2014

ANNUAL REPORT AND QUALITY INDICATORS

Department of Renal Medicine
St George & Sutherland Hospitals

Health
South Eastern Sydney
Local Health District

This is the 2014 annual report for the Department of Renal Medicine at St George and Sutherland Hospitals. We produce this report annually partly to disseminate the outcomes of our work to others but also to provide a platform for meaningful discussion within our department as to whether we are achieving the high standards of patient care that we seek.

In general, we have met the high standards we set and we have identified a couple of areas for improvement. We have a busy clinical load, now ranked 5th out of 28 Renal Units for ESKD activity in NSW. We also provide extensive hypertension services, including hypertension in pregnancy, and have pioneered a Renal Supportive Care service that is now being extended state-wide. I am pleased that we have also been able to maintain high involvement in undergraduate and postgraduate teaching and research.

I would like to thank every member of our staff for the contributions they have made to the clinical, organisational, societal and academic sides of our department.

Many companies have supported our clinical teaching in 2014 with untied support and we appreciate the support from:

- Alexion
- Amgen
- Aspen
- Baxter
- Boehringer-Ingelheim
- Novartis
- Pfizer
- Roche
- Sanofi
- Shire

I hope you find the report of interest. As always we welcome feedback.

Mark Brown
Director, Dept. Renal Medicine
St George & Sutherland Renal Services

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1. EXECUTIVE SUMMARY

The following pages highlight the key findings from our report. In brief, we are meeting most of our targets and exceeding several, including our very low peritoneal dialysis and haemodialysis infection rates. We have demonstrated good patient survival for all dialysis and transplant patients, and have been able to control or improve symptoms well for patients on a non-dialysis pathway. Preparation for dialysis through our pre-dialysis education program is increasingly successful and the vascular access program continues to improve, now achieving primary access at a higher rate than the national average. Pleasingly, there is positive feedback about our range of teaching programs.

Some areas for review identified from this report include deceased donor graft survival, peritoneal dialysis failures (non-infective) and planning for subsequent haemodialysis, and an improved credentialing process for renal biopsy performance.

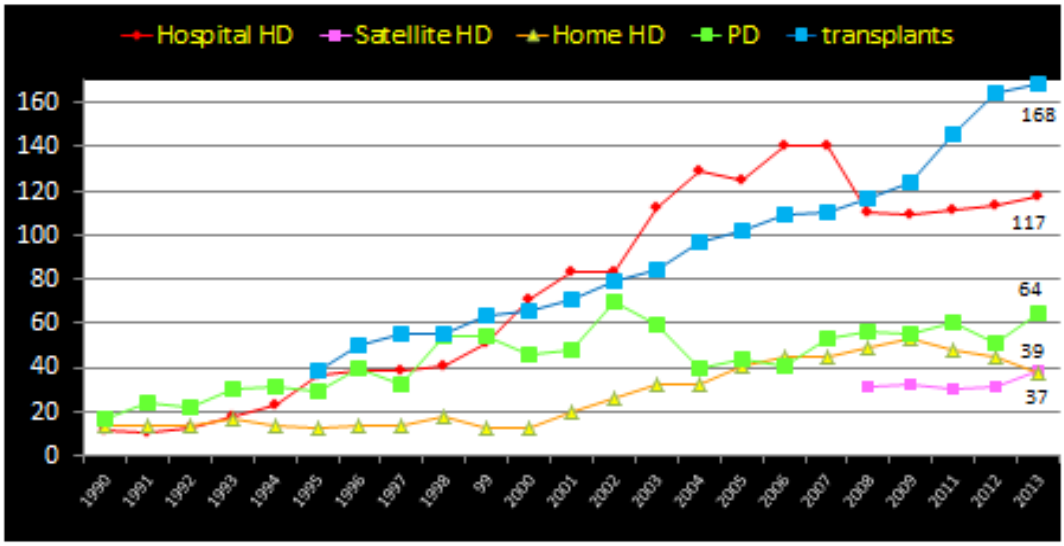
Details follow below:

Clinic and Dialysis Activity

4 West Clinics	3884
Pre-Dialysis Clinics	171
VAN outpatient	529
4 West DIALYSIS SESSIONS	
In-centre chronic	7825
In-centre acute	1334
Minimal Care	9215
Home training	394
Total	**18768**
Satellite DIALYSIS SESSIONS	6122
Other Renal Clinics	**1082**
Obstetric Medicine Clinic	**434**
TSH Renal Clinic	514
TSH Renal Supportive Care	44

A very large proportion of outpatient work is done privately and this will need to be developed further to assist workload in the future.

Dialysis & transplant patients St.George hospital 1990-2013



ANZDATA 31/12/13

Patient Flow Across NSW

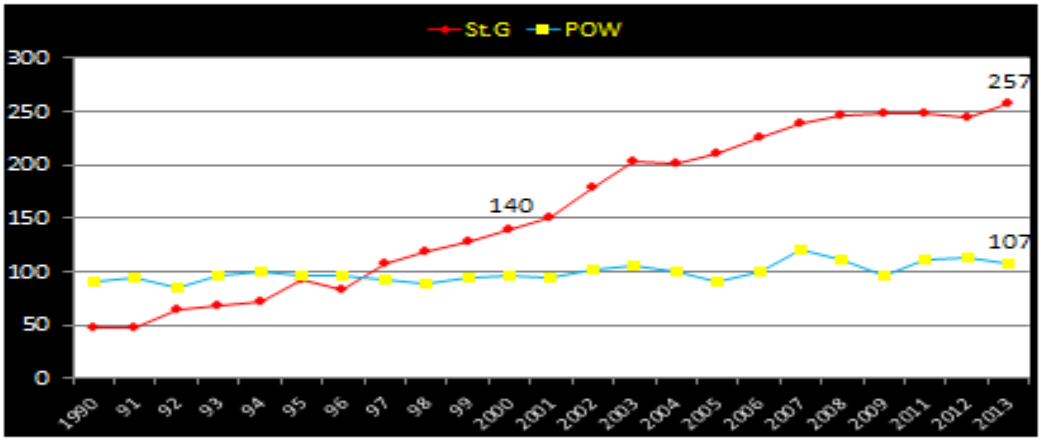
Patient flow = dialysis + (caring hospital) transplants – deaths

- Westmead 1054
- State –Wide Renal Service 996
- South West
  - Liverpool + Bankstown + Lidcombe 860
- John Hunter 592
- St George 463

