

Activity by Dialysis Centre

St George Hospital - In-centre haemodialysis activity to end 2020	2015	2016	2017	2018	2019 4W	2019 FMC	2020 4W
In-centre haemodialysis patients at beginning of year	126	123	135	133	130*		
Remained in 4W / Transferred to FMC (January 2019)					61	69	*61
IN							
1. New Patients	27	29	24	20	19	7	15
2. Transfers from other units	11	2	11	18	8	5	20
3. Transfers from PD	7	10	13	6	7	4	3
4. Failed transplants	2	1	2	3	3	1	0
5. Transfers from Home Hdx/Satellite/incentre	4	5	8	4	5	14	6
6. Acute Kidney Injury*	27	24	22	11	2	1	0
7. Other	1	5		1	1	0	0
Subtotal	79	76	80	63	45	28	44
OUT							
7. Transplants	8	4	6	2	0	5	0
8. Transfers to other units/overseas	2	5	3	6	6	2	17
9. Transfers to Home Hdx	6	3	2		0	6	4
10. Transfers to PD	5	2	5	1	0	0	0
11. Transfers to Satellite/incentre	15	6	14	7	6	8	0
12. Regain Function	18	13	16	8	0	1	0
13. Deaths (medical)	12	11	21	17	14	1	8
14. Deaths (withdrawal)	16	20	15	15	7	1	10
Subtotal	82	64	82	56	33	24	39
NET GAIN/ LOSS	-3	12	-2	-14	+12	+4	+5
In-centre haemodialysis patients at end of year					73	73	66
	123	135	133	119	146		

* The discrepancy in numbers in the last report was adjusted to begin the year 2020 with 61 patients in 4W. Despite extensive review of records, including extracts of dialysis admission data from hospital electronic medical record, it was not possible to determine where the deviation in counts originated between 2018 to 2019. The decision was taken to leave the numbers from 2015 to 2019 untouched, with the numbers in 2020 having been verified. It should be noted that our in centre unit split, resulting in a new satellite unit during this time.

Sutherland satellite HD unit summary report to 2020

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

Fresenius Medical Care satellite HD summary report to 2020	2019	2020
No. patients at the start of the year	69	73
IN		
1. New Patients	7	15
2. Transfers from other units	5	2
3. Transfers from PD	4	3
4. Failed transplants	1	0
5. Permanent transfers from In-centre or TSH Satellite	14	6
6. Acute Kidney Injury*	1	1
7. In-centre backfill		11
8. Respite		
9. Holiday patients	0	
Subtotal	28	
OUT		
7. Transplants	5	
8. Transfers to other units/overseas	2	
9. Transfers to Home Hdx	6	
10. Transfers to PD	0	
11. Transfer to Incentre/Satellite	8	
12. Regain Function	1	
13. Deaths (medical)	1	
14. Deaths (withdrawal)	1	0
15. Others out - Return to Inc home and parent hospital		24
Subtotal	24	53
NET GAIN/ LOSS	4	-2
Haemodialysis patients at end of year	73	71

Home haemodialysis 2019 summary report	2015	2016	2017	2018	2019	2020
Home haemodialysis patients at beginning of year	43	38	38	32	29	34
IN						
1. New Patients	2	6	5		3	0
2. Transfer from PD	2	2	3	0	0	0
3. Transfers from other units	0	0	0	0	0	2
4. Transfer from Satellite	1	0	2		6	7
5. Failed transplants	0	0	2		0	0
6. Transfer from Incentre Hdx	0	2	2	0	0	0
Subtotal	5	10	14		9	9
OUT						
Transplants	7	5	4		2	3
Transfers to other units	1	0	0	0	0	1
Transfers to Incentre Hdx	2	3	0	0	0	1
Transfers to Satellite	0	0	3		1	1
Deaths	0	2	2		2	0
Subtotal	10	10	9		5	6
NET GAIN/ LOSS	-5	0	-5	-3	5	3
Home haemodialysis patients at end of year	38	38	33	29	34	36

Patient survival

The following survival data is provided by ANZDATA which includes all patients ever treated by a dialysis modality (> 3 months) at St George or Sutherland. All patients commencing dialysis after 1 January 2000 are included. Survival time is censored at transplantation or recovery of renal function.

The median survival of 4.71 years (95% CI, 4.01 to 5.9; n=1439) has declined over the years. This may reflect the high comorbidity and ageing dialysis population which exists at St George and Sutherland areas. The mortality rate of 13.0 per 100 patient-years (95% CI, 10.0 to 16; n=4085.6 person-years) is similar to the national data (13.7 per 100-patient years). Similar to national data, there has been no change in dialysis survival for the past 15 years and patients receiving home haemodialysis consistently survive longer. Survival is quite close to transplantation, a positive fact.

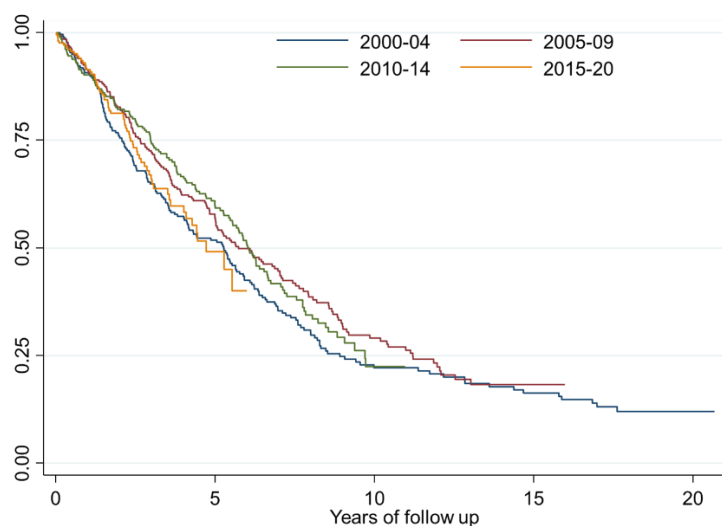


Figure 23. Survival curves (all dialysis patients) by 5-year interval.

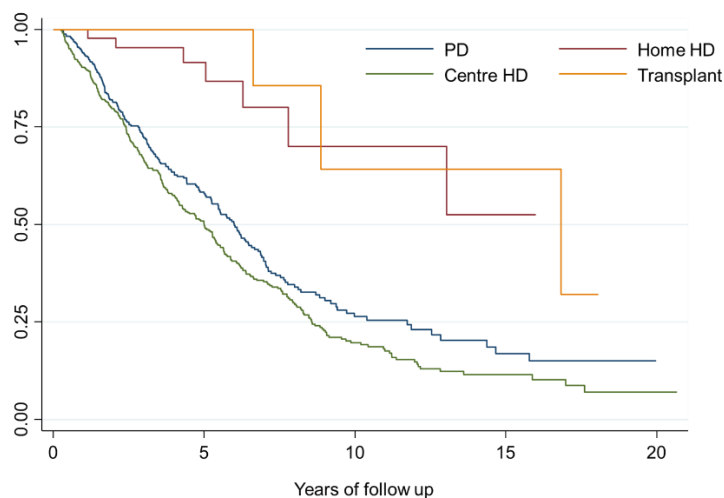


Figure 24. Survival curves by dialysis modality at 90-days

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. For the last year due to COVID 19 pandemic only October adequacy values, biochemical and haematopoietic values were recorded for this report.

Anaemia management

The median haemoglobin was 115g/L (STD 14) and the proportion of patients with haemoglobin between 110 and 129 was 56.7% (Last year it was 46%). At the time of data collection, 74 % of patients were on erythropoietin stimulating agents (ESA), 2% currently had ESA withheld and 8% were not on ESA. Data for the remaining 16% was not known

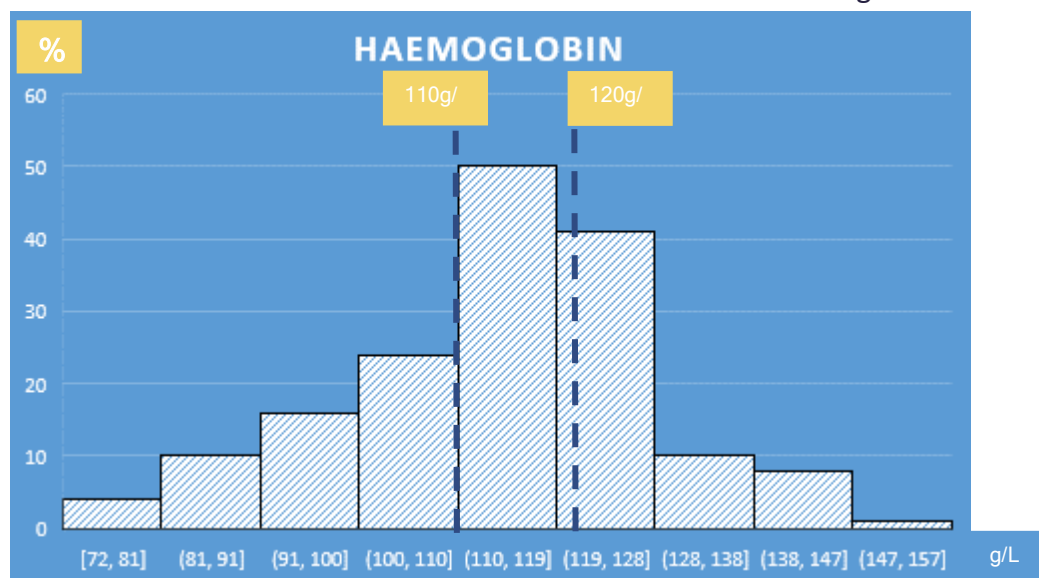


Figure 25. Haemoglobin values in g/L of all dialysis patients (median 115; mean 114; STD 14)

Figure 4.19.1 - % Haemodialysis Patients with Hb 110-129 g/L - Australia 31 December 2018

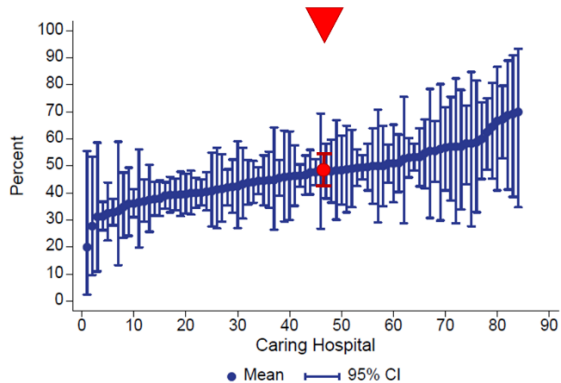


Figure 4.18.1 - Haemoglobin in Haemodialysis Patients - Australia 31 December 2018

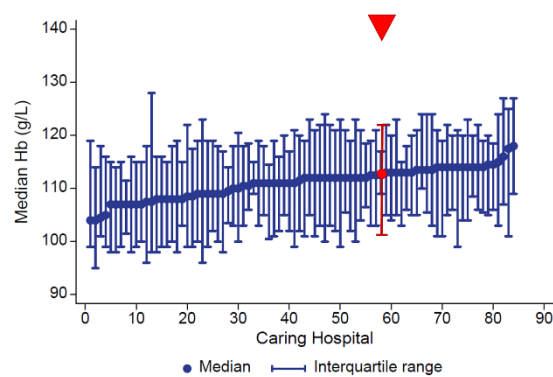


Figure 26. St George/Sutherland (red) and National Anaemia parameters (ANZDATA, 2018 Report)

The mean ferritin value was 342ng/L (STD, 303) and median value was 395ng/L. Forty four percent (44%) of patients had a ferritin between 200 and 500ng/L. The mean transferrin saturation was 24.4% (STD, 11) and 84% (last year it was 67%) had a transferrin saturation between 20 and 50%. Seventy six percent (76%) tests revealed ferritin between 200 and 800, and 61% had a transferrin saturation between 20 and 50%. Nineteen percent (18.9%) of tests revealed a ferritin level <200 and for transferrin saturation below <20%, it was 32.3%.

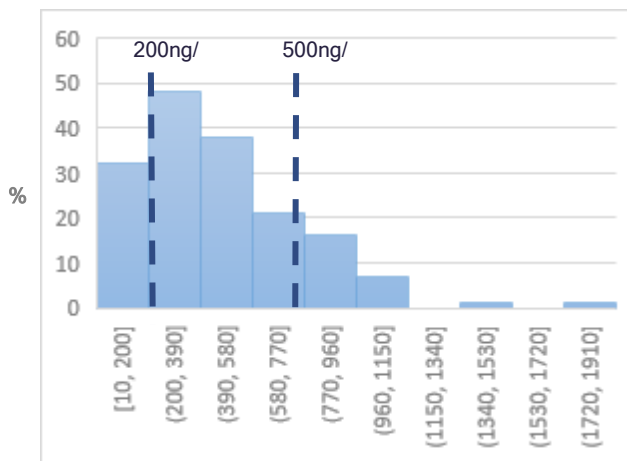


Figure 27. Ferritin values ng/L

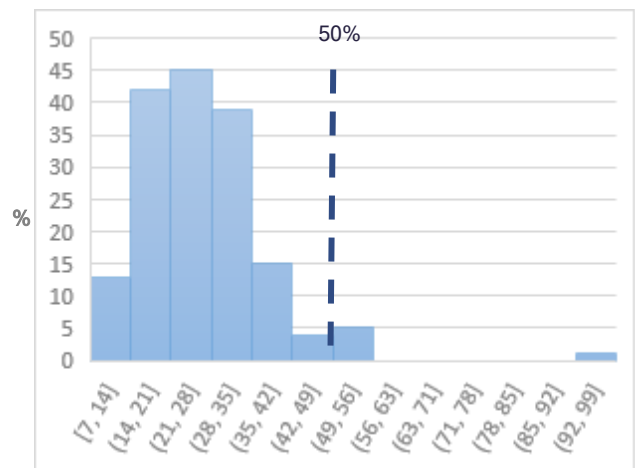


Figure 28. Transferrin Saturation values (%)

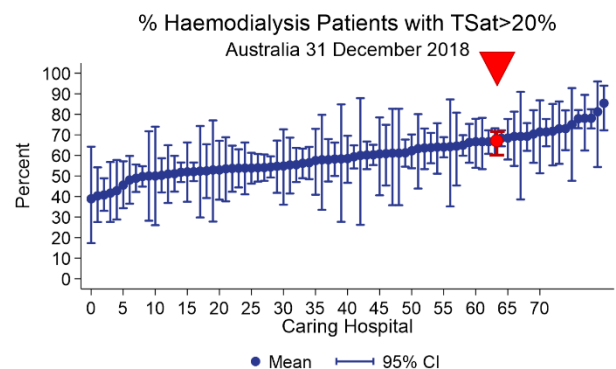
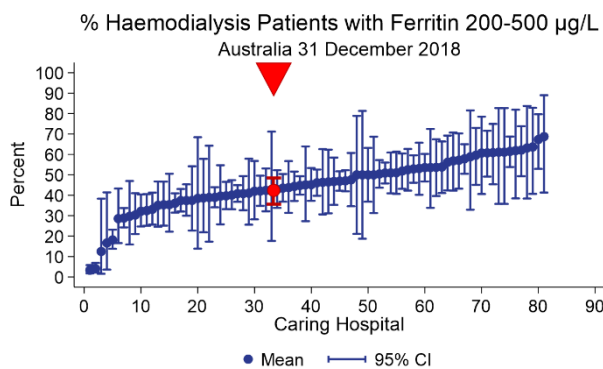


Figure 29. St George/Sutherland (red) and National iron parameters (ANZDATA, 2018 Report)

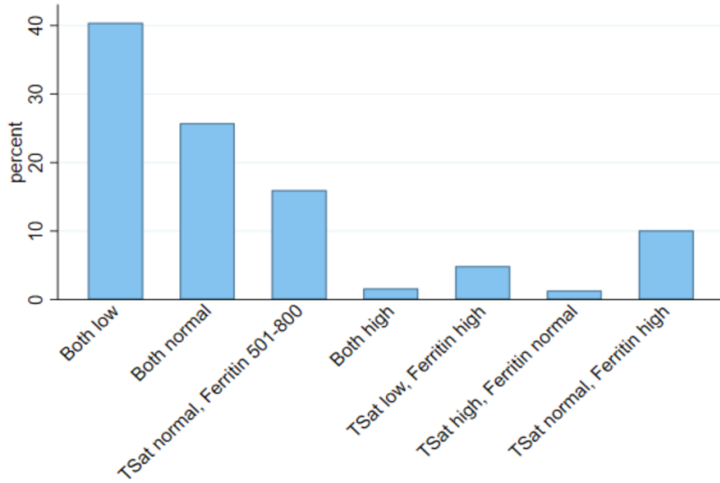


Figure 30. Ferritin and Transferrin saturation patterns.