- 5th out of 28 Renal Units in ANZDATA

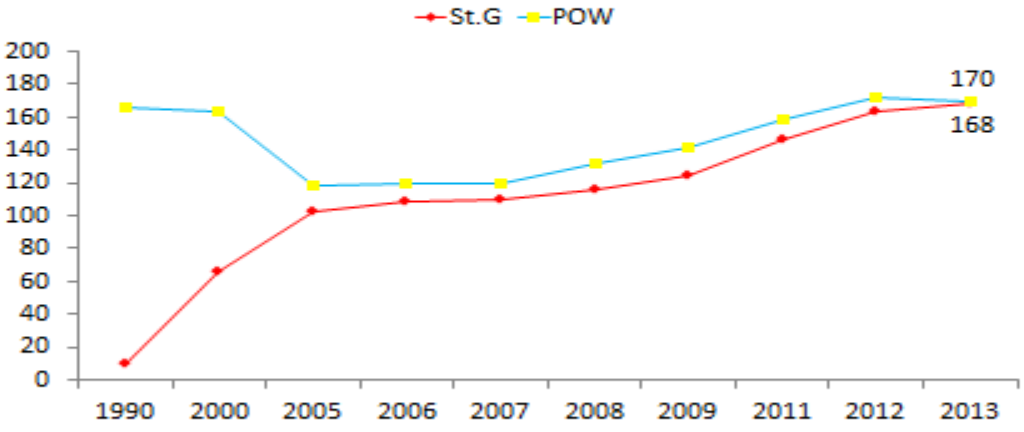
ANZDATA Dec 2013

Dialysis patients South East Sydney LHD



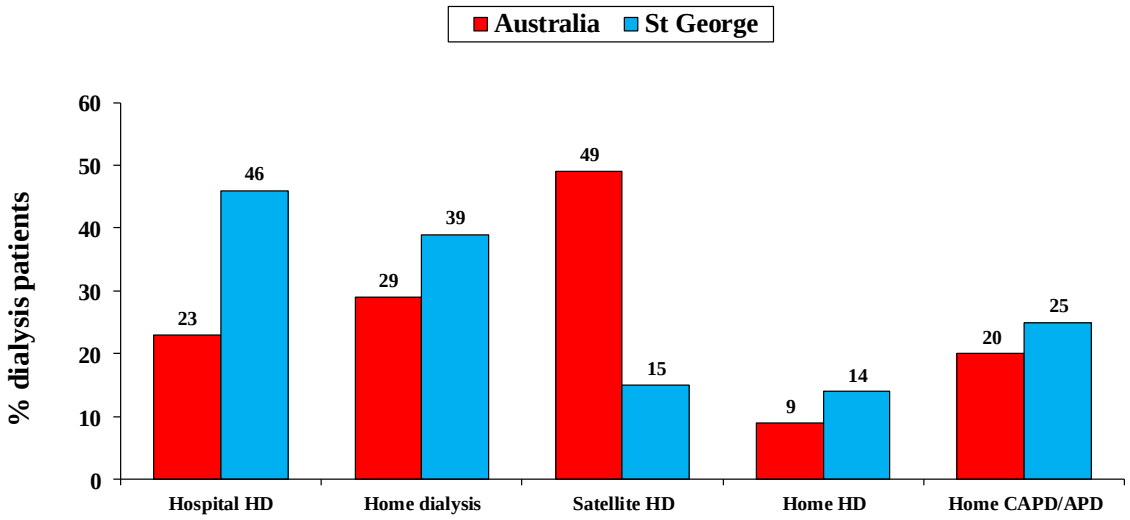
ANZDATA

Functioning Transplants South East Sydney LHD



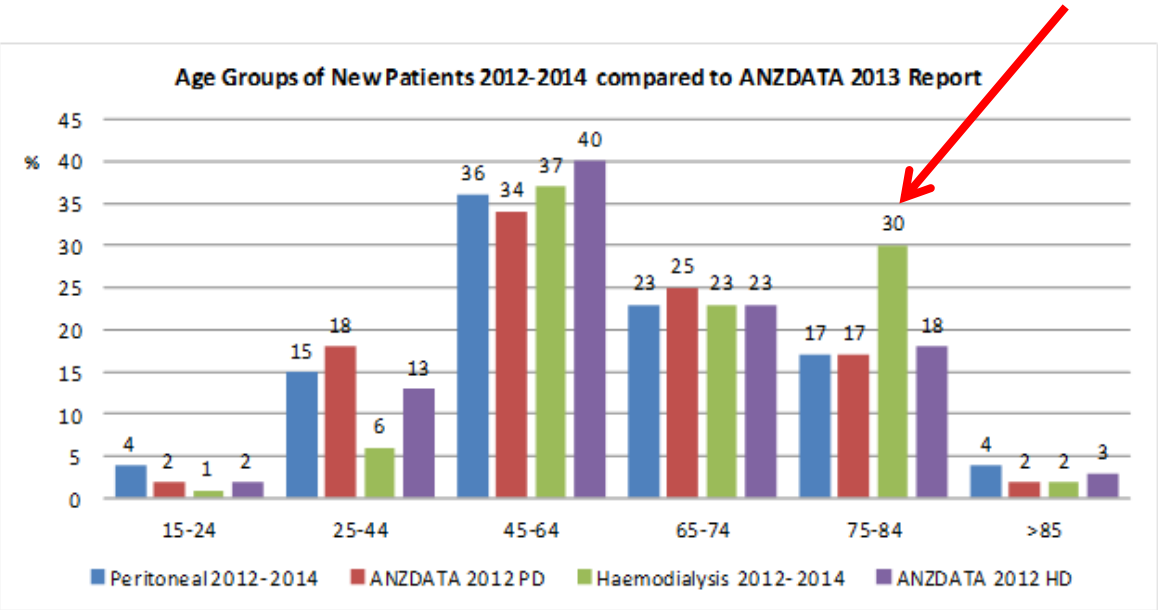
ANZDATA

Mode of Dialysis Australia and St George 2013

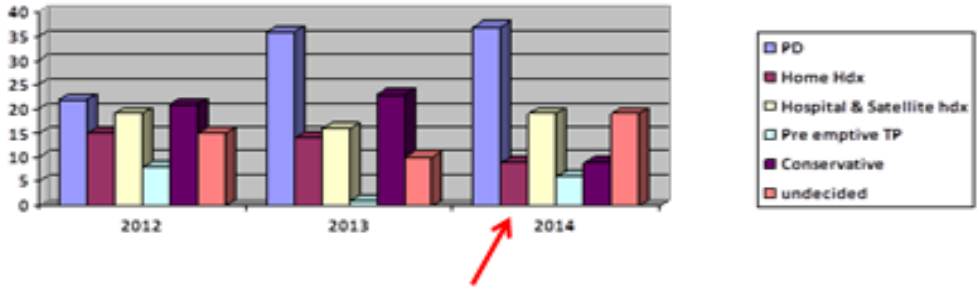


New Patients 2014

- 51 new patients started dialysis in 2014
  - 20 PD & 31 HD; Less than 15% had eGFR above 10 ml/min.
  - Co- morbidities similar to ANZDATA but age of HD older



Pre-dialysis Program – planned pathway



Only 3/8 planned home HD ended up on home HD

KPIs.

1. 73% (target 100%) of patients were referred with an eGFR ≥ 15; excludes late referrals
2. 80% (target 70%) started the planned dialysis choice
3. 92% (target 80%) of new dialysis patients (excluding late referrals) had pre-dialysis education or review within 12 months before dialysis commencement.
4. 30% (target 60%) starting RRT had vaccinated Hep B immunity

Pre-dialysis - Discussion issues

1. Meeting most benchmarks
2. Older age starting HD than National average
3. Sub-optimal starting of planned home HD on that modality
4. How to improve Hep B immunity
    1. Add data re 'non-responders' and HepB cAb positive next report

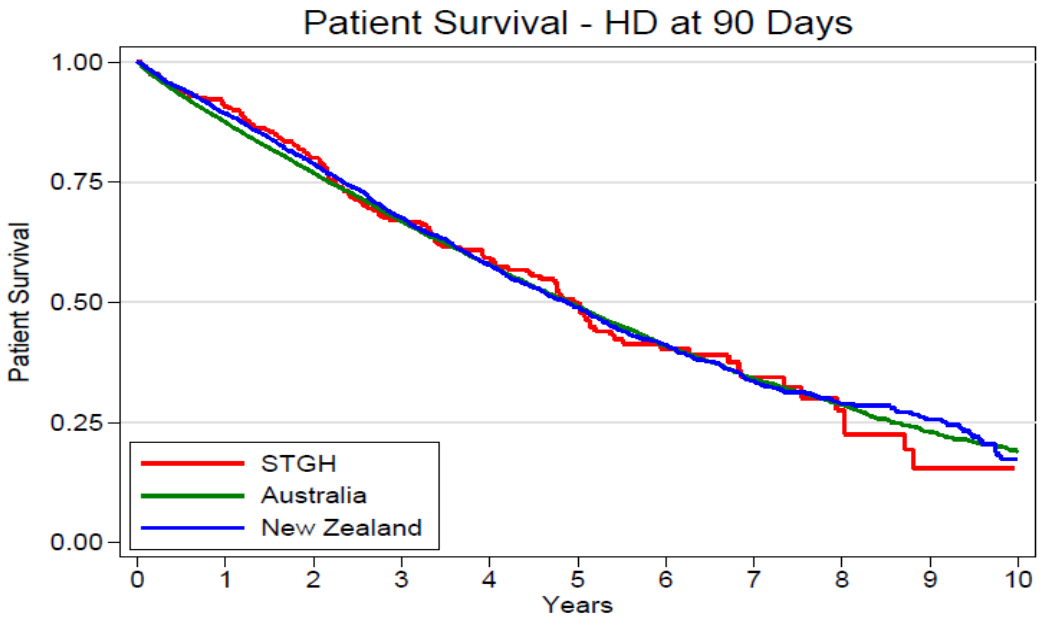


Table 3: HD patient survival

	STGH		Australia	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)
0	330	100.0	15739	100.0
1 year	248	90.8 (86.9-93.5)	11547	87.5 (86.9-88.0)
2 years	189	80.1 (74.9-84.4)	8372	77.0 (76.2-77.7)
3 years	135	67.2 (60.9-72.7)	5963	66.9 (66.0-67.7)
5 years	70	49.9 (42.7-56.7)	2780	49.3 (48.2-50.3)
10 years	1	15.5 (6.6-27.7)	75	19.0 (17.2-20.9)

Hemodialysis

- *Patient survival as good as National average* with no excess mortality
- Good Ca/PO4 and Ferritin outcomes compared with National data
- Only 31% had >15 hrs. HD per week (National 36%)
  - ? Pressure on HD staff to fit in patients
  - 41/42 home HD had >15 hrs. per week.

Duration (hours)	St George Hospital	Sutherland Hospital
< 4	0	1
4	49	16
4.5	28	14
5	32	15
5.5	1	1

- Consistent 12% had Hb <100 : need to audit this group as to why
- Only half of diabetics had HbA1c <7% - rest above or missing data.

Vascular Access

- The key performance measures for vascular access are:

1. >46% patients commencing haemodialysis with a functioning access (ANZDATA 2013)
    - Achieved 61%; achieved 77% excluding late referrals;
    - 40 days referral to access creation; 7 months to 1st use.
2. >78% of prevalent patients dialysing through a native fistula (ANZDATA 2013)
    - Achieved 83%;
3. <10% of prevalent patients dialysing through a permanent catheter (KDOQI 2006)
    - Only 3% permanent tunnelled vascath
4. <1% fistula infection rate during the useful life of the access (AVF) (KDOQI 2006)
    - Achieved 0% (home HD data unknown)
5. <10% fistula infection rate during the useful life of the access (AVG) (KDOQI 2006)
    - Achieved 0% (home HD data unknown)
6. >3.0 years AVF patency and 2.0 years AVG patency (KDOQI 2006)
7. <0.25 episodes/pt-year at risk for fistula thrombosis (KDOQI 2006)
    - Target achieved 0.09 episodes
8. <0.5 episodes/pt-year at risk for graft thrombosis (KDOQI 2006)
    - Target NOT achieved 0.84 episodes
9. <1.5 episode/1000 catheter days tunnelled catheter infection rate (KDOQI 2006)
    - Achieved target 0.22 episodes
    - Vascaths in 21% chronic patients at some point – increasingly due to transfer from PD