Calcium, Phosphate and PTH

The mean calcium was 2,31mmol/L (STD 0.18), with 52% (95% CI 60.7 to 73.1) of tests in the target range of 2.1 to 2.4mmol/L. The mean phosphate was 1.62mmol/L (STD 0.56) and 56.0% had phosphate in the range of 0.8 to 1.60mmol/L. The median PTH was 21.6pmol/L (STD 48.6) and 43% of test were in the range of 2 to 9 times the upper limit of normal. There were 11.5% whose PTH was >95pmol/L

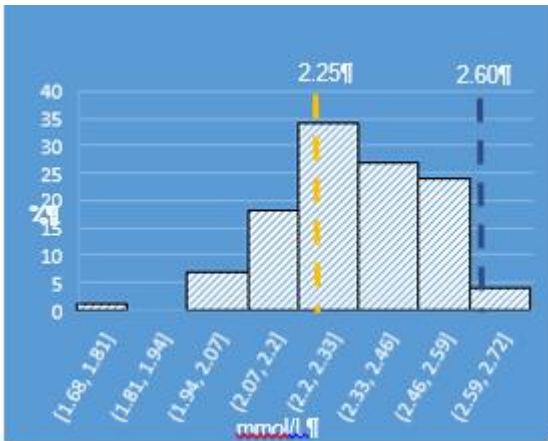


Figure 31. Corrected Calcium values (mmol/L)

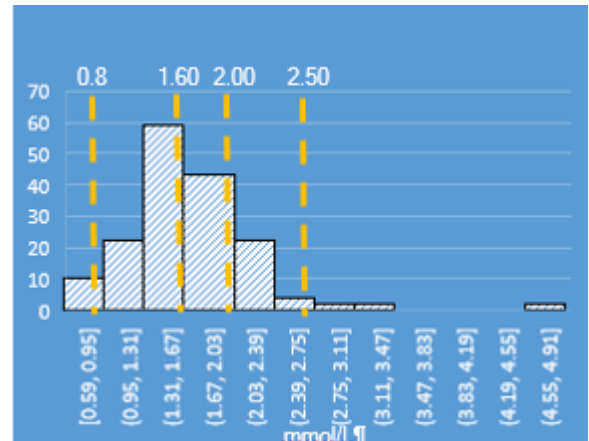


Figure 32. Serum Phosphate values (mmol/L)

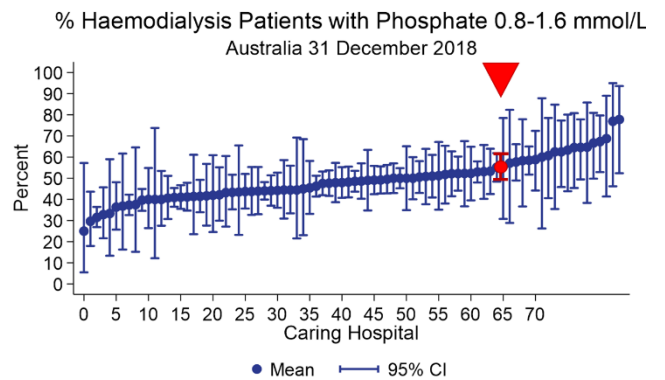
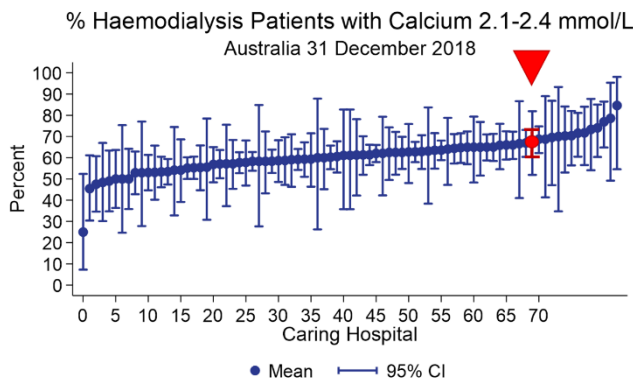


Figure 33. St George/Sutherland (red) and National calcium and phosphate parameters (ANZDATA, 2018 Report)

Dialysis adequacy

The mean urea reduction ratio was 76.9% (STD 5.86) and 85.9% (95% CI 80.2 to 90.2) of tests were 70 or greater. Mean Kt/V was 1.68 (STD 0.76). It excludes 9 nocturnal dialysis patients which are dialysed at our Fresenius Medical Centre, who dialysed on average 6.5 hours overnight and their Kt/V was 1.68 with a large standard deviation (STD 1.85).

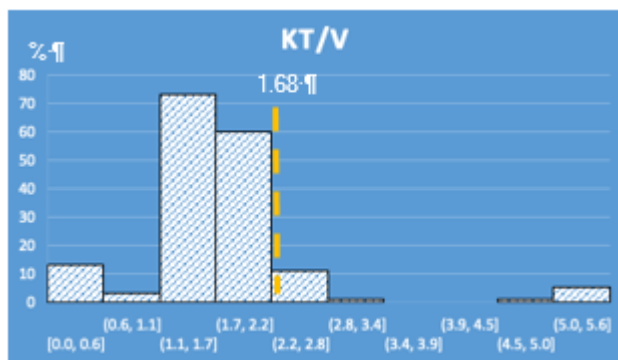


Figure 34. Kt/v measure of adequacy – Mean of 1.68 (see yellow line)

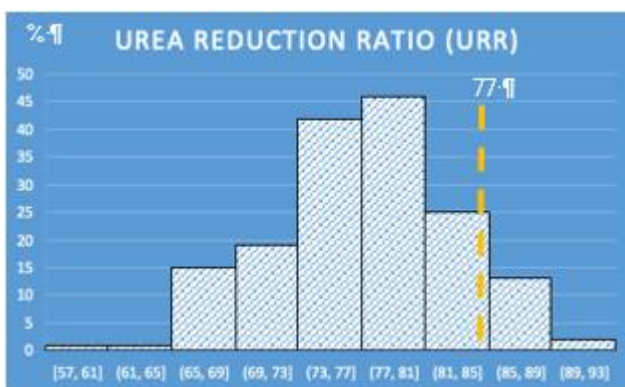


Figure 35. Urea Reduction Rate (URR) – Mean 77%

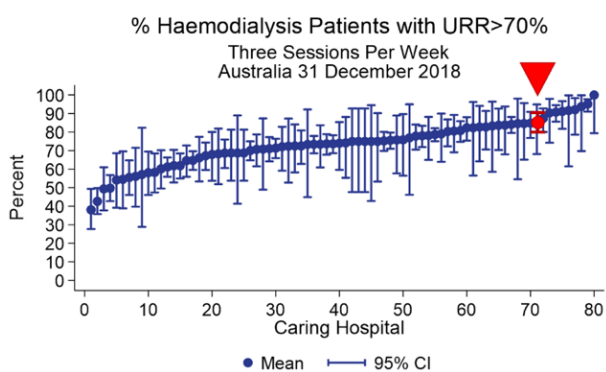


Figure 36. St George/Sutherland (red) and National URR (ANZDATA, 2018 Report)

Dialysis Duration (Hours on dialysis)

Duration (hours)	St George Hospital In-Centre HD (%)	Sutherland Hospital Satellite HD (%)	Fresenius Medical Centre Satellite HD (%)
< 4	3	0	0
4	27	33	22
4.5 – 4.75	38	51	15
5-6	32	16	26
7-7.5	0	-	7
8	0	-	1

Table 7. Dialysis duration per individual dialysis session at St George and Sutherland Hospitals

- 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 100% respectively

Home Haemodialysis 2020

Duration (hours per week)	Home haemo (n)	Frequency of dialysis
12 -14 hrs	4	3 x week = 23
15-17 hrs	18	Alternate days = 12
17.5-20 hrs	9	5 x week = 1
21-24 hrs	1	36 patients
24-26 hrs	1	
30-45 hrs week	3	

Table 8. Home haemodialysis dose (hours on dialysis)

- Eighteen patients (47%) are dialysing >15 hours week
- Five patients (12%) are performing overnight (nocturnal) dialysis
- Eleven patients (33%) are dialysing on alternate days or more
- Twenty-four patients (67%) are using an ESA.

Summary

- The number of delivered haemodialysis treatments has not changed significantly in recent years.
- Our haemodialysis units are able to offer the full range of options for patients including in-centre, satellite, nocturnal and home haemodialysis.
- With the addition of the Fresenius Medical Centre we have been able to ensure a more manageable 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.
- Although many patients were tested for COVID-19, we were very fortunate not to suffer from any COVID-19 infections in our units. This is remarkable considering what is happening around the world.

8. PERITONEAL DIALYSIS

Claire Cuesta, Franziska Pettit

Activity

Peritoneal dialysis was used to treat 16.4% of all dialysis patients in St George compared to 17% reported in the 43rd Annual ANZDATA report (2020).

A total of 62 patients were on PD in 2020 compared to 67 in 2019. In December 2020, the proportion of patients receiving automated peritoneal dialysis (APD) was 78% and 22% for continuous ambulatory peritoneal dialysis (CAPD). Our CAPD population is gradually increasing in the past 2 years, at 20% in 2019 from 9% in 2018. Our APD population continues to be above the proportion reported by ANZDATA of 69%.

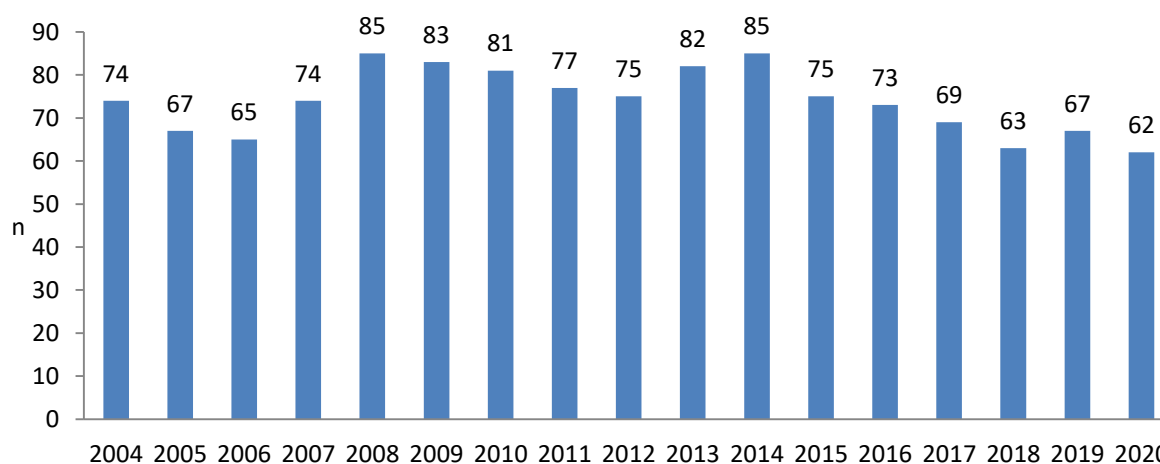


Figure 37. Total persons (prevalent and incident) on peritoneal dialysis

APD	ANZDATA 69% (1645/2387)	St George 78% (32/41)
CAPD	ANZDATA 31% (742/2387)	St George 22% (9/41)

PD patient flow

PD patients December 31st 2019			45
In	New Patients	16	
	Transfer from another hospital	0	
	Transfer from HD	1	
	On hospital IPD	0	
	Returns from dialysis break	0	
In Subtotal			17
Out	Transplants	2	
	Transfer to other units	2	
	Transfer to overseas	0	
	Planned transfer to Satellite Haemodialysis	1	
	Permanent Transfers to Haemodialysis	6	
	Return of renal function	1	
	Withdrawal from dialysis	4	
	Deaths on PD	5	
Out Subtotal			21
Net loss		4	
PD patients December 31st 2020			41

Table 9. PD Patient Flow

KPIs

The benchmarks for peritoneal dialysis were mostly set or established by ANZDATA, CARI, KDOQI and ISPD. For outcomes without set benchmark, results were compared to previous year's audits.

1. Biochemical targets

Parameter	Target	Apr 17	Oct 17	Apr 18	Oct 18	Apr 19	Oct 19	Apr 20	Oct 20	ANZDATA 20
Corr Ca	2.1-2.4 mmol/L	29%	42%	59%	57%	53%	67%	50%	59%	-
PO4	0.8-1.6 mmol/L	53%	46%	47%	48%	46%	36%	54%	39%	36%
CaPO4	<4.0 mmol/L	42%	44%	41%	44%	44%	40%	38%	30%	-
Uncorrected CaPO4	<4.0 mmol/L	60%	52%	55%	61%	55%	50%	44%	39%	53%
Albumin	33-48 g/L	31%	24%	34%	26%	28%	32%	46%	44%	-
PTH	7-45 mmol/L	63%	61%	59%	59%	54%	61%	60%	52%	-

Table 10. Biochemical targets

- Serum Calcium

- 59% of patients achieved the target for corrected calcium in October 2020. The ANZDATA benchmark was for uncorrected calcium only. Our uncorrected serum Ca profile in October 2020 was better than ANZDATA 2020.
- 63% of patients have serum Ca level 2.2-2.4 in October 2020. The mean calcium result was 2.31 (SD 0.17).

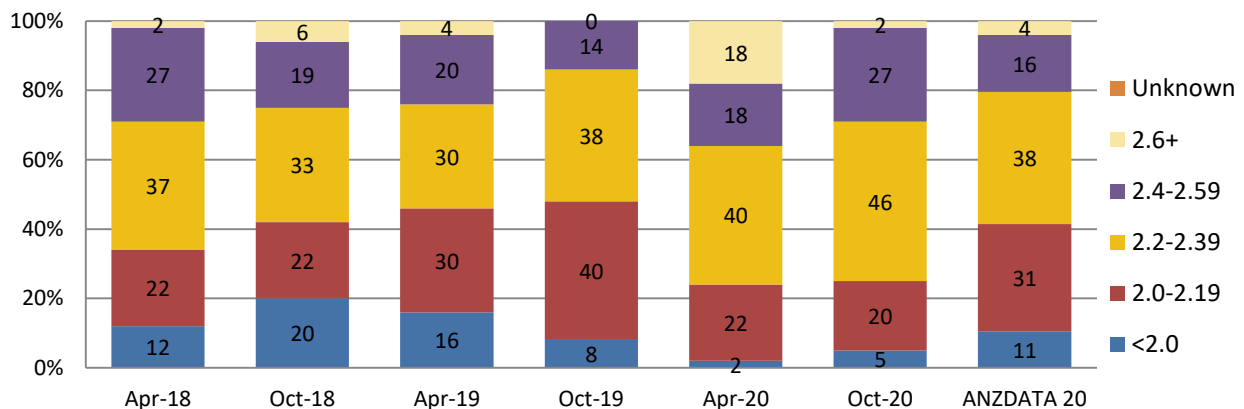


Figure 38. Uncorrected Serum Calcium (mmol/L)

- Phosphate

In October 2020, 39% of patients were within the target for serum phosphate of 0.8-1.6 mmol/L, slightly better than ANZDATA 2020 at 36%. The mean phosphate result was 1.89 mmol/L (SD 0.40).

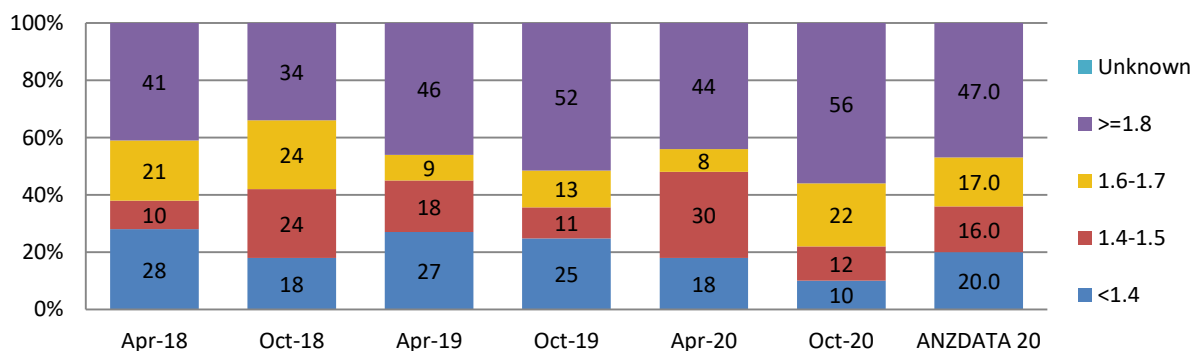


Figure 39. Serum Phosphate (mmol/L)

- Calcium Phosphate Product
 - ANZDATA calculated the calcium phosphate product with uncorrected calcium. There were more patients with high uncorrected calcium x phosphate (≥ 5) in 2020 compared to ANZDATA 2020, the mean uncorrected calcium x phosphate product was 4.36 (SD 0.92)
 - We also calculate Calcium phosphate product with corrected calcium, the mean for our corrected Calcium phosphate product in 2020 was 4.7 (SD 1.04)

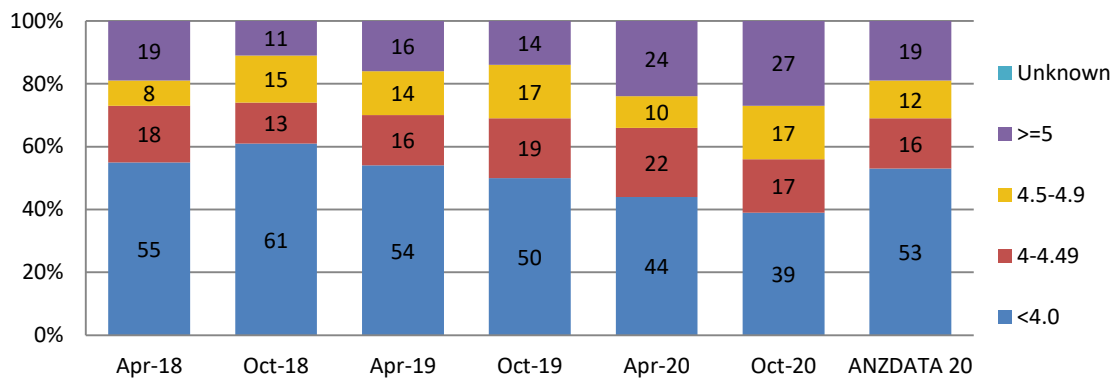


Figure 40. Uncorrected Calcium x Phosphate Product

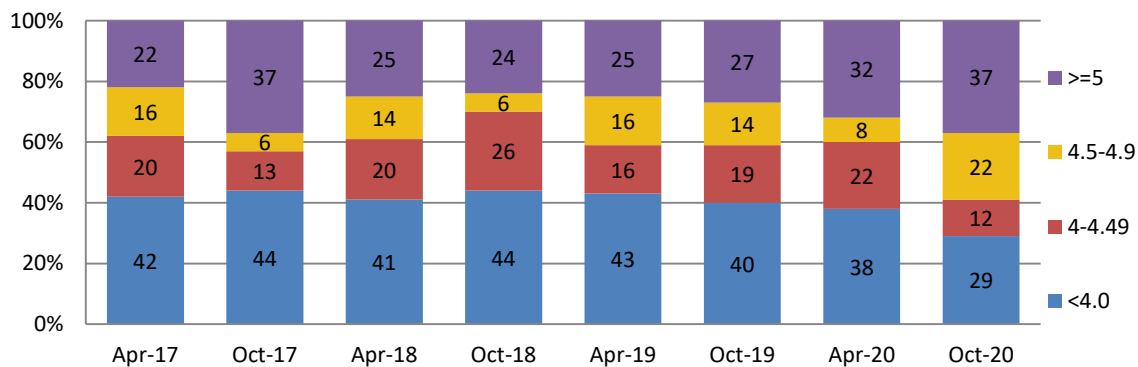


Figure 41. Corrected Calcium x Phosphate Product

- Albumin
 - 44% of PD patients had albumin level within 33-48 g/L in 2020, better than last year at 32%. 20% of PD patients had albumin level 30-32 g/L and mean albumin level was 32g/L (SD 5.94).
- PTH
 - In October 2020, 51% of PD patients had PTH 7-45 mmol/L. The median PTH result in 2020 was 27.3 mmol/L (CI 26, 57). More patients (31%) have higher PTH in 2020 compared to last year at 29%.