Peritoneal Dialysis

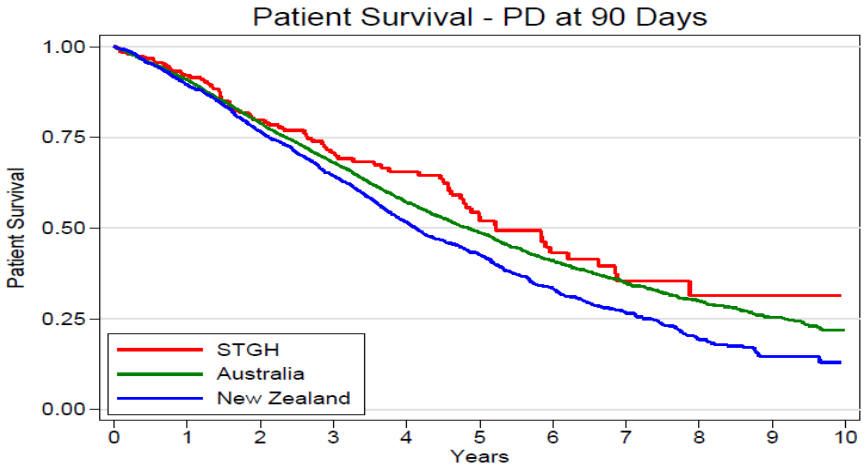
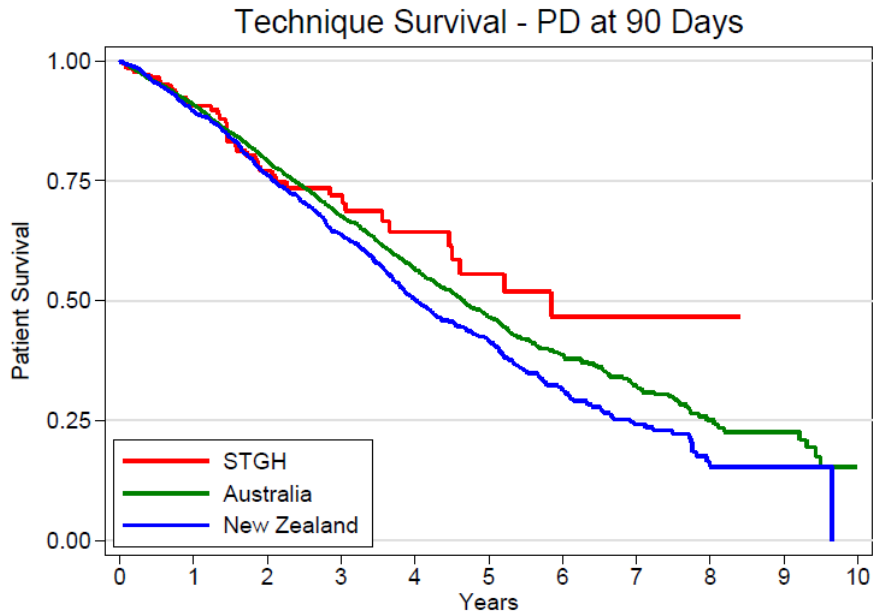


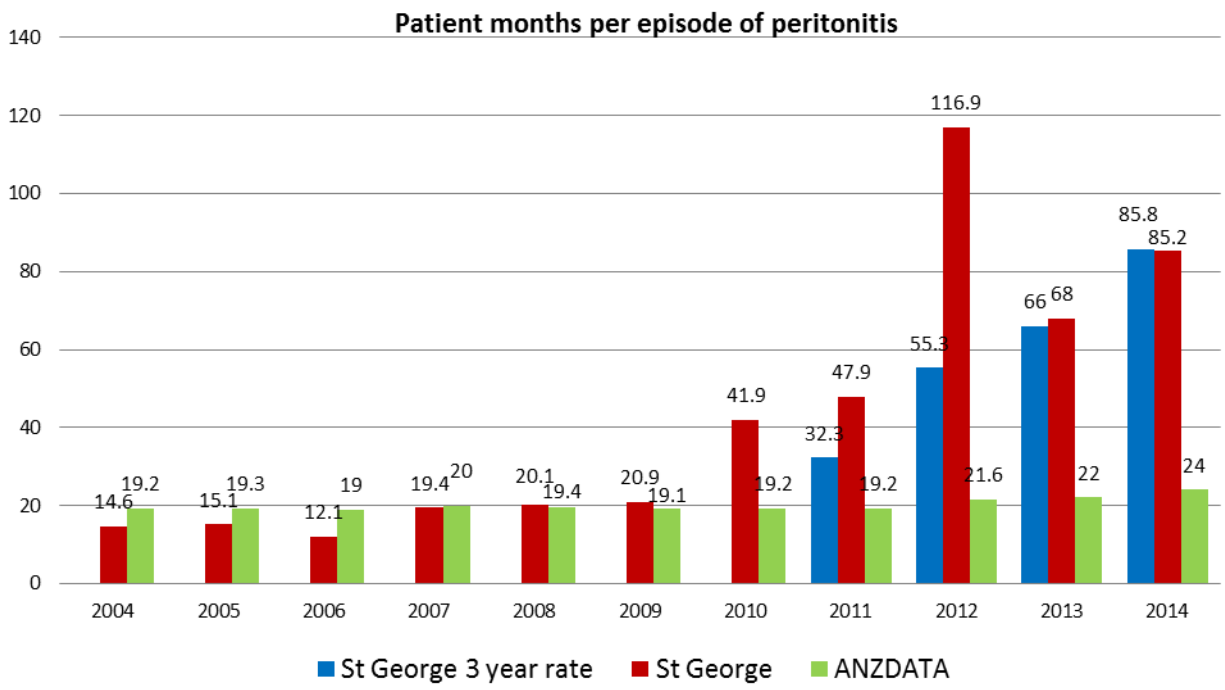
Table 4: PD patient survival

	STGH		Australia	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)
0	197	100.0	7033	100.0
1 year	150	92.1 (86.9-95.2)	5123	90.8 (90.1-91.5)
2 years	116	79.8 (72.7-85.2)	3547	78.9 (77.8-80.0)
3 years	89	70.8 (62.8-77.4)	2523	68.1 (66.7-69.4)
5 years	43	52.0 (42.3-60.8)	1146	48.7 (47.1-50.4)
10 years	3	31.5 (20.0-43.6)	36	21.9 (19.1-24.8)

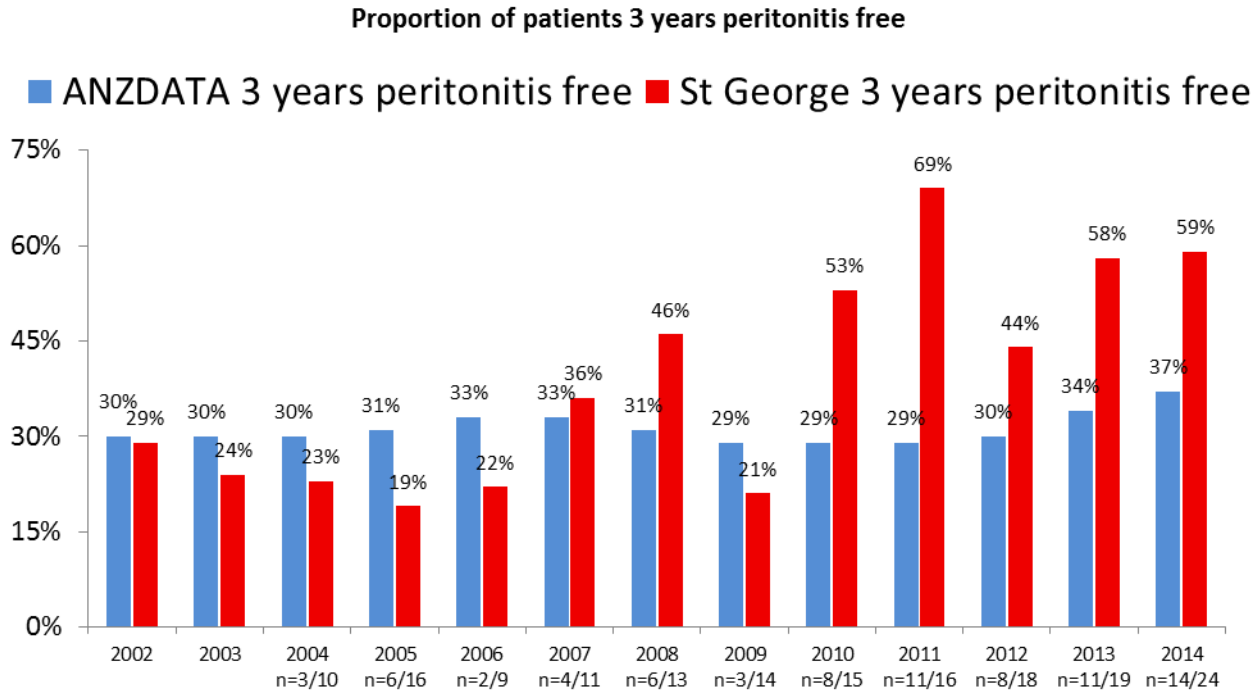
Peritoneal Dialysis



Peritonitis



Peritonitis Free Intervals



Peritoneal Dialysis

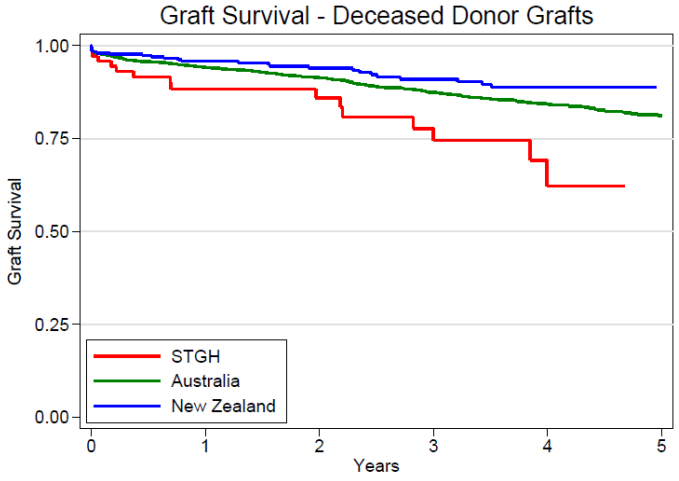
- ***Patient and technique survival above national average***
- ***Outstanding results for infection with very low peritonitis & ESI rates***