2. Haematological targets

- Haemoglobin
 - 56% achieved our target of 100-120 g/L in October 2020, better than last year and similar to ANZDATA 2020, mean Hb was 109 g/L (SD 16, min 74, max 145).
 - In October 2020, only 80% of PD patients with Hb <100 were receiving erythropoiesis stimulating agents (ESA). 38% of PD patients with high Hb (>120) were also receiving ESA. These patients had stopped or reduced ESA dosing frequency. 10% of patients who had Hb below 100 g/L had iron studies below the target range (ferritin 200-800 ug/L and transferrin 20-50%), an improvement from last year's 14%. This patient received iron infusion.

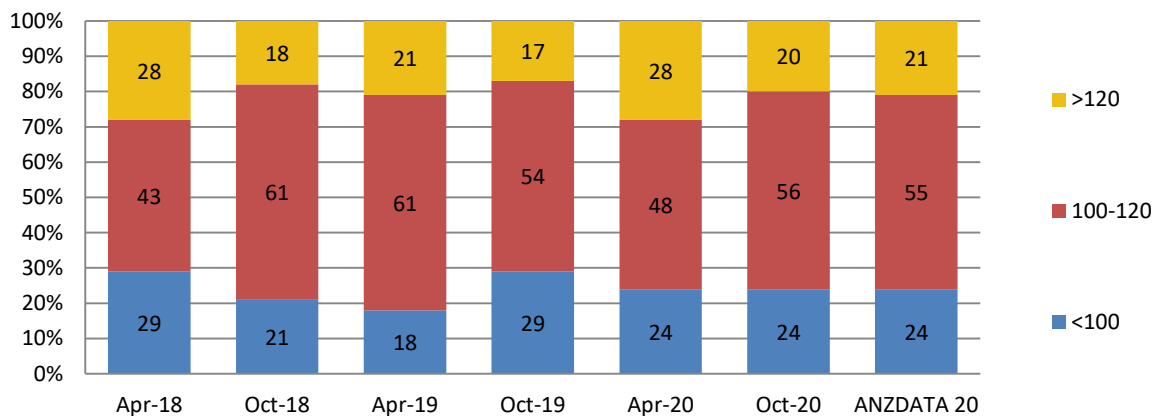


Figure 42. Haemoglobin in Peritoneal Dialysis patients

- HbA1c (Glycosylated Haemoglobin)
 - 54% of peritoneal dialysis patients in 2020 has diabetes.
 - All patients with diabetes were screened for HbA1C in October 2020. The mean HbA1C result was 6.5% (SD 1.1, min 4.1%, max 8.7%). 46% of screened diabetic patients had results below 7%, an improvement from last year's 36%.
 - Adjusting the HbA1c target to the International Society of Peritoneal Dialysis (ISPD) recommendation of $\leq 7\%$ for diabetic PD patients and up to $< 8.5\%$ for our older PD patients with diabetes (presumably > 70 years as age group for elderly was not defined by ISPD), 73% of screened diabetic patients were within ISPD target in 2020, better than last year at 61%.

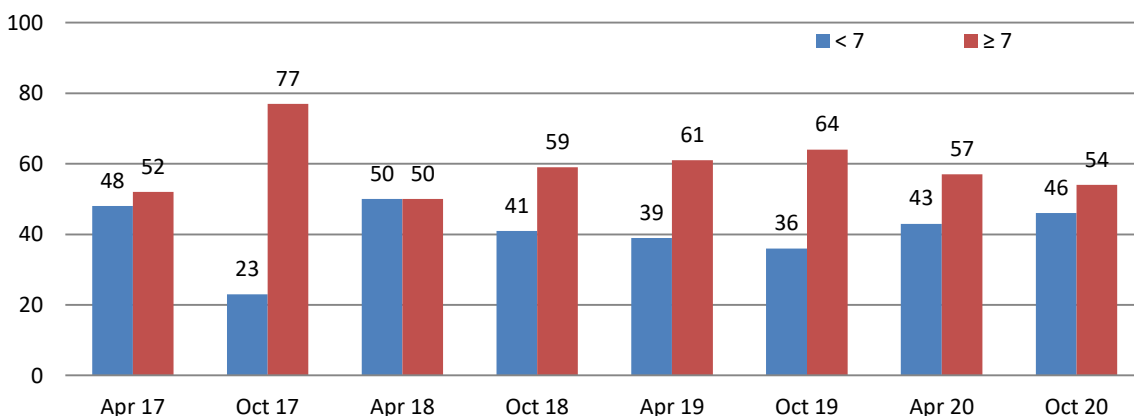


Figure 43. HbA1c results in PD patients

- Lipids

66% of PD patients in October 2020 were considered high-risk, these included patients having or suspected of having diabetes, coronary artery disease, cerebrovascular disease and peripheral vascular disease. Lipid studies were collected for 96% of high-risk PD patients and in 2020, results were mixed: Cholesterol and LDL were worst, Triglyceride was similar and HDL was better than last year.

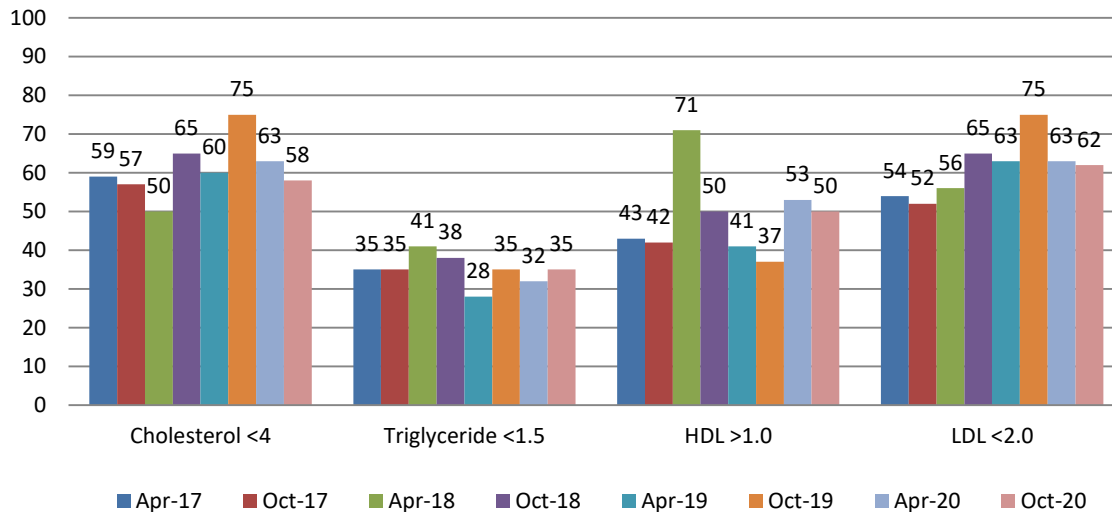


Figure 44. Lipids within normal limits in high risk patients only

- Iron

- Iron replete refers to ferritin levels between 200-800ng/mL as well as iron saturation between 20-50%. 47% of PD patients were iron replete in October 2020, similar to last year. Median ferritin was 263 ug/L (CI 255, 420), mean transferrin was 26.25% (SD 10.82, min 10.3%, max 67.3%). Our iron profile for October 2020 was better than ANZDATA 2020.

Parameter	Target	Apr 17	Oct 17	Apr 18	Oct 18	Apr 19	Oct 19	Apr 20	Oct 20	ANZDATA 20
Ferritin	200-800 ug/L	61%	69%	53%	57%	68%	62%	70%	66%	54%
Transferrin	20-50%	67%	69%	47%	57%	68%	58%	80%	73%	64%

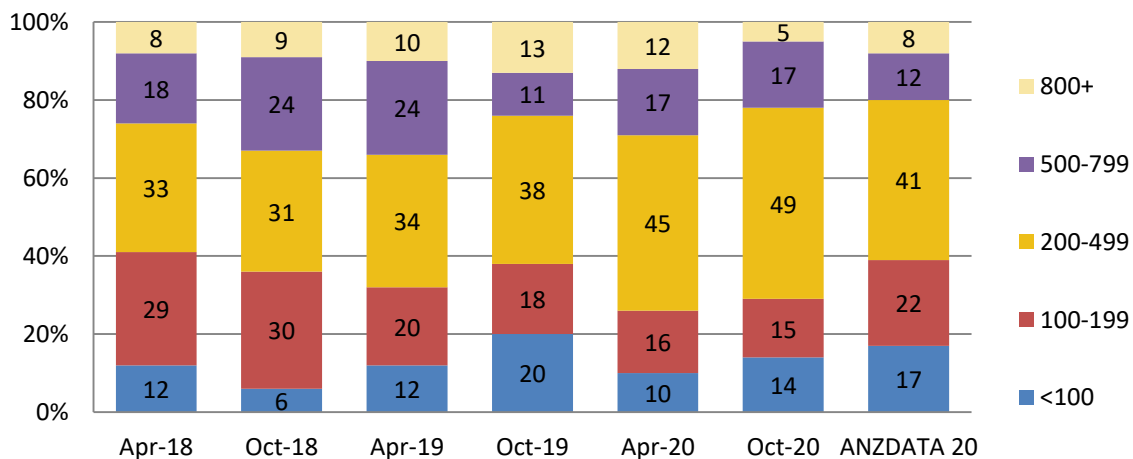


Figure 45. Ferritin (ug/L)

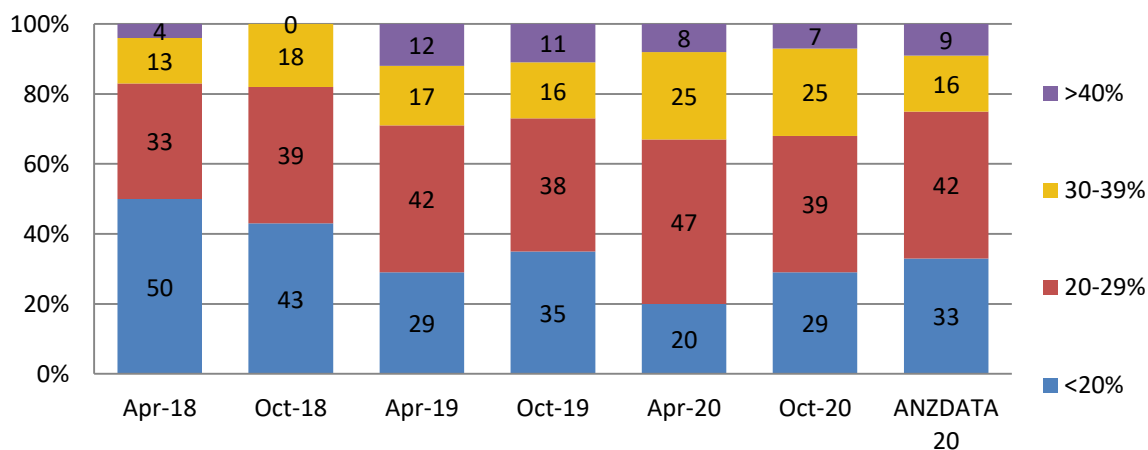


Figure 46. Iron Saturation (Transferrin)

3. Dialysis Adequacy

Peritoneal dialysis adequacy is determined using solute clearance measurements:

- Kt/V – Benchmarked against the KDOQI and ISPD target of at least 1.7 per week. In October 2020, the mean Kt/V was 2.35 (SD 0.995, min 1.07, max 5.21)
- 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 October 2020, mean creatinine clearance was 78.7 L/week/1.73 m² (SD 37.45, min 35.17, max 185.35) and 82% of APD patients had creatinine clearance of >45 L/week/1.73m² (ISPD target for patients on APD).

Parameter	Target	Apr 17	Oct 17	Apr 18	Oct 18	Apr 19	Oct 19	Apr 20	Oct 20
KT/V	≥ 1.7	77%	80%	72%	73%	67%	79%	71%	77%
CCL	>50L (L & LA) or >60L (H & HA)	72%	75%	69%	73%	67%	77%	67%	75%
CCL (ISPD)	>45L (for APD patients)	84%	84%	92%	95%	73%	89%	73%	82%

Table 11. Dialysis adequacy

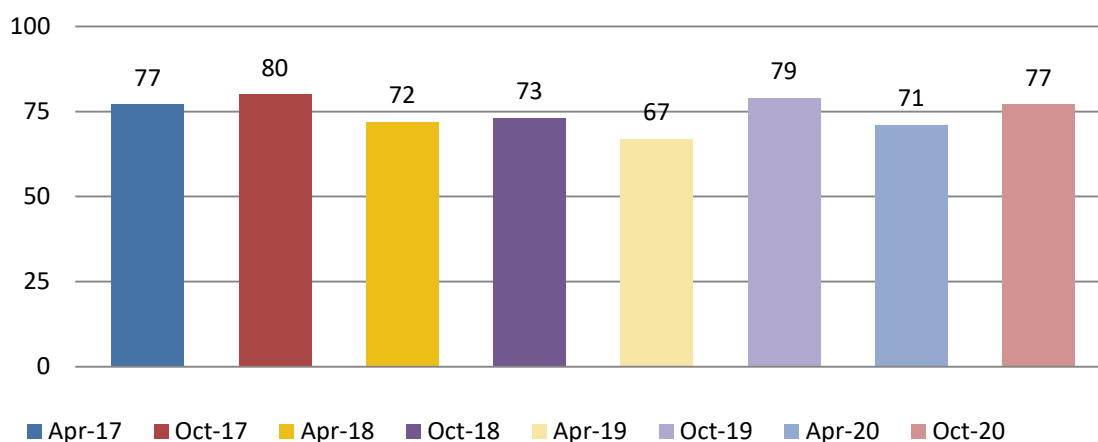


Figure 47. Kt/V ≥ 1.7

4. Patient and Technique Survival

Survival is analysed from the 90th day of treatment until death. Censoring occurs at first transplant, loss to follow-up or recovery of renal function lasting >30 days. Graphs and tables are from ANZDATA Individual Hospital Report 2014-2019. The 5-year patient and technique survival rate for St George Hospital was comparable to the national rates of Australia and New Zealand.

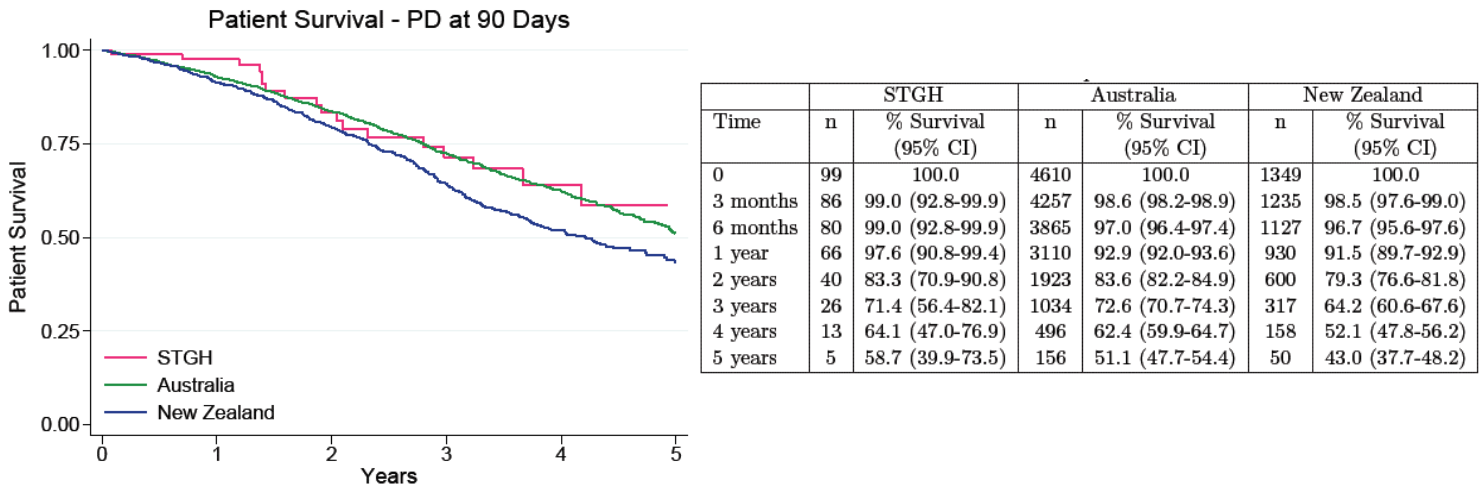


Figure 48. PD Patient survival at 90 days- ANZDATA individual hospital report 2014-2019

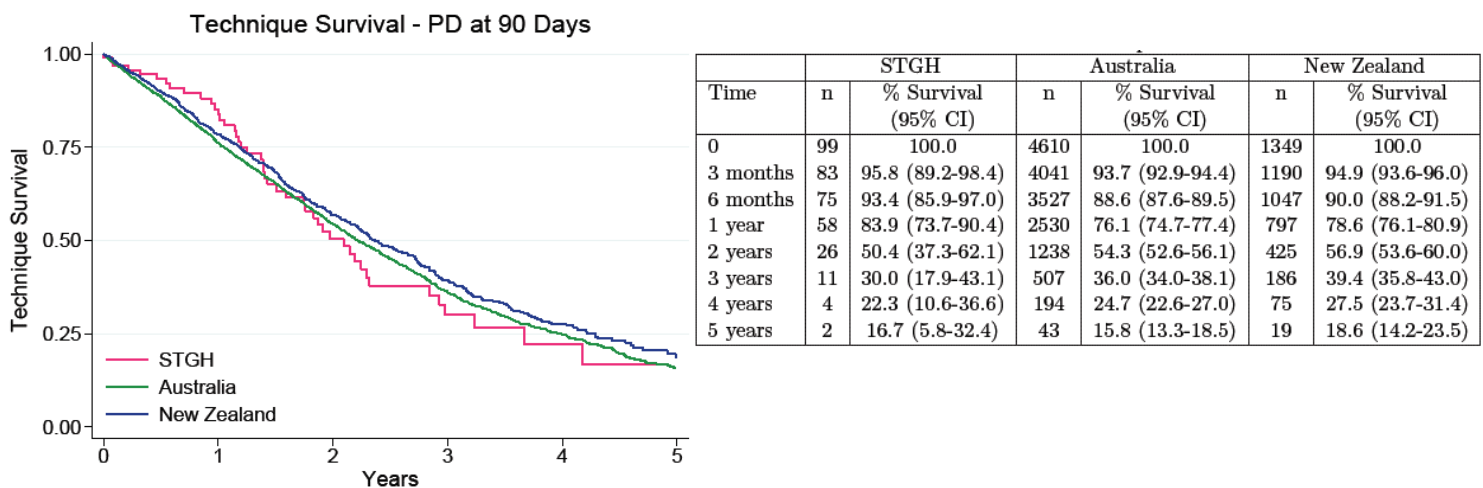


Figure 49. PD Technique Survival – PD at 90 days. ANZDATA individual hospital report 2014-2019)

5. Technique Failure

- ANZDATA 2020 reported the commonest cause of technique failure (ceasing peritoneal dialysis apart from deaths and transplant) was “total dialysis/technical failure” at 46%, followed by infection at 24%. At St George Hospital, the primary cause of technique failure in 2020 was similar to ANZDATA with “total dialysis/technical failure” being the main cause at 57%. These were due to peritoneal leak and inadequate solute clearance and ultrafiltration due to peritoneal membrane failure.
- ANZDATA 2020 included and reported ‘death’ as the primary cause of PD technique failure at 34% followed by ‘total dialysis/technical failure’ at 31%. At St George Hospital, the primary cause of technique failure in 2020 “total dialysis/technical failure” being the main

cause at 42%, followed by 'death' at 27%. The commonest cause of death was cardiac failure.

- Seven patients were transferred to haemodialysis permanently in 2020. Mean age of patients at time of transfer to haemodialysis was 66 years (min 51, max 74) and mean time on PD at time of transfer to haemodialysis was 15.3 months (min 7, max 30).

Primary reason for technique failure	2012 n=9	2013 n=12	2014 n=17	2015 n=9	2016 n=14	2017 n=13	2018 n=11	2019 n=10	2020 N=14	ANZDATA 2020
Infective	22%	30%	23%	0%	18%	21%	18%	10%	14%	24%
Total Dialysis/Technical Failure (leaks and inadequate dialysis)	78%	60%	60%	89%	64%	65%	64%	50%	57%	46%
Social (acopia)	0%	10%	17%	11%	18%	14%	9%	10%	14%	9%
Other causes (transfer to other unit or transfer outside of Australia)	0%	0%	0%	0%	0%	0%	9%	30%	14%	11%
Reason not reported	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%

Table 12. Primary reason for technique failure

6. PD-related Infection rates

Peritonitis episodes and rates

- 2020 peritonitis rate results continue to surpass the national benchmark. The St George peritonitis rate over a 3 year period from 2018–2020 was 1/80 months.
- 83% (34/41) of patients on peritoneal dialysis in 2020 were peritonitis-free.
- The average time on dialysis for current patients who have had peritonitis was 38 months and for all patients who have had peritonitis in 2020 was 42 months. The average time on dialysis for current patients who are peritonitis free was 21.7 months and for all peritoneal dialysis patients who were peritonitis free in 2020 was 22.7 months. Both data suggests the longer patients stay on PD, the higher the risk of developing peritonitis.
- In 2020, 5% (3/62) of our patients could expect peritonitis in any one year, in comparison to 46% 14 years ago
- The number of episodes of peritonitis and the number of patients who had peritonitis in 2020 slightly increased from last year. The proportion of peritoneal dialysis patients who were 3 years peritonitis-free in 2020 was 69%, better than ANZDATA 2020 at 51%.

Year	STGH			Australia		
	Episodes	Years	Rate (95% CI)	Episodes	Years	Rate(95% CI)
2014	8	64.32	0.12 (0.05-0.25)	847	2296.54	0.37 (0.34-0.39)
2015	5	55.20	0.09 (0.03-0.21)	906	2411.41	0.38 (0.35-0.40)
2016	10	52.39	0.19 (0.09-0.35)	823	2400.33	0.34 (0.32-0.37)
2017	8	45.57	0.18 (0.08-0.35)	771	2362.26	0.33 (0.30-0.35)
2018	7	42.70	0.16 (0.07-0.34)	776	2362.56	0.33 (0.31-0.35)
2019	6	44.69	0.13 (0.05-0.29)	624	2316.32	0.27 (0.25-0.29)
Overall	44	304.86	0.14 (0.10-0.19)	4747	14149.42	0.34 (0.33-0.35)

Table 13. Rates of peritonitis (per patient-year) ANZDATA Individual Hospital Report 2014-2019

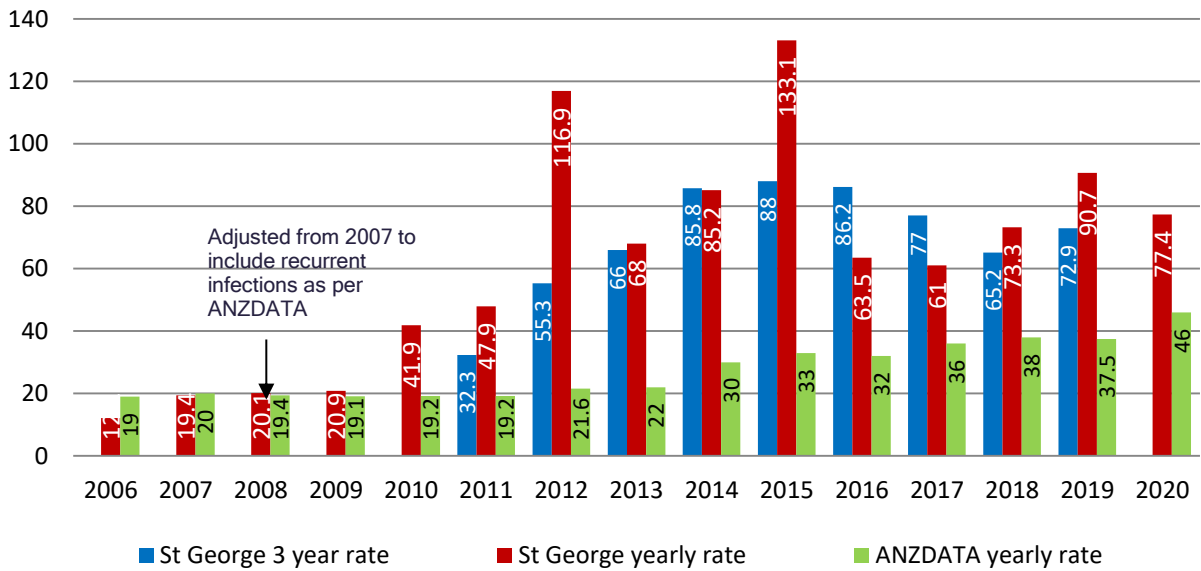


Figure 50. Patient months per episode of peritonitis

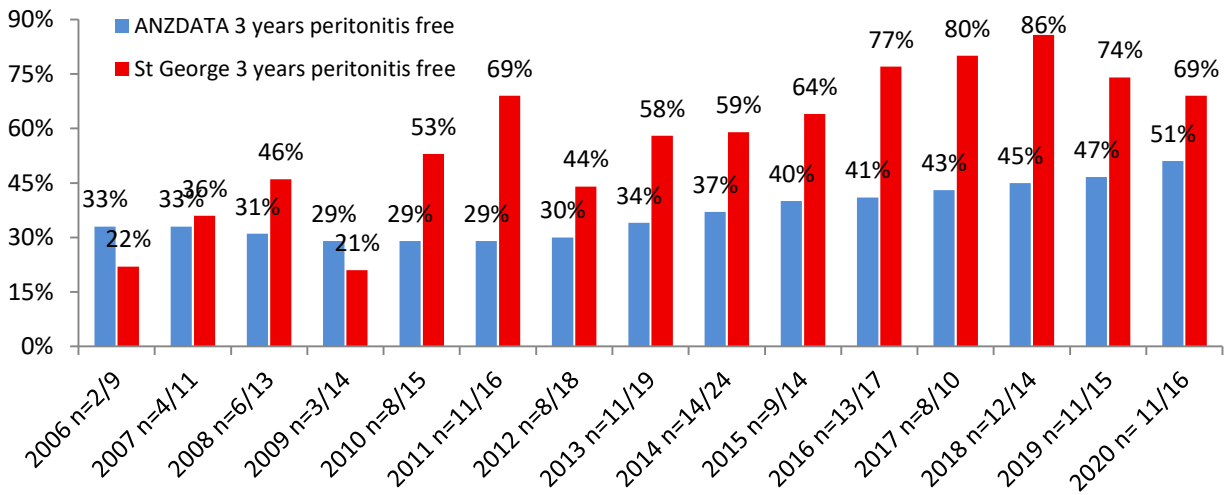


Figure 51. Proportion of patients 3 years peritonitis free

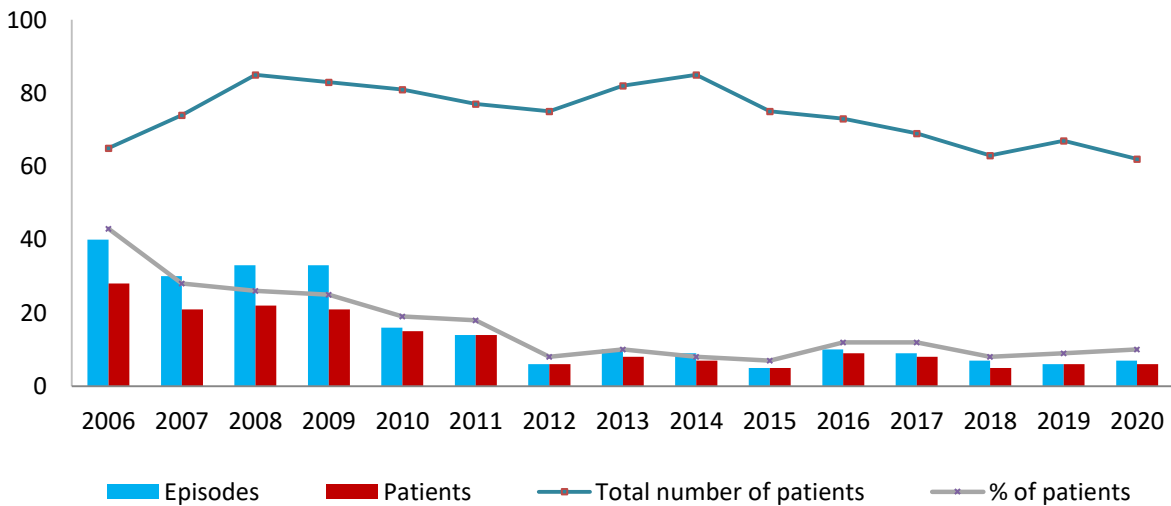


Figure 52. Peritonitis Episodes

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total patients	83	81	77	75	82	85	75	73	69	63	67	62
Peritonitis episodes	33	16	14	6	10	9	5	10	9	7	6	7
Patients with at least 1 episode of peritonitis	n=21 25%	n=15 19%	n=14 18%	n=6 8%	n=8 10%	n=7 8%	n=5 7%	n=9 12%	n=8 12%	n=5 8%	n=6 9%	n=6 10%
Patients with at least 1 episode of Exit site infection	n=13 16%	n=16 20%	n=16 21%	n=11 15%	n=3 4%	n=8 9%	n=4 5%	n=4 5%	n=5 7%	n=4 6%	n=5 7%	n=6 10%

Table 14. Peritonitis episodes

Change of treatment as a result of peritonitis:

The peritonitis data was measured to determine the rate of transfer to haemodialysis as a direct result of peritonitis. 1 patient was transferred permanently to haemodialysis as a result of peritonitis in 2020.

Change in treatment as a direct result of peritonitis (%)	2009*	2010*	2011*	2012*	2013*	2014*	2015	2016	2017	2018	2019	2020
Interim Haemodialysis	0	6	0	0	0	0	0	0	0	0	0	0
Permanent Haemodialysis	15 (5/33)	24 (4/17)	14 (2/14)	16 (1/6)	30 (3/10)	33 (3/9)	0	10 (1/10)	44 (4/9)	28 (2/7)	17 (1/6)	14 (1/7)
Catheter removed	15 (5/33)	41 (7/17)	14 (2/14)	16 (1/6)	30 (3/10)	33 (3/9)	0	10 (1/10)	44 (4/9)	28 (2/7)	17 (1/6)	14 (1/7)

Table 15. Change of treatment as a result of peritonitis

- Half of the peritonitis episodes in 2020 were from gram negative organisms, followed by gram positive organisms.
- There were no MRSA peritonitis infections since 2011.

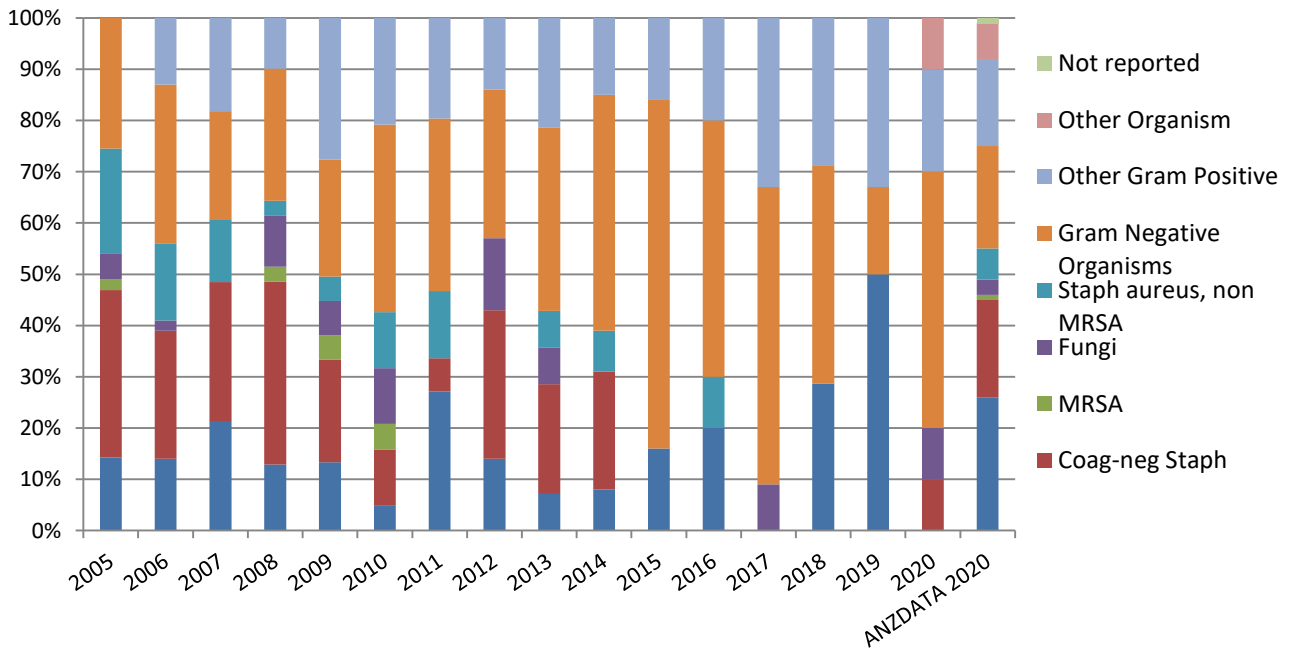


Figure 53. Peritonitis Causative Organism

Exit Site Infections (ESI)

- ANZDATA does not collect data on exit site infections, we can only compare to previous year's result.
- 2020 exit site infection rate was 1/90.25 months. Exit site infection rate over a 3 year period from 2018–2020 was 1/99.91 months.
- Similar to the past 4 years, gram negative organism was the commonest organism of exit site infection in 2020.
- 10% of PD patients had exit site infection in 2020.