- Concerns
  - Highest transfer to HD rates to date (26% vs. ANZDATA 20%)
  - Despite excellent infection control there is 'creeping' higher overall failure of PD or withdrawal
  - Poor phosphate control

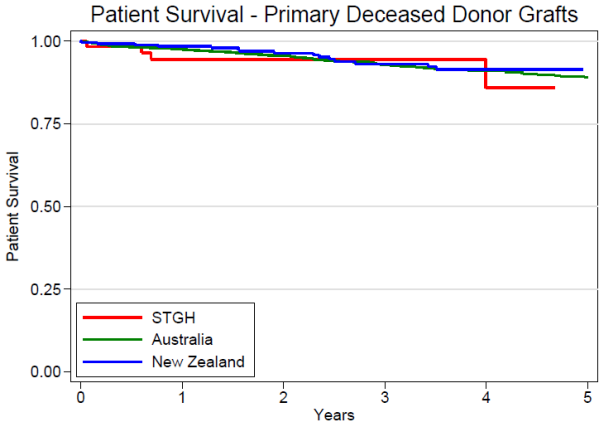
Transplants

- During 2014 there were 186 patients under the care of SGH nephrologists with functioning renal transplants.
  - 176 of these were primary grafts and 10 were second grafts
  - 47 of these patient received grafts from live donors
  - 11 were pre-emptive transplants

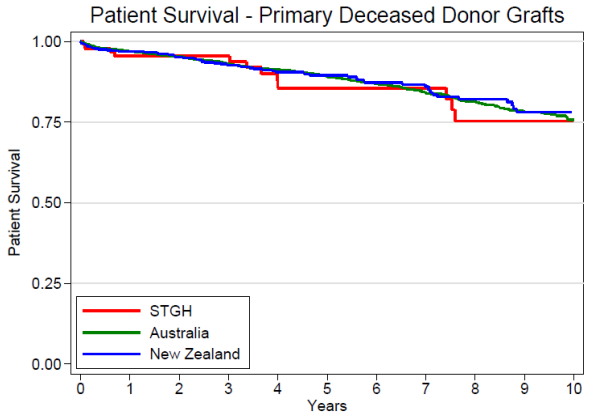
- By 12 months
  - fewer had creatinine <120 (38 vs 44%) c.f. National data
  - more deaths/graft loss (14 vs 6%).

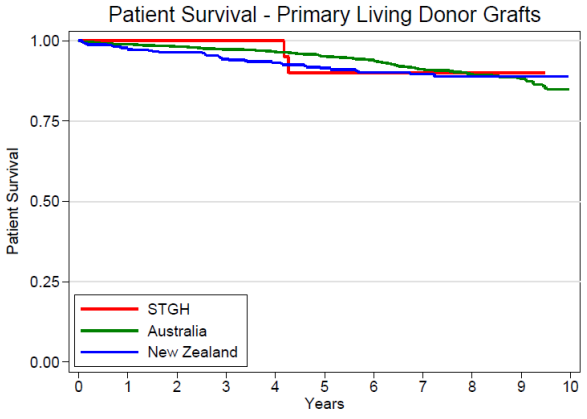


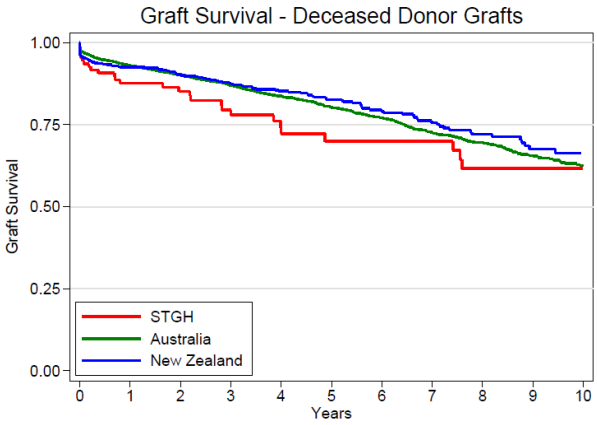
	STGH	Australia
Total Failures	16	440
Acute Rejection	2 (12.5)	58 (13.2)
CAN		74 (16.8)
Vascular/Technical	4 (25.0)	53 (12.0)
Recurrent Disease	2 (12.5)	11 (2.5)
Other	2 (12.5)	52 (11.8)
Death with Function	6 (37.5)	192 (43.6)

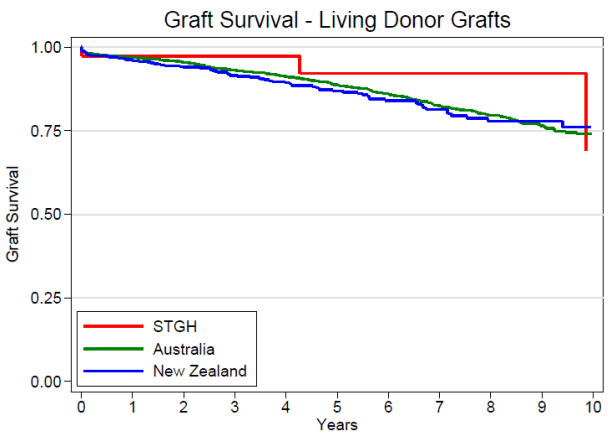


Transplant patient & graft survival 10 years

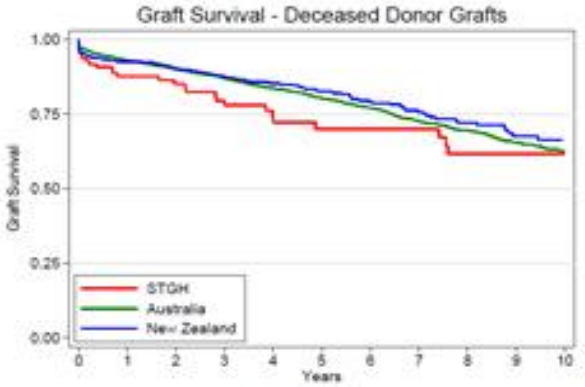








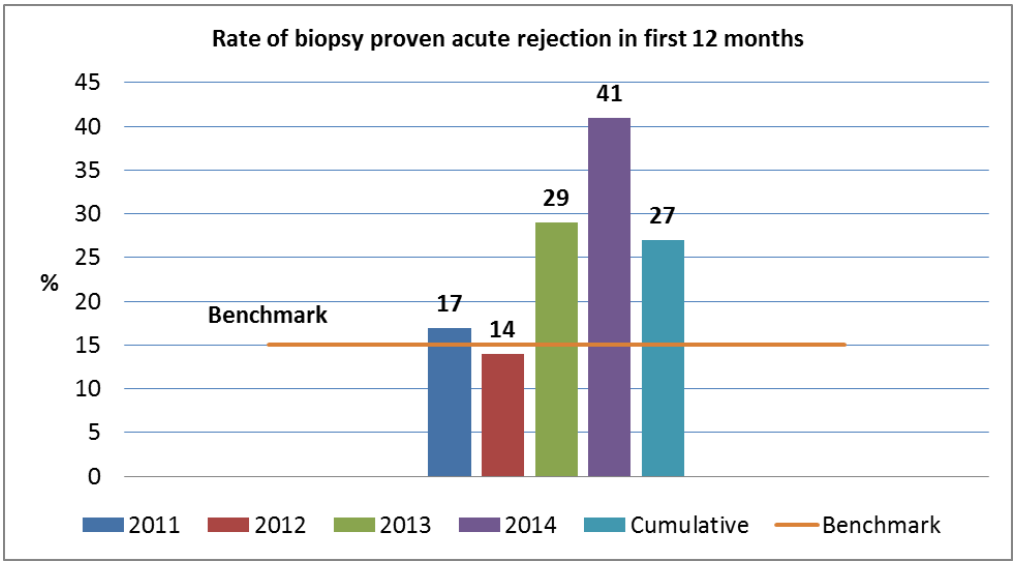
Deceased donor graft survival



	STGH		Australia	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)
0	108	100.0	4437	100.0
1 year	79	87.6 (79.6-92.6)	3602	93.1 (92.3-93.8)
2 years	65	85.1 (76.4-90.8)	3000	90.3 (89.4-91.2)
3 years	52	78.0 (67.6-85.4)	2449	87.0 (85.9-88.1)
5 years	30	69.9 (57.5-79.3)	1560	80.3 (78.8-81.6)
10 years	3	61.6 (47.3-73.2)	166	62.5 (59.6-65.2)

Transplants

NODAT above benchmark (20 vs 15%)
All infections less than benchmark
BK VAN only 5%; BK viremia 9%



Transplant waiting list

Age group	ANZDATA % age group on wait list (benchmark)	Wait list Oct 2014	Dialysis Oct 2014	SGH % age group on wait list Oct 2014
20-29	31%	2	5	40%
30-39	26%	9	11	82%
40-49	21%	12	19	63%
50-59	17%	15	40	38%
60-69	12%	17	63	27%
70-79	1%	1	74	1%
80+	<1%	0	57	0%

Every dialysis patient is accounted for as to whether or not they should be on the transplant waiting list

Donors

Cumulative 59% are medically unsuitable
Others have change of mind

	2009	2010	2011	2012	2013	2014
Renal Disease / Low GFR / asymmetric renal function	2	2	2	7	-	1
Immunological	3		-	-	-	1
Recipient issue	1	1	-	-	-	-
Diabetes/IGT	2	1	2	2	-	1
Change of Mind	2	2	2	2	1	3
Paraprotein/ Malignancy	1	-	1	-		1
HT/CVS	1		-	5	2	2
Social	1	-	-	-	-	-
Stone Disease	1	1	-	-	-	-
Other	-	-	-	3	5	5
Lost to F/Up	1	-	1	-	-	-

8/34 who are followed have had peri-operative complications
5/34 have new onset hypertension
Average loss of eGFR post donation is about 33%