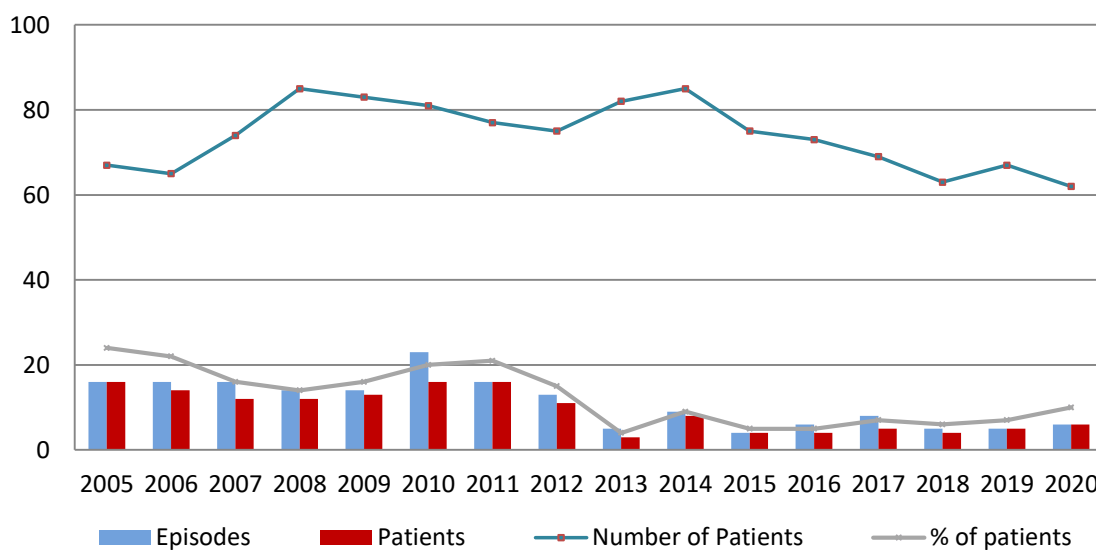


Figure 54. Exit Site Infection Episodes

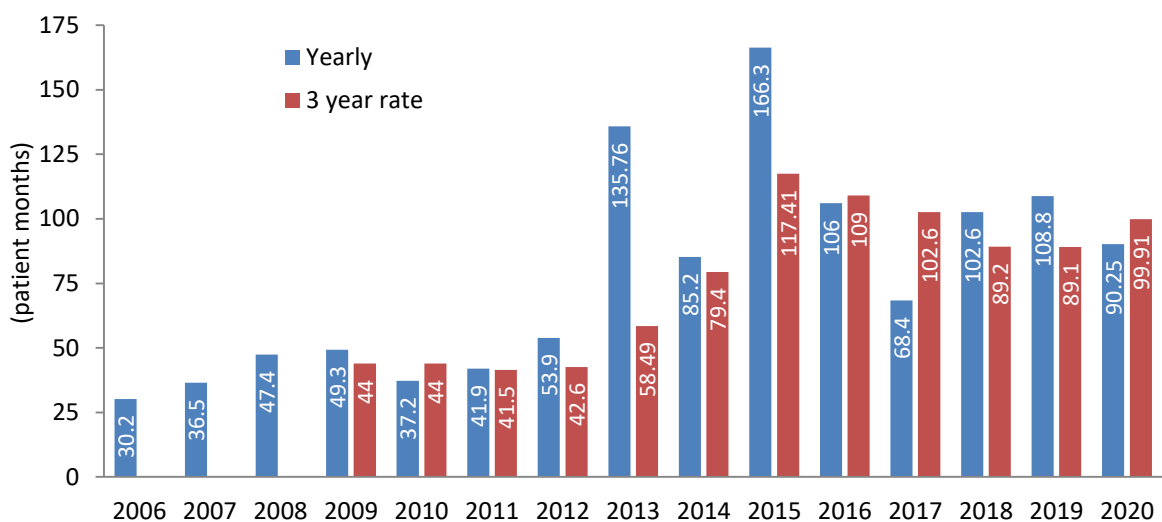


Figure 55. Exit site infection rate per patient months

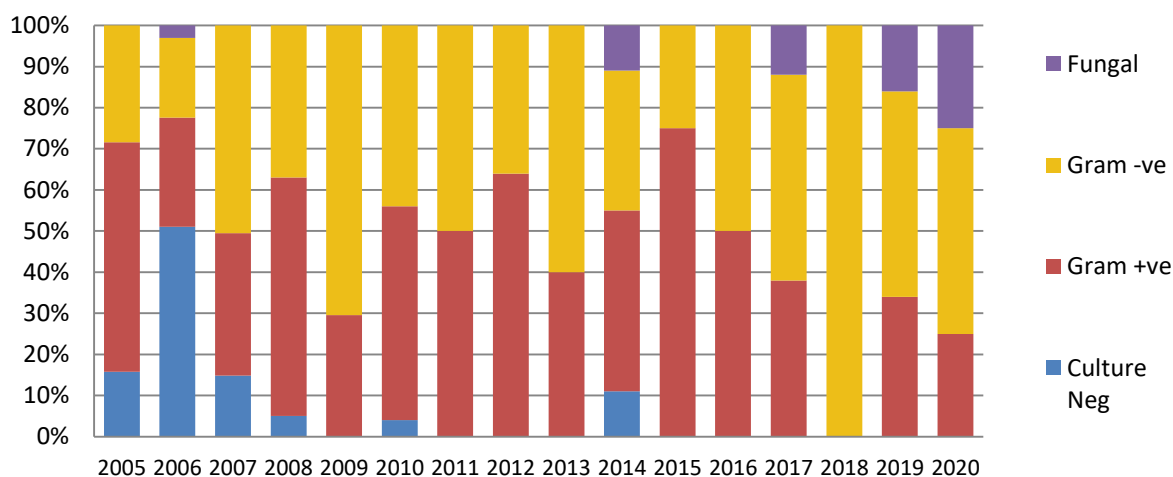


Figure 56. Exit site infection causative organisms

7. Change of Modality and Deaths

- We have fewer transfers to haemodialysis, fewer kidney transplants and more deaths than the national average in 2020.
- Average age of our patients at time of death was 77 years (min 66, max 89) and average time on PD at time of death was 43 months (min 0.2, max 107.1).

	SGH 2012 (%)	SGH 2013 (%)	SGH 2014 (%)	SGH 2015 (%)	SGH 2016 (%)	SGH 2017 (%)	SGH 2018 (%)	SGH 2019 (%)	SGH 2020 (%)	ANZDATA 2020 (%)
Transplants	5	4	11	17	4	10	14	5	2	14
Changed to haemodialysis	16	15	26	17	19	40	23	16	17	20
Deaths	9	8	5	4	12	25	7	20	17	12

Table 16. Change of Modality and deaths

Note: The rates were calculated using the total number of patients on peritoneal dialysis at 31.12.2020 (n=41), the method used by ANZDATA to calculate their rates.

Summary

1. ANZDATA results are the benchmark used for comparison with St George results.
2. APD remains the preferred PD therapy.
3. There's an increasing preference to CAPD in the past couple of years.
4. Improvements with anaemia, iron & nutrition management in 2020.
5. Patient survival and technique survival rate are similar with the national rates.
6. St George continue to have very low rates of peritonitis and exit site infections:
 - a. Peritonitis rates continue to be better than the national data.
 - b. The percentage of patients who were peritonitis-free at 3 years remains higher than ANZDATA.
 - c. 95% patients were peritonitis-free on their first year of peritoneal dialysis.
 - d. 83% patients on peritoneal dialysis at the end of 2020 were peritonitis – free.
7. Fewer change to haemodialysis & more deaths in 2020 than that of the national rate. The commonest cause of death was cardiac failure.
8. Consistently similar to the national data and the previous years was “total dialysis and technical failure” as the primary reason for PD technique failure.

Research activities

- St George PD unit will participate in the TEACH – PD trial (Targeted Education ApproaCH to improve Peritoneal Dialysis outcomes). This is a pragmatic phase 4, multi-centre, multinational, cluster-randomised trial (CRCT), randomising PD units to implement TEACH-PD training modules targeted at PD trainers and incident PD patients versus standard existing practices. It aims to determine whether implementation of standardised training modules based on the ISPD guidelines, targeting both PD trainers and patients, results in a longer time to the composite end-point of exit site infections, tunnel infections, and peritonitis in incident PD patients compared with existing training practices. Approved by NHMRC for \$2.38M from MRSS fund. Site ethics (HREC & SSA) approval received in 2020. Commencement delayed due to COVID – 19, rescheduled to commence in early 2021.

Management: Clinical and QA activities

- Patient Satisfaction survey was completed for all PD patients in early 2020. 57% responded. Survey questions and responses were divided into 4 sections:
 - Overall management of care – All responders were satisfied with the service, support and clinical advice provided by the PD nurses.
 - Educational needs – Almost all responders were satisfied with the PD training/retraining and periodic education (PD newsletter) they received from the PD nurses. Half of them believed they will benefit from more education sessions but only very few would be interested to attend retraining sessions or to meet other PD patients for group education sessions. Almost all patients are able to use and have access to technical devices i.e. smartphones, notebooks, laptops or computers.
 - APD machine (Claria) & Remote Patient Management/Monitoring (Sharesource) – 72% of the responders confirmed they use Claria machine, all have found it easy to use & believed they received enough training for it. Very few would be interested to attend retraining sessions on Claria machine. Half of the responders have trouble

sleeping whilst connected to Claria machine mostly due to machine alarms or machine noise during dialysis. Almost all responders on Claria machine are aware and satisfied that their APD results are monitored regularly by the PD nurses, however, only half of them are interested in seeing their own APD results on the internet.

- Open questions to encourage feedback and suggestions - majority of the feedback received were praises for the PD nurses for being “excellent, fantastic, great, nice & supportive” and for “always being there”.
- Recommendations that came out from the survey are:
 - Continue the 6 monthly PD newsletter
 - Continue daily APD outcome monitoring & review in Sharesource
 - Provide more information re Sharesource during training and in PD newsletter
 - Continue ad hoc PD retraining
 - Sleep a major issue with Claria machine
 - Explains the increasing CAPD uptake
 - Follow-up with Baxter re less noisy Claria machine
 - Discuss with nephrologists +/- RSC team
 - Repeat survey in 2021
- Mailing of pre-filled blood request forms to patients with SMS reminders increased patient compliance for blood testing, HbA1c screening for patients with diabetes and lipid screening for high risk patients in 2020. This will continue in 2021 and we will continue to utilise the home collection service for frail patients and/or patients with poor mobility.
- Continue to flag patients with poor biochemistry and haematology results through renal clinic, 2-monthly multi-disciplinary team (MDT) patient review meetings and electronic communication to dietitian and nephrologists to improve calcium, phosphate, PTH and lipid management.
- Pre PD assessment and education program for predialysis patients choosing PD was converted to telehealth sessions for several months due to COVID – 19 restrictions in 2020. Group education sessions were discontinued in 2020 and face to face sessions were resumed towards the last quarter of 2020.
- Some PD services were modified due to COVID – 19 restrictions in 2020. Patient follow-up through telehealth sessions, daily APD remote monitoring & management and drive through pick – up of PD supplies from the PD unit were facilitated to continue to support PD patients during COVID – 19 crisis last year. These services will be continued in 2021 as required.
- All effective initiatives and projects will continue i.e. clinic review checklist project, nurse-facilitated iron management, bi-annual patient newsletters, 2-monthly MDT patient review, PD retraining program and outpatient follow-up and support

- St George PD training curriculum and 1:1 comprehensive PD training program will be compared and converted to the TEACH – PD curriculum once commenced as St George has been randomised to the intervention group.
- Continue to improve peritoneal dialysis care in the acute or inpatient setting through education programs for nursing staff. Some were temporarily halted in 2020 due to COVID – 19 and all programs resumed towards late 2020:
 - Progressive competency – based training program for renal ward nurses in:
 - CAPD and APD including Sharesource remote patient monitoring
 - Back to basic PD knowledge and skills
 - 5 – yearly PD competency re – assessment and re – training
 - Mentorship program to advance the PD knowledge and skills of identified PD champions in the renal ward and emergency department
 - Education and mentorship program to advance the renal knowledge & skills of identified renal champions from the renal ward and dialysis unit will be commenced in 2021 in collaboration with other renal CNCs and renal CNEs with full support from the nurse manager and nurse unit managers.
- 9 nursing homes within the SGH catchment area were trained on PD. No new nursing homes were trained on PD due to COVID – 19 restrictions in 2020. The structured PD support and training program tailored to nursing home nurses to streamline the uptake of PD patients into aged care facilities will be resumed in 2021 if needed and if permitted under the most recent COVID – 19 guidelines.
- Continue the 3-yearly review of PD policies to keep in line with national (CARI) and international (ISPD) clinical practice guidelines.

9. TRANSPLANTATION

Tania Burns

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 246 kidney transplant recipients and 74 living kidney donors were under the care of the SGH team during 2020.
- Fourteen people received a kidney transplant: four from live donors and ten from deceased donors. One of these people died within 6 weeks of transplant .
- Three people donated a kidney.
- One of the live donor transplants was pre-emptive.
- Four transplant recipients died with functioning grafts.
- Two transplant recipients had graft failure and returned to dialysis.
- Two transplant recipients transferred out and three transferred in.
- A total of 45 people were reviewed at the SGH transplant assessment clinic by a nephrologist from Prince of Wales hospital, the transplanting unit.
- At 31/12/20 28 SGH dialysis patients were active on the transplant waiting list.

Transplant patient flow

1/1/20 SGH transplant patients registered with ANZDATA	229
In	
Transplanted	14
Transferred care in	3
In Subtotal	17
Out	
Transferred care out	2
Died	4
Graft failure transferred back to dialysis	2
Out Subtotal	-8
Net Gain	9
31/12/20 SGH transplant patients	238

Post-transplant follow up

Of the 246 kidney transplant recipients cared for at SGH in 2020:

- 229 were primary grafts, 14 are second grafts and 3 are third grafts
- 80 of these patients received grafts from live donors
- 35 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
- 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.