Transplants - summary

- High rates of listing for transplantation – good or bad outcome?
- High rate of medically unsuitable donors
  - High (8/34) peri-operative complication rates for donors
- Similar patient survival as National Data
- Similar Live donor transplant graft survival as National Data
- Good infection rates compared with benchmarks
- Higher urological surgical complications than benchmark
- Higher BPAR rates than benchmark
- ***Poorer early and late graft function for deceased donors than National***
  - ? Higher early rejection rates
  - ? Technical
  - ? Other reasons

Renal supportive care

1. **Symptom control**: A reduction in total symptom scores within 3 clinic visits

Symptom burden Change from 1st to 3rd visit	n	%
Increased	56	34%
No Change	9	6%
Reduced	98	60%
Grand Total	163	100%

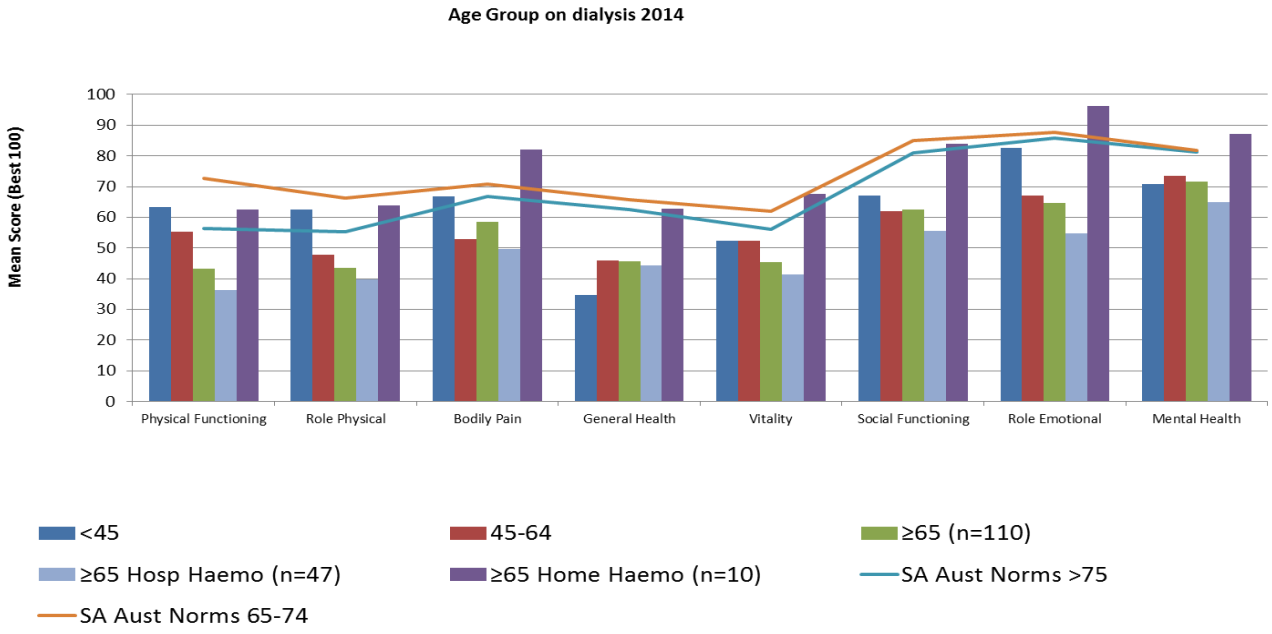
RSC – symptoms not confined to hospital HD patients

	Hosp HD %	PD %	Home HD %	Transplant %
	Nov 2014 n=133	Nov 2014 n=44	Nov 2014 n=19	Nov 2014 n=99
Pain	11.3	4.5	10.5	4.0
Shortness of Breath	9.0	4.5	0.0	3.0
Weakness or lack of energy	10.5	15.9	10.5	9.1
Nausea	3.0	0.0	0.0	2.0
Vomiting	0.0	0.0	0.0	0.0
Poor Appetite	3.0	6.8	0.0	1.0
Constipation	7.5	6.8	5.3	2.0
Mouth Problems	2.3	2.3	5.3	0.0
Drowsiness	8.3	2.3	0.0	5.1
Poor Mobility	12.8	11.4	5.3	5.1
Itching	5.3	4.5	5.3	0.0
Difficulty Sleeping	12.0	15.9	15.8	10.1
Restless Legs	5.3	6.8	15.8	3.0
Feeling anxious	5.3	4.5	5.3	2.0
Feeling depressed	5.3	2.3	5.3	5.1
Changes in Skin	6.8	4.5	5.3	6.1
Diarrhoea	1.5	2.3	0.0	1.0

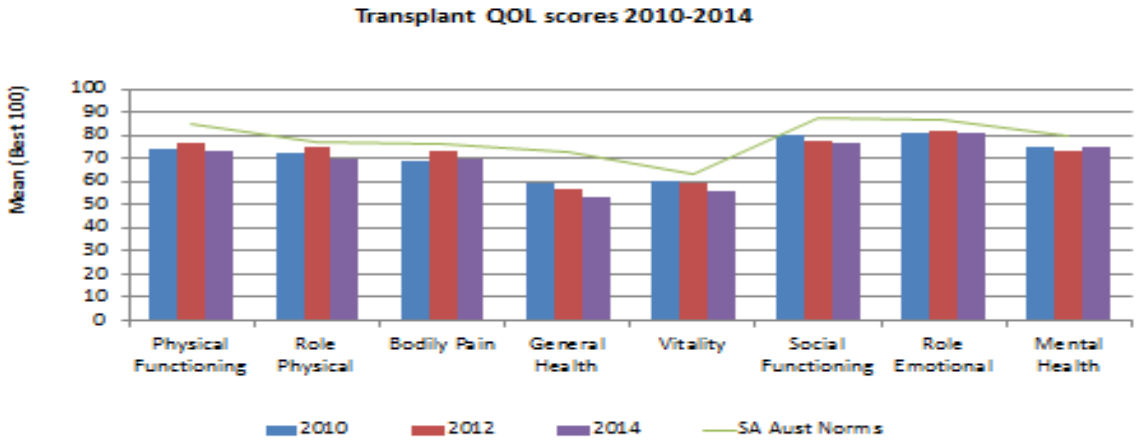
Renal Supportive Care

- **Advance Care Plans:**
  - 78% discussed or completed for RSC non-dialysis patients
  - Only 27% for appropriate HD patients
- **Symptom assessment in dialysis:**
  - Has identified symptoms more clearly
  - Making this part of routine management

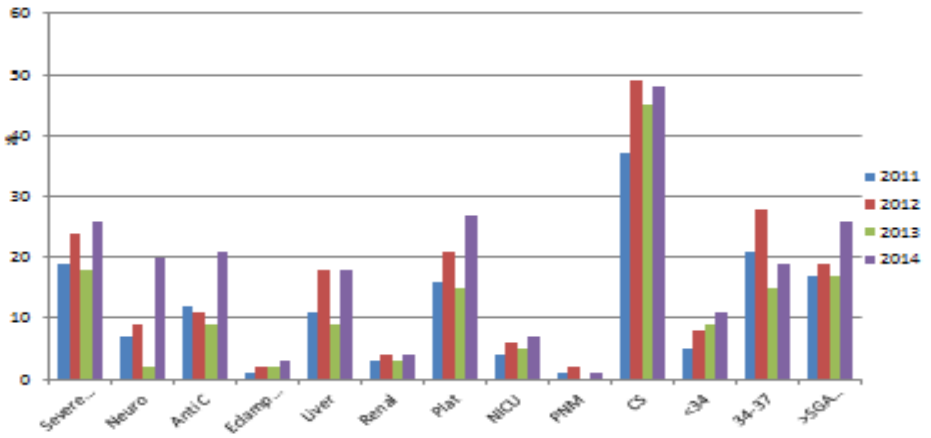
QOL – older home HD have good QOL



Transplant QOL similar to normal population



Trend in outcomes of Pre-eclampsia for singleton pregnancies 2011-2014



Hypertension in Pregnancy

- **Maternal outcome aims:**
  - Episodes of severe hypertension <30% (CHIPS) [1]
    - Achieved 23%
  - CS rate in nulliparous women <30% [2]
    - Not achieved 46%
-
- **Fetal outcomes:**
  - SGA rates <16% overall (GH<14, PE<26, EH<14, EH+PE<22%) [3]
    - Achieved 26% in PE
  - PNM rate of <10/1000
    - Achieved 4.2 per 1000 cases

Training & Education

- Student, JMO, BPT & Advanced trainee feedback positive
- Orientation successful & useful
- Advanced trainees identify the existence of training opportunities in
  - peritoneal dialysis,
  - greater use of CNCs for advanced training e.g. vascular
  - greater autonomy required for maximising learning opportunities in Obstetric Medicine.
- Monday clinic workload for BPTs & ATs can be problematic

Renal Biopsy

Year N	2011 N=109	2012 N=86	2013 N=118	2014 N=123	Last 4 years N=436
Total complications	10(11)	7.2(6)	5.1(6)	6.5(8)	7.1(31)
Macroscopic Haematuria, %(n)	4.6(5)	3.5(3)	3.3(4)	6.5(8)	4.6(20)
Perinephric Haematoma, %(n)	4.6(5)	3.5(3)	1.7(2)	0.8(1)	2.5(11)
Perinephric bleed – angioembolisation, %(n)	0(0)	0(0)	0(0)	0(0)	0(0)
Required blood transfusion	1(1)	4.7(4)	0.8(1)	0(0)	1.3(6)

Bench marks (Am J Kidney Dis 60(1):62-73. 2012) are:

Macroscopic hematuria 3.5% - **not met**
Blood transfusion 1%- **met**
Angio-embolisation 0.6%- **met**

Plan to implement a formal credentialing process for Advanced Trainees

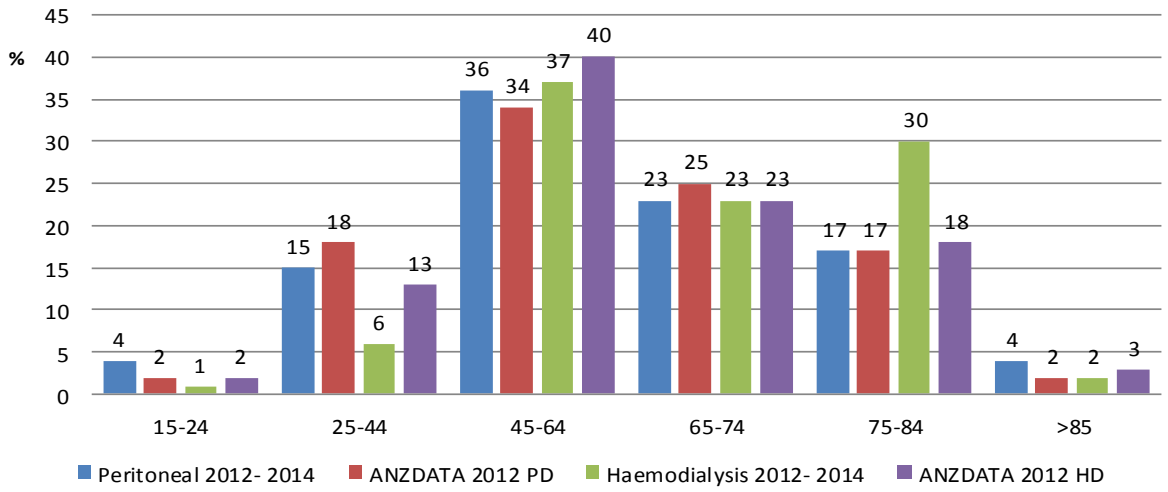
2. ACCEPTANCE ONTO DIALYSIS AND PRE-DIALYSIS PROGRAM

Shelley Tranter

Out of 51 new patients who started dialysis in 2014, 20 patients commenced peritoneal dialysis and 31 started haemodialysis. Patients are analysed according to their first mode of dialysis only.

- There were 10 (19%) late referrals which is below the National average (21%). One late referral received PD as first modality.
- Mean age at commencement of PD was 63 years in 2014 and for haemodialysis 69 years. The age of patients starting haemodialysis was older than in 2013 (64 years).

Age Groups of New Patients 2012-2014 compared to ANZDATA 2013 Report

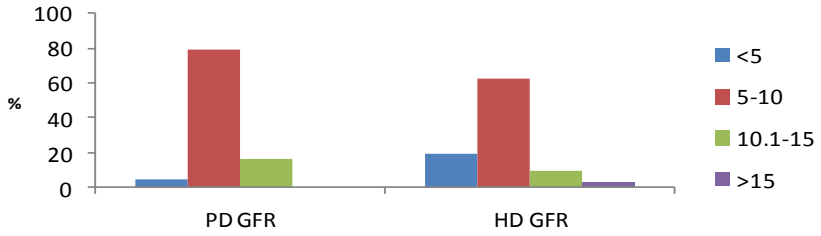


The major finding for acceptance to haemodialysis is that we started more patients than nationally in the 75-84 age group.

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, with the vast majority commencing at an eGFR below 10ml/min.

PD and haemodialysis eGFR at commencement 2013 -2014



Baseline characteristics of new patients

Body mass index

St George Hospital new patients		PD 2012 – 2014 (%) N=52	ANZDATA 2013 (%)	HD 2012 – 2014 (%) N=98	ANZDATA 2013 (%)
Body Mass Index	<20	4		6	
(kg/m)	20-24	14		17	
	25-30	18		31	
	>30	15	No data	33	37%
	>35	1	No data	11	19%

According to ANZDATA (2013), BMI <20 indicates underweight, 20-25 normal, 26-30 overweight, >30 is obese and >35 morbidly obese. **Excludes patients who had haemodialysis prior to peritoneal dialysis.*

		St George HD 2012-14 (n=98*)	ANZDATA HD 2013 (n=1788)	St George PD 2012-14 (n=52*)	ANZDATA PD 2013 (n=657)
Age	(Average age in years)	66	60†	61	60†
Gender	Male	59%	62%	73%	60%
	Female	40%	38%	27%	40%
Late Referral	(< 3 months before first treatment)	19%	26%	5%	11%
Co-morbidities	Smoking (Current and former)	51%	54%†	40%	54%†
	Chronic Lung Disease (yes and suspected)	15%	18%	13%	9%
	Cerebrovascular Disease	10%	10%	13%	12%
	Coronary Artery Disease	36%	33%	31%	26%
	Peripheral Vascular Disease	16%	17%	19%	15%
	Diabetes	47%	50%	44%	42%

*Excludes patients who had previous mode of dialysis. † Total dialysis population (Hd + PD) ANZDATA 2012

We can conclude from these data that we are accepting patients for haemodialysis who are older than accepted nationally. Otherwise we have a fairly similar profile to those nationally and there is no major departure from standard practice either in terms of acceptance of patients or the timing of commencement of dialysis.

Predialysis Program

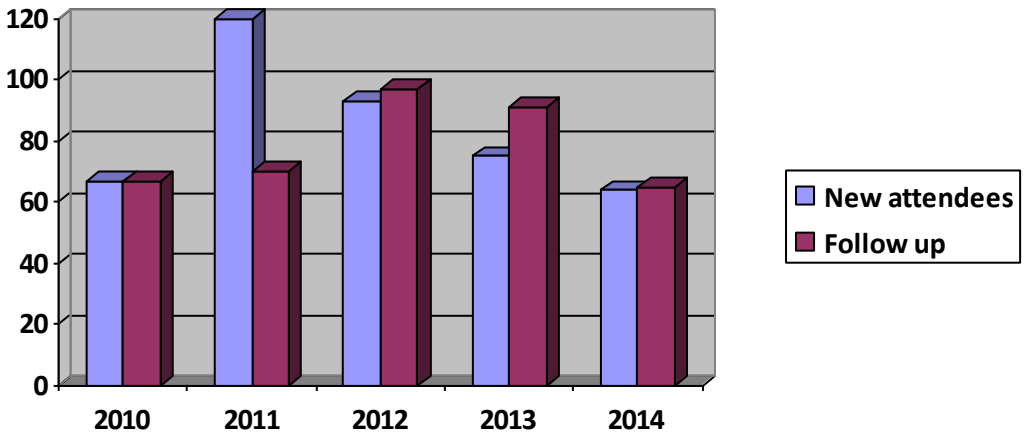
Shelley Tranter

Activity summary

The Renal Department guideline for referral to the multidisciplinary Predialysis Clinic changed in 2014 from Creatinine >300umol/L and/or eGFR < 25ml/min to eGFR ≤ 15 or dialysis predicted in the following year. Generally, nephrologists will have considered these patients as suitable for dialysis. As of December 31st 2014, there were 142 patients on the Predialysis Program with an active plan for renal replacement therapy.

Since April 2002 there have been 759 people who have attended the clinic. 64 new patients attended clinic in 2014 compared to 75 new attendees in 2013. There were 63 follow up appointments compared to 93 follow up appointments in 2013. The reduced attendances can be explained by the drop in referral eGFR.

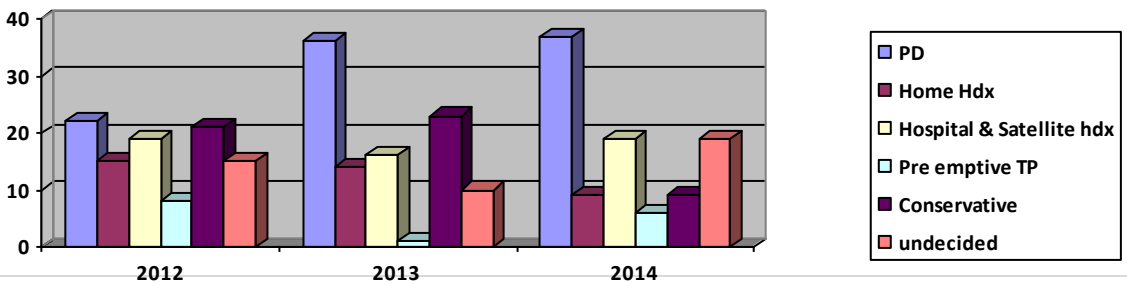
New attendees and follow up numbers since for 2010-14



The age range of new patients seen in 2014 was 21 – 88 years. The average age was 65.2 years which is lower than the previous 3 years.

Following the visit to the clinic patients are asked to opt for a tentative treatment option. The table below indicates the choice of patients 2012 -2014. In 2014 there has been a reduction in patients opting for the conservative pathway. This most probably reflects the referral of patients directly to RSC rather than to the predialysis Clinic. There has been an increase in patients who have not decided on a pathway most of which are elderly and will most probably decide on conservative.

Percent of patients who opt for specific RRT therapies as a result of pre-dialysis education 2012-14



It is apparent from these data that over half the patients who had been referred to the pre-dialysis clinic opt to have a home therapy or a pre emptive transplant.

KPIs

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

1. Timely referral to Predialysis Program - 100% ≥eGFR 15. This benchmark was changed from previous reports to reflect the change in clinic referral criteria.
2. 70% of patients who are known to the unit and have attended Predialysis Clinic commence planned dialysis choice.
3. At the commencement of RRT 80% of patients will have had a review in the pre-dialysis assessment and education program greater than 3 months previously and within 12 months.
4. 60% of patients starting RRT are HBsAb positive

1. Timely referral to Predialysis Program - 100% ≥ eGFR 15.

In 2014, 73% of patients were referred with an eGFR ≥ 15 (excludes patients who were late referral to nephrologist).