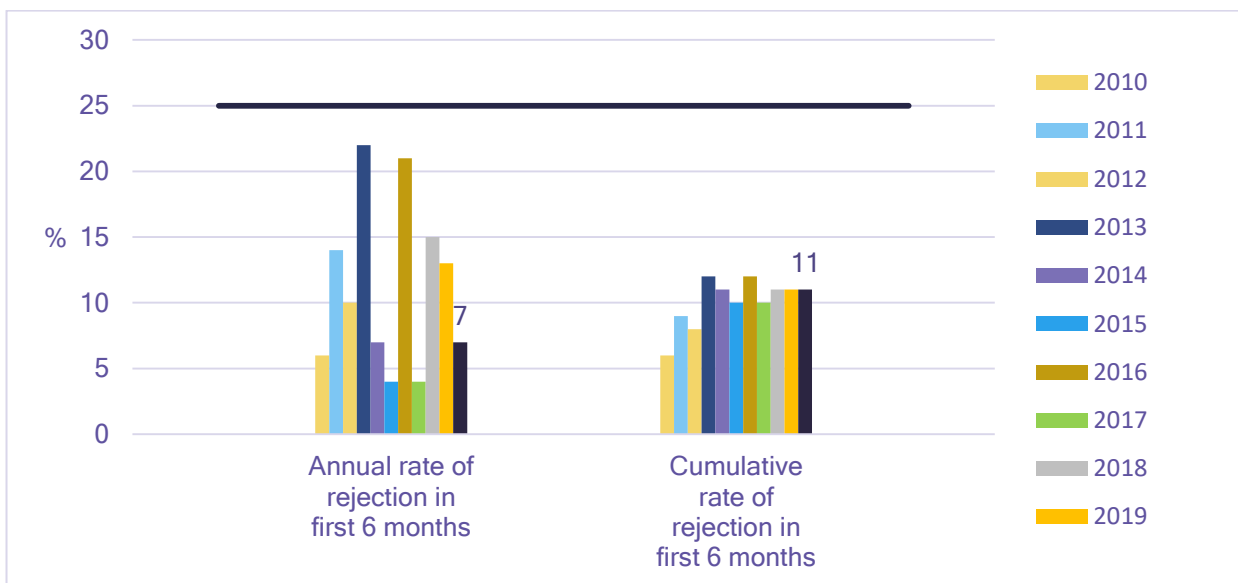


Figure 57. Rate of biopsy proven acute rejection in first 6 months

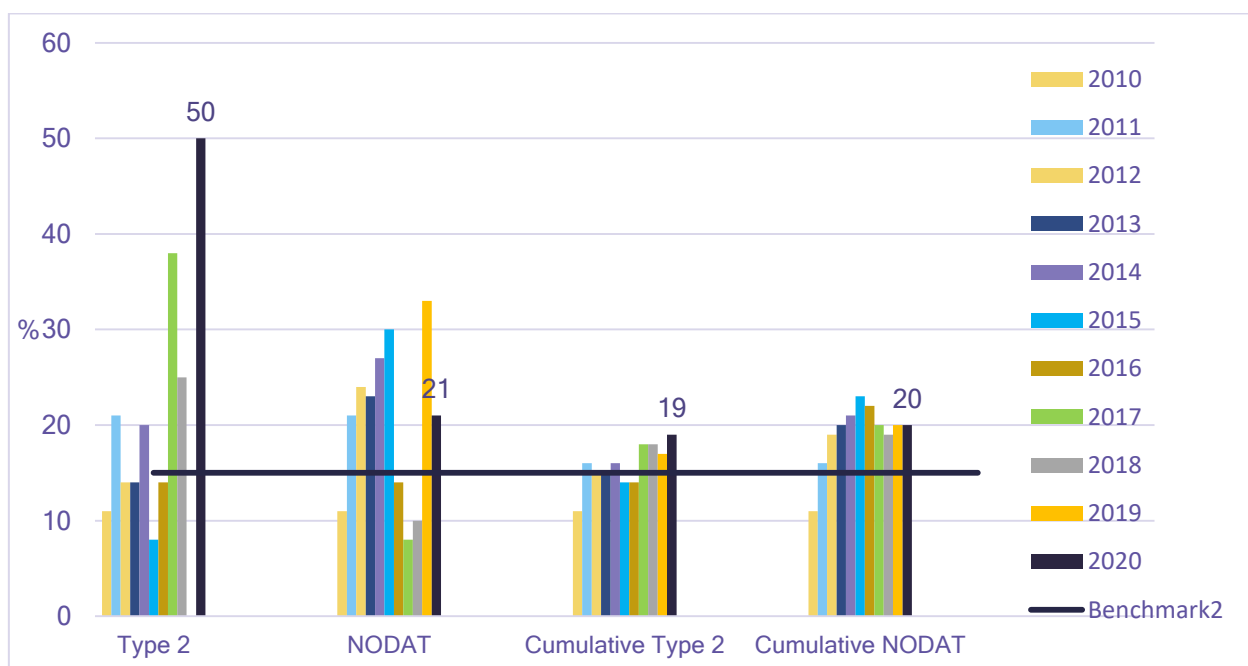


Figure 58. Rate of diabetes in first 12 months

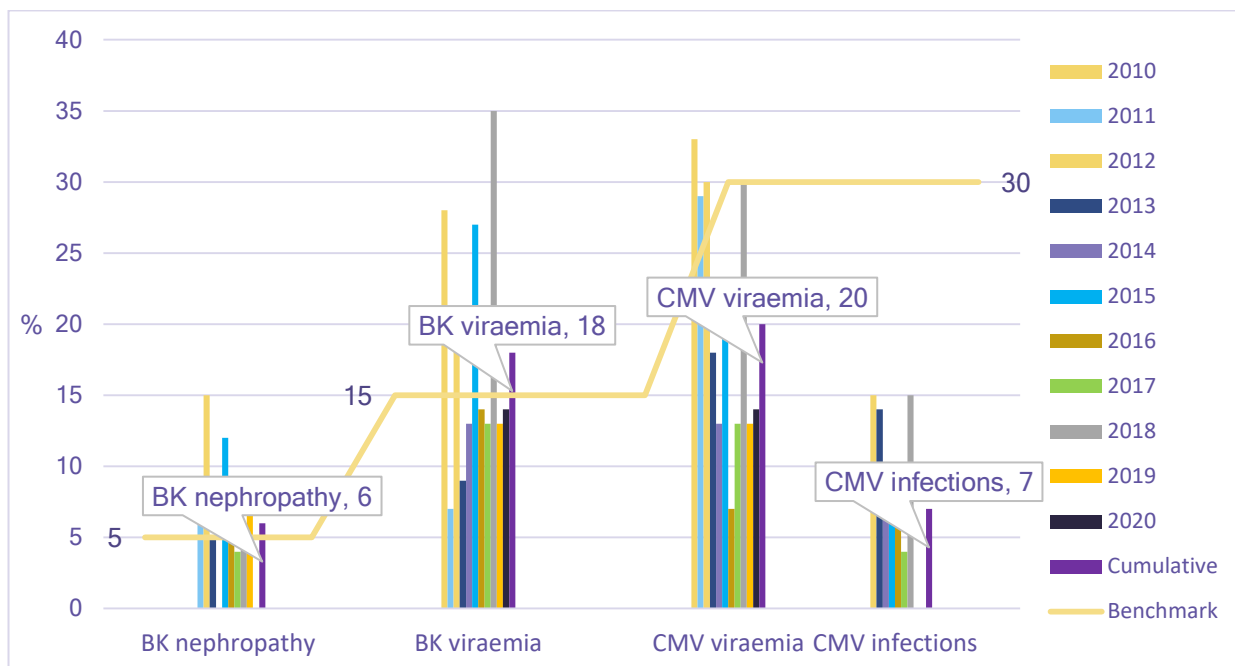


Figure 59. Infection in first 12 months

Graft and Patient Survival ANZDATA report for transplants 2014-2019; n=112

Benchmarks are against the national average

1. Deceased Donors

- Compared with national data:
 - Recipients of deceased donor grafts from SGH hospital are more commonly of Asian descent (30% vs. 15%); and have spent a longer time on dialysis (89% vs. 66% >2yrs dialysis) than the national average.
 - SGH recipients of deceased donor organs have better than national patient and graft survival.

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	68	100.0	3682	100.0	485	100.0
3 months	66	98.5 (90.0-99.8)	3460	99.0 (98.6-99.3)	450	98.3 (96.7-99.2)
6 months	64	98.5 (90.0-99.8)	3274	98.4 (97.9-98.8)	420	97.4 (95.5-98.5)
1 year	60	97.0 (88.4-99.2)	2898	97.6 (97.0-98.1)	369	97.2 (95.2-98.4)
2 years	45	97.0 (88.4-99.2)	2142	95.4 (94.6-96.1)	287	96.3 (94.0-97.7)
3 years	35	94.8 (84.3-98.3)	1514	93.5 (92.5-94.4)	180	94.3 (91.2-96.3)
4 years	27	94.8 (84.3-98.3)	920	91.4 (90.1-92.6)	107	92.4 (88.5-95.1)
5 years	7	94.8 (84.3-98.3)	423	88.5 (86.6-90.1)	50	90.2 (84.7-93.8)

Table 17. Patient survival for primary deceased donor grafts (ANZDATA Individual Hospital Report 2014-2019 (Table 11))

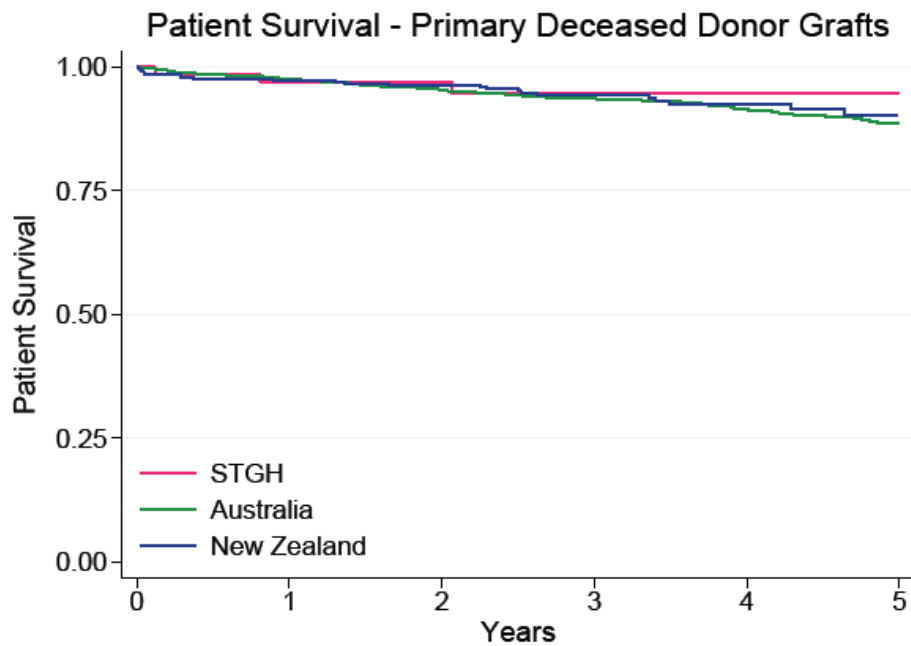


Figure 60. Patient survival – Primary deceased donor grafts (ANZDATA Individual Hospital Report 2014-2019)

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	74	100.0	4263	100.0	536	100.0
3 months	70	97.3 (89.6-99.3)	3945	97.5 (97.0-97.9)	492	96.8 (94.9-98.0)
6 months	68	97.3 (89.6-99.3)	3718	96.4 (95.7-96.9)	457	95.8 (93.7-97.2)
1 year	63	95.8 (87.7-98.6)	3276	94.7 (94.0-95.4)	395	94.7 (92.4-96.3)
2 years	46	94.1 (85.0-97.8)	2424	91.8 (90.9-92.7)	300	92.1 (89.2-94.2)
3 years	36	94.1 (85.0-97.8)	1679	88.9 (87.7-90.0)	186	88.4 (84.6-91.3)
4 years	27	94.1 (85.0-97.8)	984	85.6 (84.1-87.0)	108	86.1 (81.7-89.5)
5 years	8	94.1 (85.0-97.8)	455	83.1 (81.3-84.7)	51	84.9 (79.7-88.8)

Table 18. Graft survival for deceased donor grafts (ANZDATA Individual Hospital Report 2014-2019 (Table 17))

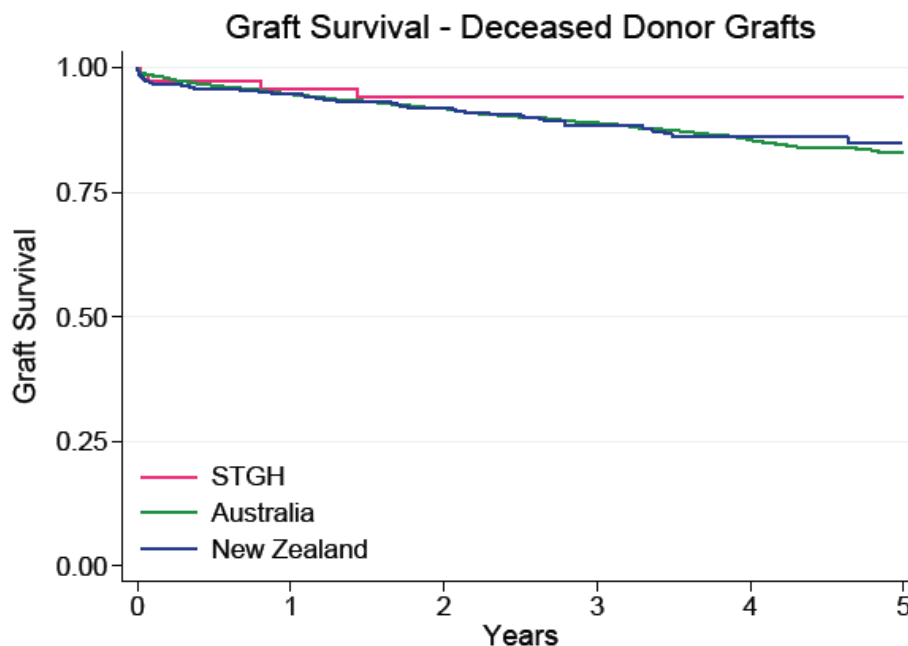


Figure 61. Graft survival – Primary deceased donor grafts (ANZDATA Individual Hospital Report 2014-2019)

2. Live Donors

- Compared with national data:
 - Recipients of living donor grafts from SGH hospital are slightly older (72% vs. 55% >45years) and are more commonly of Asian descent (22% vs. 9%).
 - 50% SGH living donor transplant recipients received their transplant pre-emptively compared to 39% in Australia as a whole.
 - SGH recipients of living donor organs have better than national patient and graft survival.

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	29	100.0	1218	100.0	400	100.0
3 months	28	100.0	1151	99.9 (99.4-100.0)	379	99.0 (97.3-99.6)
6 months	28	100.0	1105	99.7 (99.2-99.9)	359	99.0 (97.3-99.6)
1 year	24	100.0	1010	99.6 (98.9-99.8)	322	98.7 (96.9-99.5)
2 years	22	100.0	803	98.6 (97.6-99.1)	246	98.4 (96.5-99.3)
3 years	10	100.0	592	97.3 (95.9-98.2)	190	98.4 (96.5-99.3)
4 years	6	100.0	368	95.6 (93.7-96.9)	119	96.6 (93.1-98.3)
5 years	4	100.0	197	95.2 (93.1-96.7)	60	93.0 (86.5-96.4)

Table 19. Patient survival for primary living donor grafts (ANZDATA Individual Hospital Report 2014-2019 (Table 12))

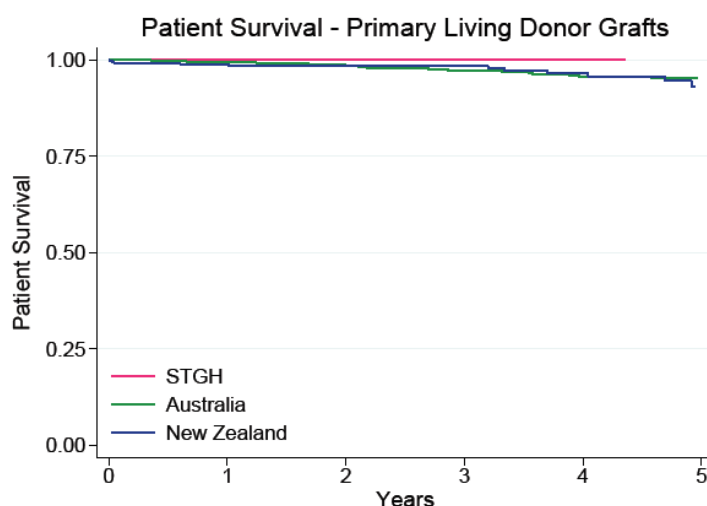


Figure 62. Patient survival - primary living donor grafts (ANZDATA Individual Hospital Report 2014-2019)

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	32	100.0	1373	100.0	438	100.0
3 months	31	100.0	1284	99.0 (98.3-99.4)	411	98.4 (96.7-99.2)
6 months	31	100.0	1235	98.8 (98.1-99.3)	387	98.2 (96.3-99.1)
1 year	26	100.0	1123	98.1 (97.2-98.8)	346	97.4 (95.3-98.5)
2 years	23	95.8 (73.9-99.4)	900	96.9 (95.7-97.7)	267	97.1 (94.9-98.3)
3 years	11	95.8 (73.9-99.4)	657	94.8 (93.2-96.0)	204	96.7 (94.2-98.1)
4 years	5	95.8 (73.9-99.4)	406	91.7 (89.5-93.5)	125	93.7 (89.8-96.2)
5 years	3	95.8 (73.9-99.4)	212	90.8 (88.4-92.8)	62	89.9 (83.7-93.8)

Table 20. Graft survival for living donor grafts (ANZDATA Individual Hospital Report 2014-2019 (Table 18))

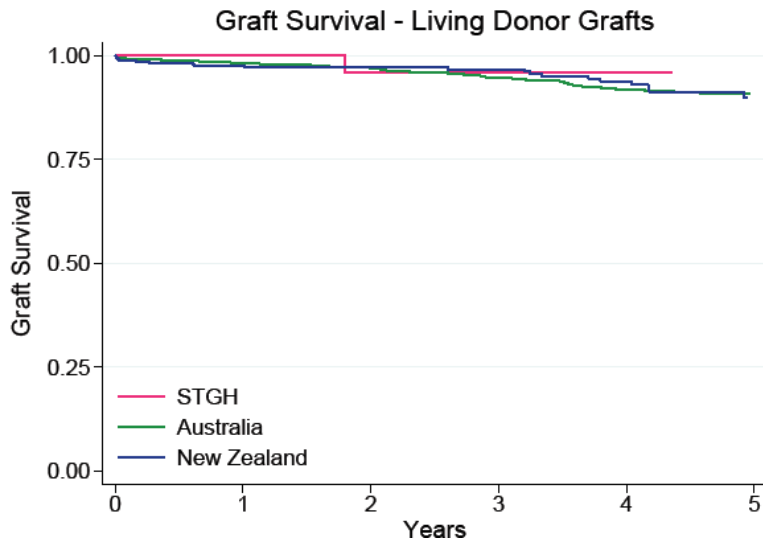


Figure 63. Graft survival for living donor grafts (ANZDATA Individual Hospital Report 2014-2019)

3. Waiting list data

KPI:

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

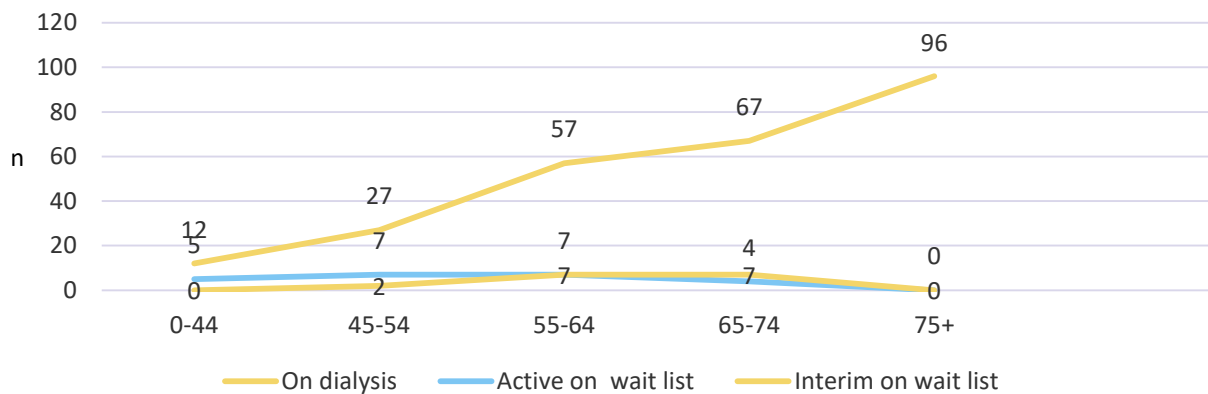


Figure 64. Number of people on dialysis and on the transplant waiting list May 2020

Although the numbers are small, the percentage of patients listed for transplant in each age group exceeds 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.

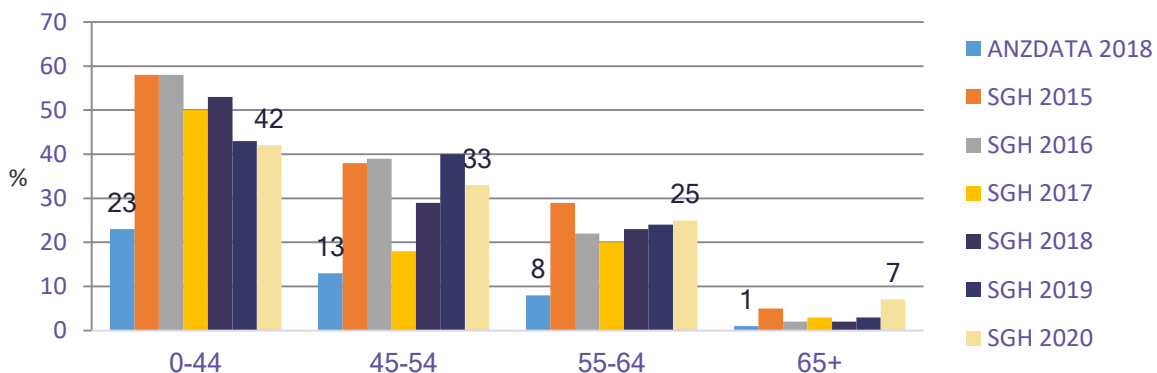


Figure 65. Percentage of SGH dialysis patients listed for transplant compared to ANZDATA 2018

4. Donor Data

KPIs:

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

At 31/12/20 there were 73 living kidney donors under the care of SGH nephrologists.

- During 2020 64 donors (86%) attended for review. One moved away and transferred care to another nephrologist. The remaining 9 were followed up by letter or phone.
- Among the donors there were no deaths and no one on dialysis.
- Creatinine ranged from 55-139umol/L, eGFR from 45->90mL/min/1.73m2 and albumin creatinine ratio from 0-7.6mg/mmol.
- Twenty seven SGH renal donors have CKD stage 3A (GFR 45-59) and 3 have CKD stage 3B (GFR 30-44).
- Eleven donors had hypertension requiring treatment, with eight requiring one agent and three requiring two.

Renal Donor patient flow

1/1/19 SGH renal donors registered with ANZDATA	71
In	
Donated	3
Transferred care in	0
In Subtotal	3
Out	
Transferred care out	1
Died	0
Out Subtotal	1
Net Gain	2
31/12/19 SGH renal donors	73

Three people under the care of SGH proceeded to donate a kidney during 2020. The process of donor assessment from referral to the coordinator to kidney donation took 19-27 weeks.

Thirty two people presented to SGH for donor assessment during 2020. One went ahead and donated in 2020. Eleven did not proceed: six due to medical reasons and five because of issues with the recipient. Thirteen potential donors did not make any progress after the initial phone call. At 31/12/20 a total of 7 people remain in the donor assessment process at SGH.

Plans for the next 12 months

- Pre-transplant education 12/2/21, 12/5/21

10. RENAL SUPPORTIVE CARE SERVICE

Frank Brennan, Kelly Li, Elizabeth Josland, Alison Smyth, Jessica Stevenson, Danielle Horne

Details of current research, guidelines, patient information, education and presentations can all be found on the Renal Supportive Care section of the Renal Department website:

<https://stgrenal.org.au/>

Due to COVID-19 restrictions the Sutherland Hospital Clinic ceased mid-year and all patients were consulted via telehealth or seen at St George Hospital

RSC Service Activity

There is an average of 4 new inpatient referrals per month

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%			1173		
2014	300	9%	99	12%	1090		
2015	268	10%	81	9%	1505	24	6
2016	305	6%	137	12%	1728	92	77
2017	281	14%	141	15%	1722	78	50
2018	366	11%	133	12%	2222	179	128
2019	349	10%	136	8%	1957	238	255
2020	499	7%	92	4%	1828	352	231
TOTAL	3981	11%	819	115	15332	963	747

Table 21. RSC Activity 2009-2020

Patient Demographics and Outcomes

Demographics of patients seen by the renal supportive care service (at their first visit/ consult) are tabled below.

	Conservative	Dialysis	Transplant	Pre-Dialysis/ undecided	Total
No. of patients (count)	668	432	39	96	1235
Age (average, years)	83	72	62	75	77
Age (range, years)	(23, 99)	(23, 94)	(33, 80)	(28, 91)	(23, 99)
eGFR (average)	16		34	27	16
Diabetes (%)	0%	0%	0%	0%	46%
IHD (%)	52%	58%	26%	42%	52%
Dementia (%)	10%	5%	0%	3%	7%
2 or more co-morbidities* (%)	75%	80%	64%	77%	77%
Current or former smokers (%)	15%	31%	21%	14%	21%

Table 22. Patient demographics on first visit/ consult 2009-2020

Inpatient services

- Inpatients are predominantly seen by the CNCs. The majority of new inpatient referrals continue to be for pain and symptom management.

Outpatient services

- There were a higher number of Telehealth consults due to COVID-19 restrictions. These consults assist patients who are too frail to physically attend the clinic and to manage patients who require frequent follow up.

Palliative Care Outcome Scale Clinic outcome

- Symptom surveys are conducted at each RSC Clinic visit. The most prevalent symptoms reported as severe/ overwhelming were lack of energy, poor mobility, pain, difficulty sleeping and itch.
- Of all patients that have been seen in the RSC Clinic since 2009, 58% had a reduction in their total symptom score by the 3rd clinic visit.
- 26% of patients with at least 3 visits reported severe/ overwhelming pain at their first visit, 72% had a reduction in their scores by visit 3.

Advance Care Plans

Advance care plans are standard practice within the clinic, this includes yearly reviews. The chart below shows figures for patients as of Dec 2020.

- 66% of non-dialysis patients attending the RSC clinic that are competent had an advance care plan. This is lower than previous years as the ability to complete ACPs were impacted by an increase in telehealth consults due to COVID-19.

NFD - RSC clinic	82
With ACP	39
Without ACP - Suitable	20
Discussed	4
ACPs to do	16
Without ACP- not suitable	23
<i>Unable due to Dementia/ Incompetent/ Social</i>	2
<i>Nursing home patients</i>	3
<i>Less than 3 Clinic appointments</i>	12
<i>Lost to follow-up -Not seen >2yrs</i>	6
% Completed	66% (39/59)

Research, Publications, Teaching and Presentations

Research

- Dialysis/transplant symptoms: investigate and compare the symptom burden of dialysis and transplant patients
- Incidence of frailty and malnutrition in advanced chronic kidney disease: a comparison of conservatively-managed and dialysis-dependent patients
- Quality of Life: To determine the QOL of RRT patients and to determine if there is a relationship between QOL, specific biochemical markers, dialysis adequacy, age and diabetic status.
- Dialysis Symptoms: Determine if there is improved symptom scores in ESKD patients on dialysis after attendance at RSC clinic
- Prevalence of Taste Changes in patients with end stage kidney disease
- Pathophysiology and management of taste changes in CKD
- CKD managed without dialysis: survival symptoms and QOL
- The influence of Advance Care Plans in clinical care during hospitalisation

Publications

- Dawson J, Hoffman A, Josland E, Smyth A, Brennan F, Brown, M. Evaluation of health literacy in end-stage kidney disease using a multi-dimensional tool. Renal Society of Australasia Journal. 2020; Vol.16(2), p.36-43
- Brennan F, Stevenson JK, Brown MA. The pathophysiology and management of taste changes in chronic kidney disease: A Review. Journal of Renal Nutrition. 2020; 30(5); 368-379
- Dawson J, Brennan F, Hoffman A, Josland E, Li Chenlei-Kelly, Smyth A, Brown MA. Prevalence of taste changes and association with other nutrition-related symptoms in end-stage kidney disease. Journal of Renal Nutrition. 2020
- Brennan F. Spirituality, Poetry and Palliative Care. The Blog of the European Association for Palliative care. Published February 17, 2020 [Spirituality, poetry and palliative care | EAPC Blog \(wordpress.com\)](#)

Education Days and Teaching

- The Combined St George Hub meeting was held online on 12 November. This day included updates and presentations from multiple Hub renal departments resulting in productive discussion valuable future planning for the service moving forward.

Presentations

- Jessica Dawson was invited to present at a national professional development network day for dietitians “Identifying and managing chronic kidney disease in primary care”
- Jessica Dawson was invited to present online Education in Nutrition “Conservative (non-dialysis) management of advanced CKD: nutritional priorities and symptom management”
- Jessica Dawson was invited to present at Food solutions education day (this is a dietetics company that provides nutrition services to aged care facilities) “Dietary management of CKD in the elderly”
- Jessica Dawson presented at ERA-EDTA (European Renal Association-European Dialysis and Transplant Association Virtual conference, June 2020): 10 minute oral presentation -

“Evaluating the feasibility and impact of a mobile phone text messaging intervention on adherence to dietary recommendations in people receiving haemodialysis (KIDNEYTEXT)

- Jessica Dawson did 3 oral presentations at ANZSN (1 presentation as finalist for Young Investigator of the Year award)
- Dr Frank Brennan gave multiple online presentations in 2020, including national and international conferences, lectures and teaching sessions
- Dr Brennan gives a series of half-hour tutorials on all aspects of RSC to the junior doctors in the Renal Department.
- Elizabeth Josland and Alison Smyth provided multiple in-services for new ward staff.

Networks

- All team members continue to be involved in various local and state-wide network groups.
- Elizabeth is a co-chair on the Agency for Clinical Innovation(ACI) LBVC Renal Supportive Care (RSC) Working Group

Achievements for 2020

- Jessica Dawson submitted her PhD in November 2020
“A Text Messaging Intervention for Dietary Behaviours for People Receiving Maintenance Haemodialysis: A Feasibility Study of KIDNEYTEXT”
- Jessica Dawson was a finalist for ANZSN Young Investigator of the Year award
- Dr Brennan was awarded a Member of the Order of Australia (AM) and an article was written about this in the St George and Sutherland Shire Leader on January 26th, 2020.

Performance indicators and outcomes for 2020

1. Symptom and functional state assessment in clinic

100% of patients had an IPOS (renal) symptom survey and Karnofsky performance scale measured in the RSC clinic on each visit. These assessments are used to identify individual issues and monitor change.

- 64% of patients (conservative and dialysis) had an improvement or maintained their total symptom score between first and third visit to the RSC clinic
- 65% of patients (conservative and dialysis) had an improvement or maintained their functional status between first and most recent visit to the RSC clinic

2. Symptom assessment in dialysis

All dialysis patients have an IPOS (renal) symptom survey and Karnofsky performance scale measured every 6 months. These clinical tools are used twice a year for each patient to monitor progress and identify issues.

- Patients with severe or overwhelming symptoms have automatic referral to the renal supportive care service. Patients can be seen on dialysis or are called to arrange an appointment.

3. Advance Care Plans

100% of competent and consenting ESKD patients who are not for dialysis and are seen in the RSC clinic, or those who are currently on dialysis but their treating physician has identified that they would “not be surprised if they died in the next 12 months”, should have an advance care plan completed and reviewed every year.

- 66% of competent NFD patients who are seen in the RSC clinic have an ACP.
- Of the 62 dialysis patients identified as requiring an ACP in 2020, 57% (n=32) had an ACP completed. Each year nephrologists are sent a list of their current dialysis patients to identify those requiring an ACP (identified using the “Surprise Question”).

4. Nutritional assessment

- 66% of RSC dietetic consultations were for patients attending for conservative management, with 100% of conservative patients being reviewed one or more times in clinic
- 34% of RSC dietetic consultations were for patients attending for symptoms support (e.g. pre-dialysis, dialysis-dependent, transplant), with 99% of symptom support patients being reviewed one or more times in clinic

11. HYPERTENSION

George Mangos, Jennifer Beddoe

Twenty four hour ABPM monitoring

2020 was a challenging year, due to COVID 19 for the 24hr ABPM service. Despite the challenges two hundred and fifty nine ABPM's were conducted, with only sixteen of these were for research and the remaining two hundred and fifty three were for clinical purposes.

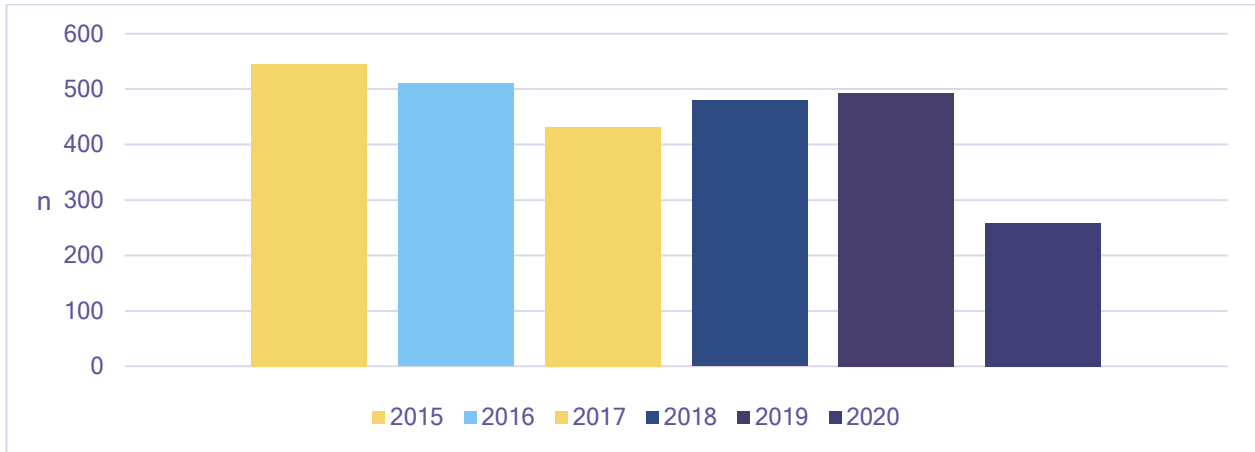


Figure 66. Total number of ABPMs 2015-2020

Home monitor checks

During 2020 thirty four home monitor checks were performed. Activity was also affected by COVID 19

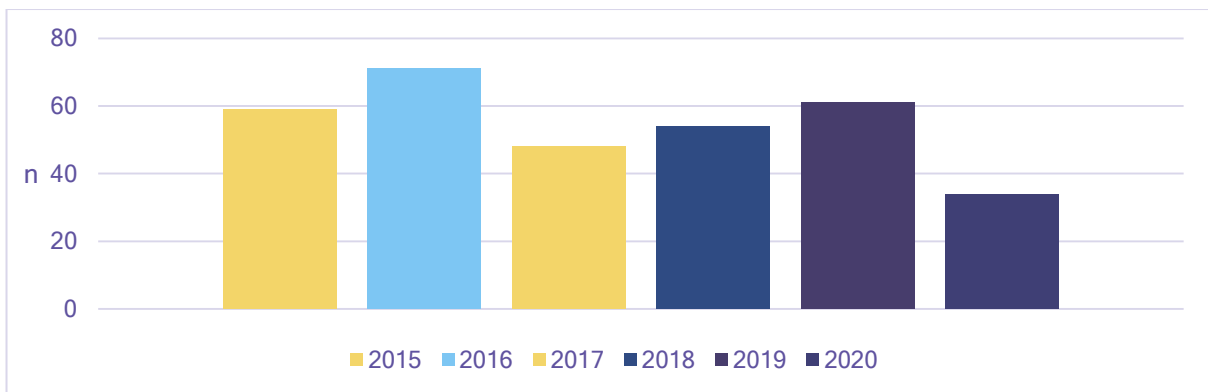


Figure 67. Home Monitors 2015- 2020 Activity

Hypertension studies

Our unit is participating in two hypertension studies. The SPYRAL-ON RCT is evaluating the role of renal denervation in patients with hypertension on 1-3 medications, our unit is one of 3 Australian centres. The PROSALDO trial is examining new diagnostic methods for Primary Aldosteronism. Both of these were delayed due to COVID 19. The end of the year saw these studies been recommenced. Two thousand twenty one will see the launch of the Hypertension Research Clinic.

12. HYPERTENSION IN PREGNANCY

Franziska Pettit, Jennifer Beddoe

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

Activity

- In 2020 there were 2206 births at St George Hospital, down from 2442 in 2019. 212 (10%) of these were complicated by a hypertensive disorder. 6 were twin pregnancies and were excluded from this analysis. In 2019 the Australian Mothers and Babies report the overall rate of hypertension in pregnancy was 4.8%.
- Of the 206 singleton pregnancies in 2020 171 (81%) were consulted to the renal team. The remaining 41 (19%) were managed by the obstetric team.
- One woman suffered an eclamptic seizure.
- There were no episodes of pulmonary oedema, dialysis or maternal deaths during 2020 here at St George.
- There were 3 instances of fetal demise.
 - 1 neonate delivered at RHW at 25+6/40 and died at 2 weeks of age,
 - 1 instance of placental abruption at 39/40weeks which was attributed to pre-eclampsia (PE)
 - 1 Medical termination for PE at 22/40 weeks.
- Treatment for severe HT has changed from Nifedipine 10mg stat to Labetalol 200mg stat due to Nifedipine 10mg no longer being available.
- The Obstetric Medicine Clinic (OMC) saw a decrease in occasions of service. This may be due to the decrease in the number of births at St George in 2020 or related to the COVID-19 pandemic.