2. 70% of patients who are known to the unit and have attended Predialysis Clinic commence planned dialysis choice.

For patients commencing dialysis in 2014 80% people started the planned dialysis choice

18/19 95% of patients who chose PD commenced PD. One patient commenced acutely on haemodialysis and transferred to PD. 63% (12/19) started 4 west and satellite dialysis as planned. 37% patients who chose home haemodialysis were successfully home trained. There were 8 people who chose home hdx but only 3 were trained

As with 2013, these data highlight the intermittent problem of not having enough home HD training places.

3. At the commencement of RRT 80% of patients will have had a review in the pre-dialysis assessment and education program greater than 3 months previously and within 12 months.

92% of new dialysis patients (excluding late referrals) had pre-dialysis education or review within 12 months before dialysis commencement. This result is an improvement on the previous year.

4. 60% starting RRT had vaccinated immunity

In previous years the KPI was 70% of patients who had been through the Predialysis Clinic and commenced dialysis had completed a course of hepatitis B vaccinations. For this report the benchmark was changed to 60% of patients starting dialysis had 'vaccinated immunity' defined as 'anti-HBs ≥10 International units/L'. Those with natural immunity were excluded in this analysis. The finding for 2014 was only 30%. Further work examining hepatitis B vaccination will be conducted in 2015 to identify areas for improvement.

3. Haemodialysis report (2014)

Summary and Data report prepared by: Tracey Blow, Yasko Takatori, Ivor Katz, Saiyini Pirabhahar and Louise Jordan

Activity

St George Hospital operates a 34 chair haemodialysis service providing high level care haemodialysis and home haemodialysis training. On average 120 patients were dialysed each month and a total of 19,052 treatments completed, a minor increase from 2013. The number of patients dialysed climbed to 126 at the end of 2014, compared with 116 at the end of 2013.

The Satellite haemodialysis service at The Sutherland Hospital operates twelve chairs for low care patients. In 2014, the remaining two chairs opened and 6440 treatments were performed, a 13.2 % increase from the previous year. On average 43 patients were dialysed each month.

Home haemodialysis training commenced for 10 patients during 2014, 9 patients completed training, 1 failed and there were 2 patients in training as of December 31st. Respite dialysis continued to be a well utilised service with 216 treatments provided and a temporary third machine was supplied by the Sydney Dialysis Centre to assist training an additional patient. The average age of the home patient increased from 53 years in 2011 to 58 years in 2014 and the average length of training time increased from 8 weeks in 2011 to 9 weeks in 2014. Two patients successfully transferred to Haemodiafiltration (HDF) and nocturnal dialysis was popular in 2014 with three patients changing modes and a total of thirteen patients dialysing 8-10 hours a night.

Activity for haemodialysis

Activity increased across the two sites in 2014 with a total of *25,492* sessions performed (in-centre and satellite treatments). The graph below shows growth patterns from 2002 with a 13% increase in 2014.This includes haemodialysis for both acute and chronic kidney disease.

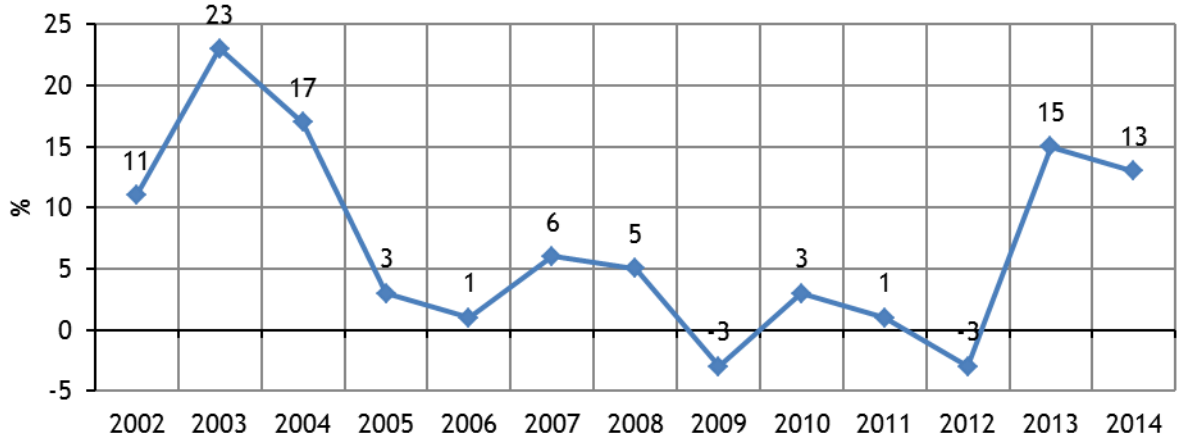


Figure 1. Dialysis rates by patient number per modality per year at St George and Sutherland Dialysis Units

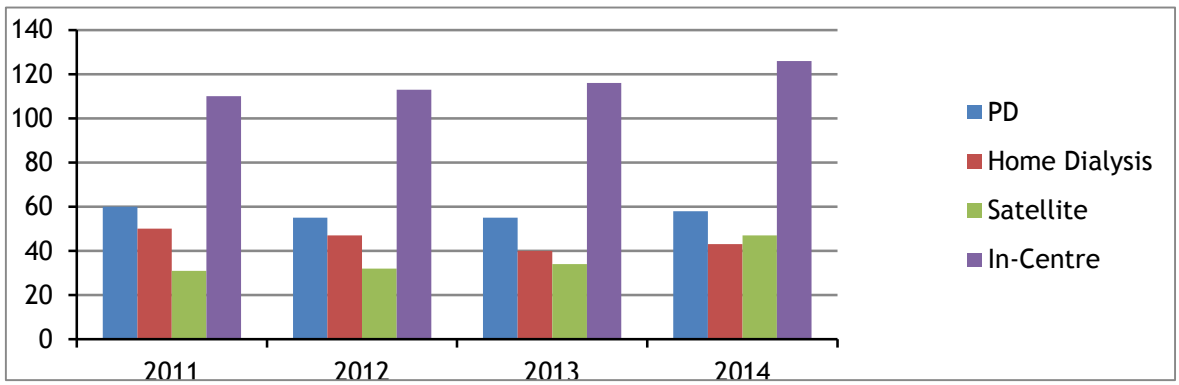


Figure 2. Table 1: Distributions of dialysis modalities for 2011 through to 2014

Table 1. Patient Flow at St George Hospital 2011 to 2014

In-centre haemodialysis patients at beginning of year		2011	2012	2013	2014
N value		111	110	118	116
In 1)	New Patients	26	22	36	36
2)	Transfers from other units	1	2	1	1
3)	Transfers from PD	2	7	10	14
4)	Failed transplants	11	4	4	1
5)	Transfers from Home Hdx/Satellite	2	0	7	2
6)	Acutes			19	28
Subtotal		***42***	***35***	***77***	***82***
Out					
8)	Transplants	5	7	4	3
9)	Transfers to other units/overseas	2	2	2	2
10)	Transfers to Home Hdx	4	2	4	3
12)	Transfers to PD	2	3	4	5
13)	Transfers to Satellite	8	6	15	10
14)	Regain Function	0	0	15	26
15)	Deaths (medical)	19	8	19	11
16)	Deaths (withdrawal)	5	7	16	12
Subtotal		***45***	***35***	***79***	***72***
Net Gain		-1	-	-2	10
In-centre haemodialysis patients at end of year		**110**	**118**	**116**	**126**

Table 2. Patient Flow Sutherland Satellite 2011 to 2014

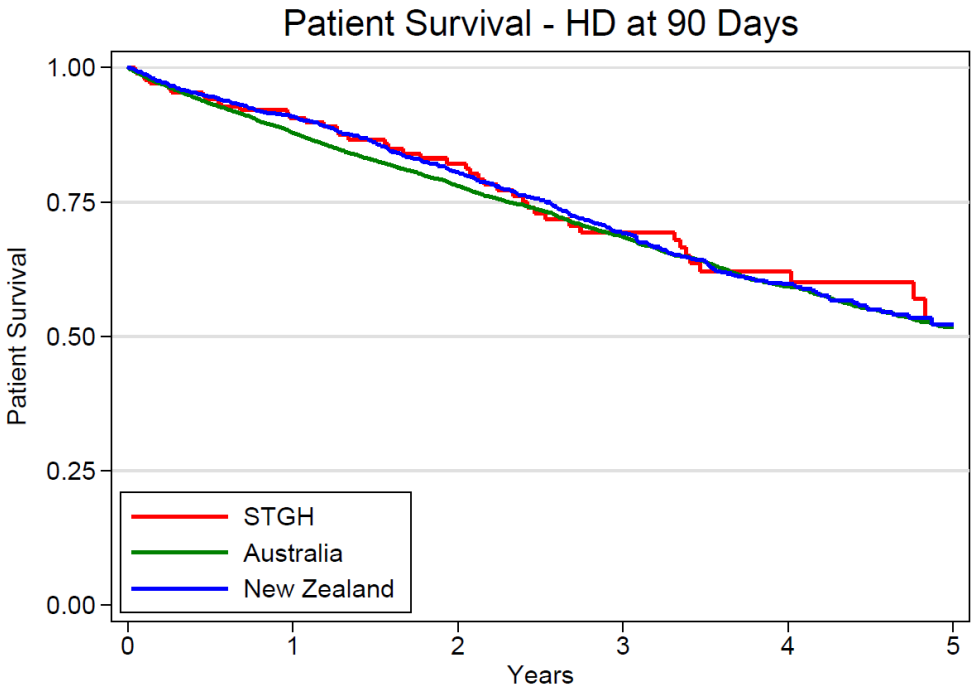
Satellite haemodialysis patients at beginning of year		2011	2012	2013	2014
		34	33	34	39
In a)	New Patients	1	1	1	1
b)	Transfers from other units	1	1	0	1
c)	Transfer from PD	0	0	0	1
d)	Transfer from Incentre	8	14	8	10
Subtotal		***10***	***16***	***9***	***13***
Out e)	Transplants	3	1	1	0
f)	Transfers to Home Hdx	1	0	1	2
g)	Transfers to PD	0	0	2	0
h)	Transfers to Incentre	0	1	3	0
i)	Transfer to other units	0	0	0	1
J)	Deaths (medical)	2	5	4	2
K)	Deaths (withdrawal)	2	2	1	0
l)	Regain Function	0	0	0	0
Subtotal		***8***	***9***	***12***	***5***
Net Gain		2	7	-3	8
Satellite haemodialysis patients at end of year		**31**	**35**	**39**	**47**