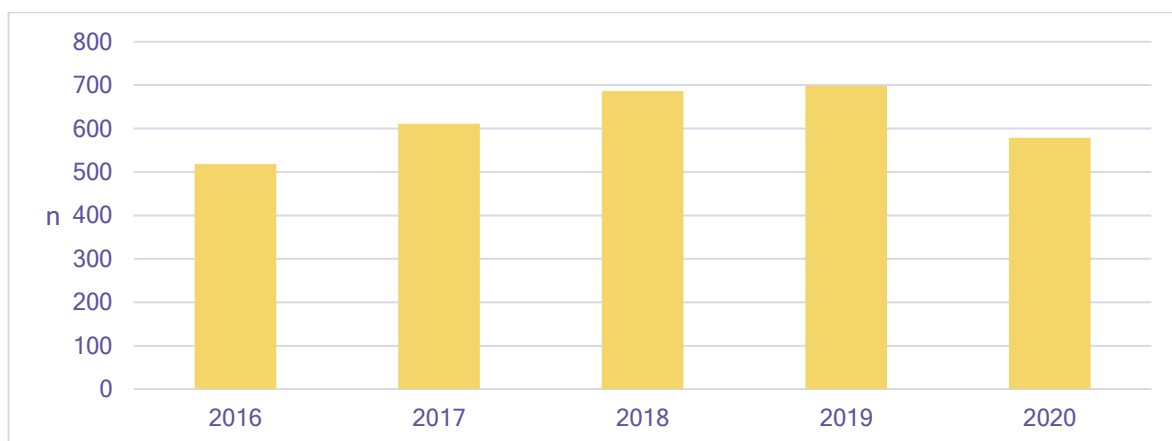


Figure 68. OMC occasions of service 2016-2020

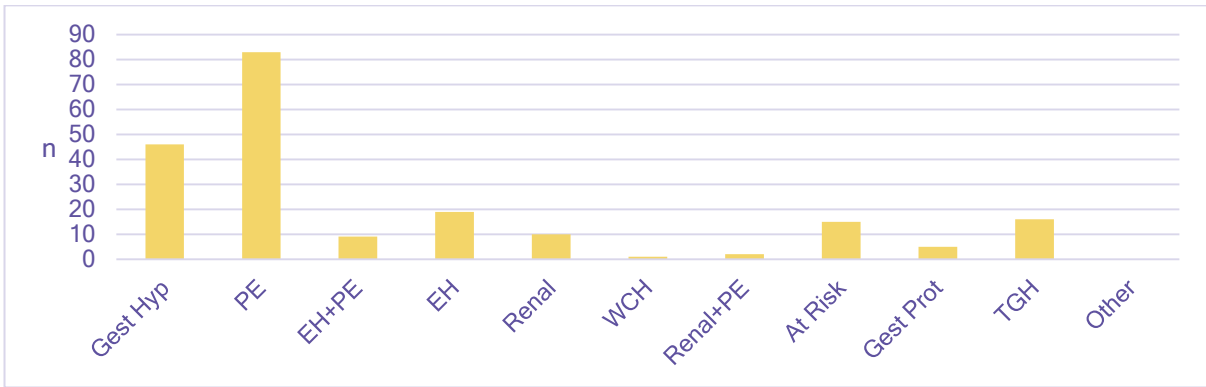


Figure 69. Diagnosis 2020 breakdown

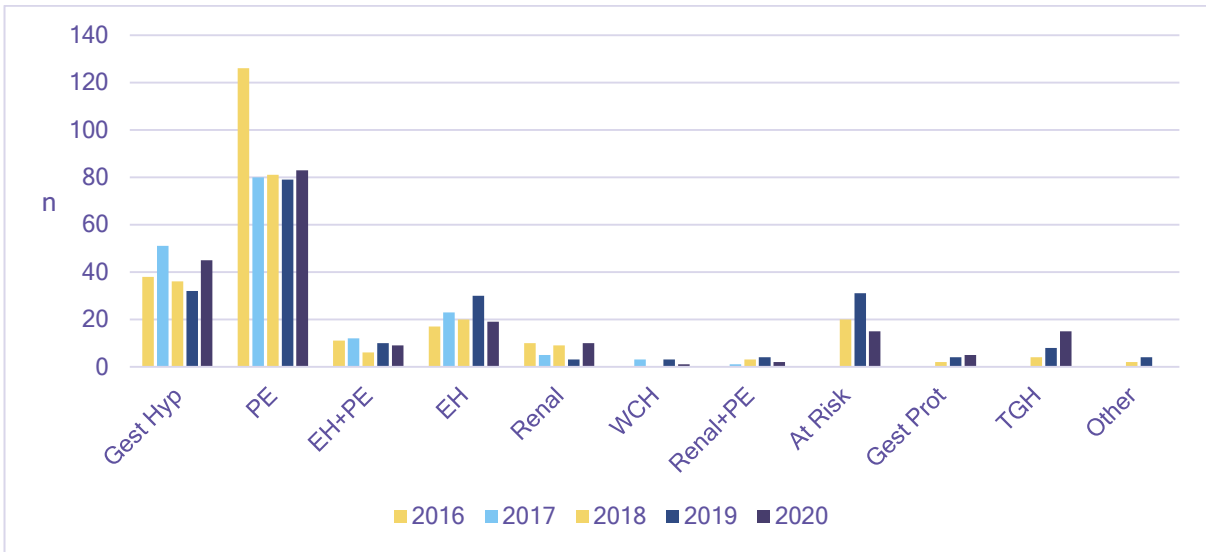


Figure 70. Diagnosis comparison 2016-2020

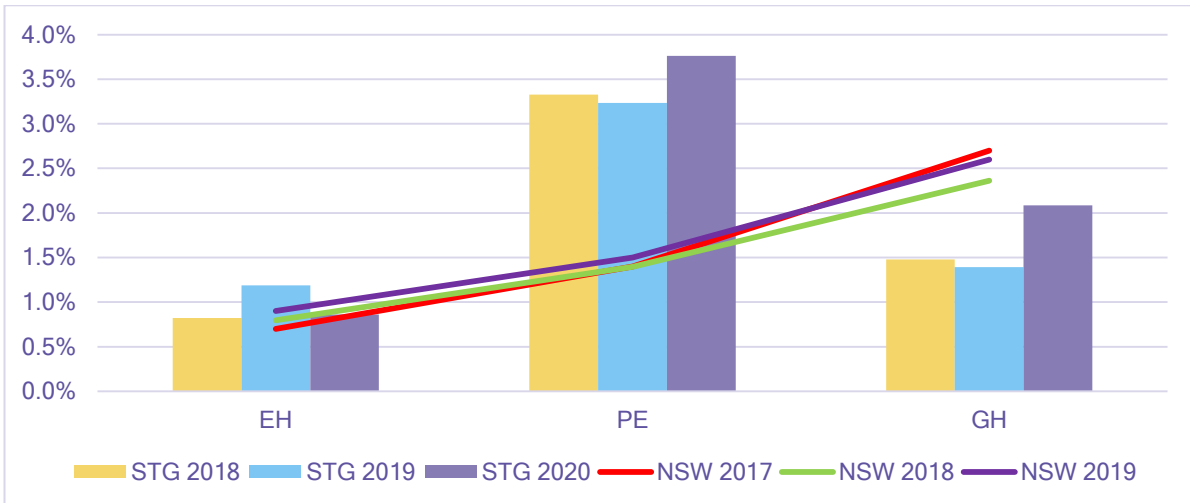


Figure 71. Diagnosis comparison NSW to STG taken from Mothers and Babies NSW

Conclusion

The OM team continue to provide a medical service and active research profile to the Obstetric service at STGH. The number of births have dropped from 2442 in 2019 to 2203 in 2020, and our team is consulted on 10% of these cases.

13. RENAL BIOPSY REVIEW – AUDIT OF COMPLICATIONS

Partha Shanmugasundaram

	Total	Transplant biopsies
Number	115	26
Total complications	9 (7.8%)	1 (3.8%)
Macroscopic haematuria	5(4.3%)	1 (3.8%)
Symptomatic Perinephric haematoma	5(4.3%)	1 (3.8%)
Transfusion	1 (0.9%)	None

Comparison of total complication rates from previous years

	2013	2014	2015	2016	2017	2018	2019	2020
Total Number	118	123	98	134	126	127	125	115
Complication rate	5.1%	6.5%	12.2%	5.2%	7.1%	3.9%	6.4%	7.8%

Comparison of specific complication rates expressed as percentage (number)

Year N	2016 N=134	2017 N=126	2018 N=127	2019 N=125	2020 N=115	Last 5 years N=618
Total complications	5.2(7)	7.1(9)	3.9(5)	6.4(8)	7.8(9)	6.1(38)
Macroscopic Haematuria, %(n)	3(4)	2.3(3)	3.1(4)	3.2(4)	4.3(5)	3.2(20)
Perinephric Haematoma, %(n)	1.5(2)	3.2(4)	0.8(1)	3.2(4)	4.3(5)	2.6(16)
Perinephric bleed – angioembolisation, %(n)	0(0)	0(0)	0(0)	0(0)	0.9(1)	0.2(1)
Required blood transfusion	0(0)	0(0)	0(0)	1.6(2)	1.7(2)	0.8(4)

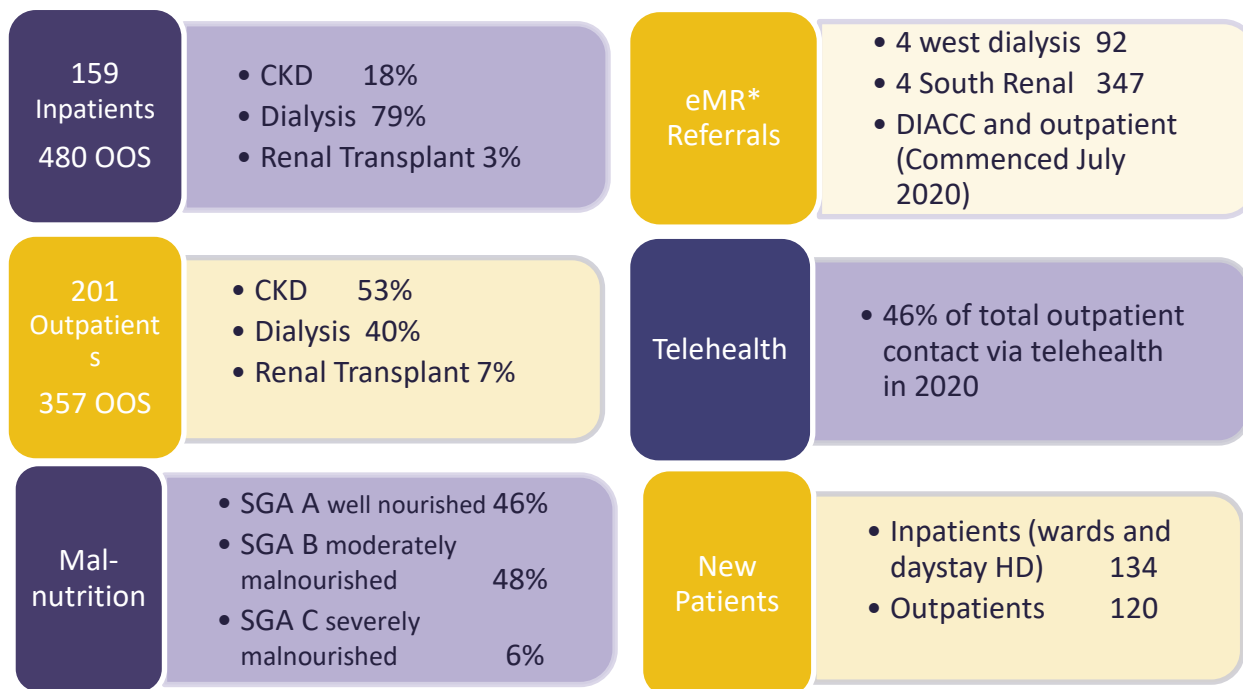
Our benchmarks (Am J Kidney Dis 60(1):62-73. 2012) are:

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

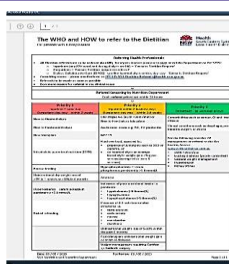
The rate of all complications over the last 5 years was 6.1%. This seems to be stable and in keeping with the rates noted in the international literature and in standard practice, although higher than our benchmark. The complications related to individual patients are discussed in the departmental annual audit meetings to identify issues which can be optimised to reduce complication rates.

14. NUTRITION SERVICES

Maria Chan, Caitlin Delaney and Samantha Furka. Please refer to RSC for Jessica Dawson



eMR referrals for outpatient services accounted for ~ 40% total referrals as the additional referrals were related to dietitian(s) by email or fax, or letters, e.g. from SGH clinics after the appointment encounter was closed, nephrologists' consulting rooms and specialty clinics - Pre-Dialysis Education Clinic (PDEC) and Acute transplant. In addition, structured eMR referral for outpatient and day-stay areas commenced ~July 2020 after the implementation of the updated referral criteria (see below)



Efficiency Strategies

- Updated referral criteria (<https://stgrenal.org.au/guidelines-and-policies/guidelines/nutrition-and-dietetics/>)
- eMR - dietitian appointment books in PDEC & Acute Transplant clinics
- Use of Dietitian Assistants - 11% of total inpatient OOS under Nephrology
- Use of tele-health for follow-up/intervention

Key Achievements

- **Quality Improvement**
- Review of the nutrition and dietetic service to renal transplant patients (see below)
- Determined patient preferences for dietetic follow up dialysis patients attending the Dialysis Collaborative Care (DIACC)
- **Research**
- Determining what nutritional outcomes matter to patients with non-dialysis dependent chronic kidney disease

Work in Progress

- Reviewing the use of the haemo- and peritoneal dialysis diet codes (for inpatient meal ordering), impact on oral intake and patient experience on 4 South
- Finalising the Intradialytic parenteral nutrition (IDPN) Clinical Business Rule
- Evaluation of CKD nutrition intervention and services (DAMPER study)
- Establishing pre-and post-transplantation assessment and follow-up

Future Directions

- To pilot virtual group education sessions or virtual class room (to complement individualised advice)
- To further develop and evaluate structured nutritional care incorporating precision medicine and tel-health
- To pilot Dietitian Assistant services in 4W HDx centre for nutrition screening and ongoing nutrition support

Service type, referrals and dietitian staffing level:

Year 2000		Non-dialysis dependent CKD	RRT					Total	Current Staffing (FTE)
			Home HD	HD 4W- In-centre	DIACC	PD	TP		
Outpatient/day-stay patient	New For Dx- including new on Dx , change modality, new t/f from other unit)	~93 (~78 from pre-dialysis education clinic (PDEC) + ~15 (direct referral from MO to Renal Nutrition Clinic, Dept. of Nutrition & Dietetics)	~6	44	20	17	13	193	1.0
	* Total at any time point	~140 (~115 from PDEC)	37	66	80	40	220	583	
	Short term & <i>ad hoc</i> intervention (e.g., stones, HT)	~10						~10	
Inpatient (as per eMR referrals)			eMR referral					347	0.6

* **Remark:** this denotes the total number of patients who should be reviewed regularly and for long term follow-up as per best practice guidelines

- Current dietitian staffing for non-admitted (outpatient) + day stay HDx, dietitian: patient ratio – 1:600 (MC) or ~ 1.0 FTE at SGH for the estimated clinical load of ~ 3.3 FTE dietitian OR 1.6FTE dietitian for 3.9 FTE's total workload according to the Dietitians Association Renal Dietitians Workforce Recommendation: \\sesahs\chn\STG\Renal RISCDOC\Nutrition and Dietetics\Resources\Renal-Dietitians-Workforce-Recommendations 2018.pdf.
- These data suggested minimal contact time, not including re-referrals for new issues.

Nutrition in Renal Transplant Recipients (2014-2018) audit – thanks for the involvement of Nicole Getreu, Senior Clinical Dietitian

Aims

- Profile and track the patient journey of SGH renal transplant recipients including dietetic involvement in the pre and post-transplant phase
- Compare to evidence/guidelines
- Develop a clinical pathway for nutritional management

Results (selected)

	Since Transplant (1-4 years)	In first year post transplant
Data available (n)	85	79
Gained weight (n, %)	56 (67%)	51 (65%) (Range 42-61%)
Ave gain (Range)	7.8kg/7.4% (0.8-20kg)	6.5kg/8.9% (0.8-19.4kg) (Range 10-35%)
Lost weight (n, %)	26 (31%)	-
Ave loss (Range)	4.4kg (0.5-18kg)	-
Net change	3.8kg gain	2.7kg gain

Recommendations

- To further investigate if the above mentioned levels of weight gain were desirable or undesirable
- To review clinical pathway: additional scheduled reviews at 6 and 12 months (to be finalised)
- Implemented, trialed and audited, evaluated within two years
- Consider patient related outcome measures
- Renal transplant dietitian to focus on acute and subacute phase, and after 12 months post-transplant, refer to alternative services for best use of resources

15. SUSTAINABILITY INITIATIVES

Brendan Smyth, Franziska Pettit

Staff at St George Hospital have been investigating ways to reduce water consumption at the dialysis unit. Fresenius and hospital engineering and plumbing staff have been consulted and a working group established.

The main focus of the project is to determine the feasibility of reusing reject water from the reverse osmosis (RO) machine. The RO, and associated purification equipment, transforms ordinary mains water into ultrapure water, which is then piped to the dialysis unit for mixing into dialysate. The process of producing one litre of ultrapure water requires approximately three litres of mains water – and so results in two litres of waste water (or reject water). This water is no longer chlorinated and has a slightly higher concentration of dissolved salts than the original mains water, but remains clean and is safe to drink. There are many potential uses for this water.

The outcomes of the working group to date are:

1. Quantifying the volume of reject water from the RO as approximately 25,000L per week (or 1.3 million L per year)
2. Testing the RO reject water at an accredited water testing laboratory. No contaminants were found.
3. Identifying the most likely use of reject water as flushing toilets within the main block of the hospital
 - a. The RO is located near the flushette tank – which stores water directed to toilet flushing.
 - b. An intermediary storage tank and pump are required, along with piping, to direct the reject water from the RO to the flushette tank.
 - c. Chlorination of the RO reject water is not required as the flushette tank (with a volume of over 10,000L) is emptied approximately twice per day (meaning that the flushette tank water is not stagnant and mains water chlorine concentration will be only moderately diluted by the addition of RO reject water)
4. Identifying the potential to save water and energy by narrowing the time which the RO is running and/or reducing the number of heat disinfection cycles.

Ongoing activities are:

1. Drafting a cost estimate for installation of the required pipes, pump and storage tank for diverting RO reject water to the flushette tank.
2. Confirming the safety of reducing the number of heat disinfection cycles, which will be followed by a reassessment of RO run times. If changes in the run times appear feasible, then linking the RO to the IT network will be considered so that the dialysis unit has the flexibility to turn on the RO directly from the dialysis unit, which may permit tighter automated on-off times.

Additional initiatives implemented by the department include:

- PVC recycling to commence on 4w, 4s, 5w and PD.
- Twice weekly bloods which we continue to reinforce with our staff – hospital wide initiative.
- Revisiting the paperless pathology ordering with the DCS