Table 3. Flow to and from Home Haemodialysis from 2011 to 2014

Home haemodialysis patients at beginning of year		2011	2012	2013	2014
		51	48	47	40
In	New Patients	3	4	3	4
	Transfer from PD	0	0	0	1
	Transfers from other units	1	1	0	0
	Transfer from Satellite	1	0	0	2
	Failed transplants	0	0	0	0
	Transfer from Incentre Hdx	5	3	4	3
Subtotal		***11***	***8***	***9***	***10***
Out	Transplants	7	7	10	4
	Transfers to other units	0	1	1	0
	Transfers to Incentre Hdx	0	0	2	1
	Transfers to Satellite	1	0	0	1
	Deaths	4	1	3	1
Subtotal		***12***	***9***	***16***	***7***
Net Gain/Loss		-1	-2	-7	3
Home haemodialysis patients at end of year		50	47	40	43

Executive Summary:

- Activity increased throughout 2014 with an overall growth of 13% across the sites.
- On the 31st December 2014, 47 (17%) St George and Sutherland patients were dialysing at the Satellite unit.
- Thirty eight percent (38 %) of patients were dialysing on a home therapy (PD and HD) compared to **27% nationally** and 46% of patients were dialysing in the hospital based facility.
- Respite dialysis for home patients remained a valuable service in 2014 and is likely to be increase in future. A review of the home haemodialysis program is required to ensure adequate staff levels are provided to facilitate additional training and outpatient support.
- Both haemodialysis services reached capacity at the end of 2014 and planning commenced for a night shift at St George Hospital to manage the demand on the service but to also offer another component of haemodialysis care.
- In light need to increase haemodialysis capacity a concerted effort is underway to develop a new stand-alone satellite haemodialysis unit for the St George area to manage future growth and demands on the service.



Data are for patients dialysed from 2008 to Dec 31st 2013.
Patient survival was at least as good as if not slightly better than the national average with one year survival of 91% and 5 year survival 54%. This is for our cohort which is slightly older than the national average.

HD Dialysis technique survival was not provided by ANZDATA on this occasion.

For ALL dialysis patients the Standardised Mortality Ratio for St. George/TSH patients was 1.0, i.e. no excess of deaths above that expected (ANZDATA 2013).

Using 10 yr. data provided by ANZDATA patient survival is similar to National survival.

Table 3: HD patient survival

	STGH		Australia	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)
0	330	100.0	15739	100.0
1 year	248	90.8 (86.9-93.5)	11547	87.5 (86.9-88.0)
2 years	189	80.1 (74.9-84.4)	8372	77.0 (76.2-77.7)
3 years	135	67.2 (60.9-72.7)	5963	66.9 (66.0-67.7)
5 years	70	49.9 (42.7-56.7)	2780	49.3 (48.2-50.3)
10 years	1	15.5 (6.6-27.7)	75	19.0 (17.2-20.9)

Haemodialysis Clinical, Biochemical and Dialysis Adequacy Evaluation

- An audit of our results are carried out in April and October each year for the chronic in-centre and satellite haemodialysis patients
- Where applicable our results are evaluated against the national KPIs e.g. ANZDATA
- In other instances data are evaluated against the existing national and international guidelines e.g. CARI guidelines, KDOQI

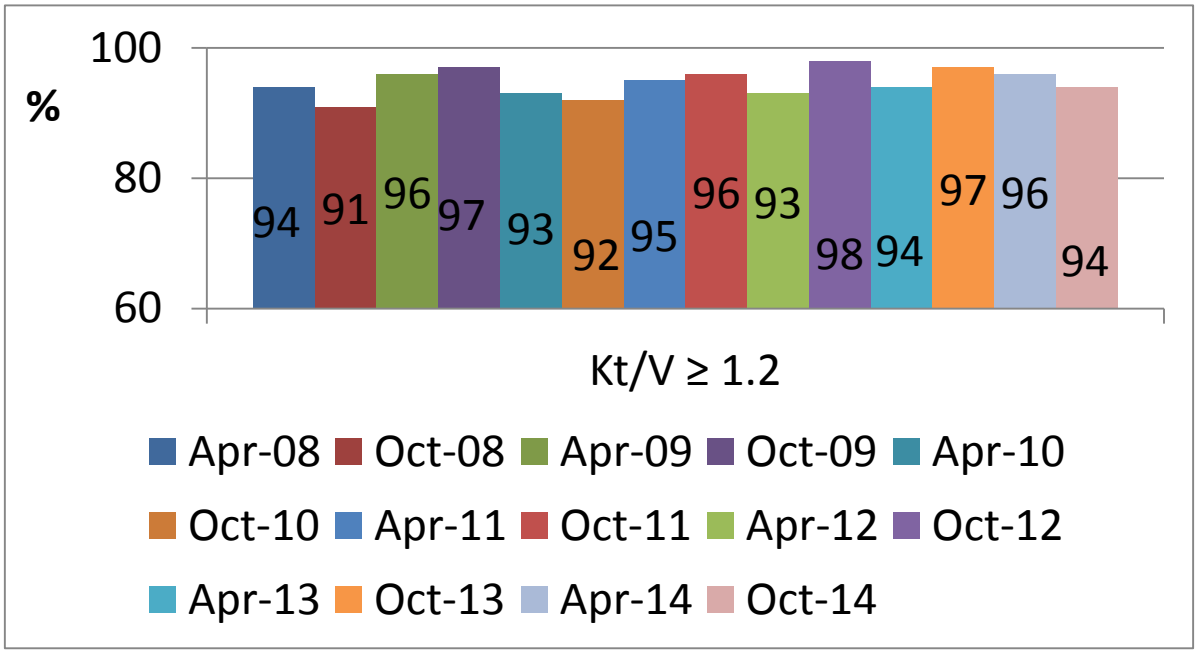


Figure 1. Dialysis Adequacy assessed by Kt/v from 2008 to 2014

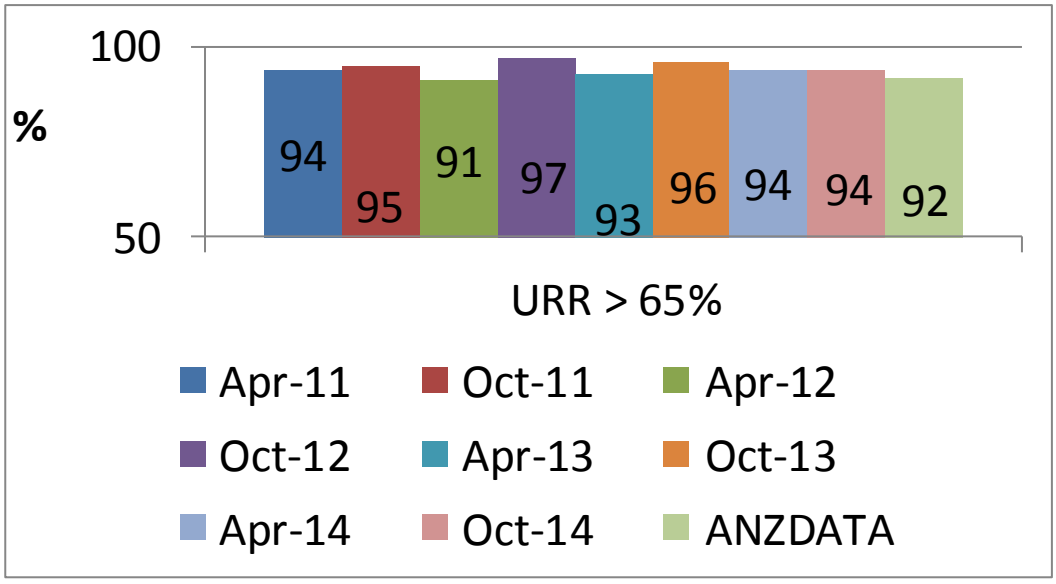


Figure 2. Urea Reduction Ratio (URR) >65% in patients on Haemodialysis by Year
The St George rates for clearance using the Urea Reduction Ratio (URR) remain similar if not slightly better compared to national data from ANZDATA, which were 94% and 91% respectively.

Parameter	Target	Apr 12	Oct 12	Apr 13	Oct 13	Apr 14	Oct 14	ANZDATA 13
Ca	2.25-2.58 mmol/L	64	51	60	57	70	60	-
Corr Ca	2.1-2.4 mol/L	42	54	49	40	33	41	37
PO4	0.8-1.6 mmol/L	64	65	62	61	63	54	53
$CaPO_4$	<4.0 mmol/L	74	70	71	67	71	62	47
Ferritin	200-800 ug/L	75	67	76	69	69	71	56
Fe T Sats	20-50%	73	64	72	68	72	66	66
Albumin	33-48 g/L	71	54	59	56	59	60	-
PCR	<1.0	57	52	64	55	55	51	-
KT/V	≥ 1.2	93	98	94	97	96	94	-
URR	>65%	91	97	93	96	94	94	91

Table 1. Blood biochemical targets and percentage of patients achieving target levels

Targets for the biochemical markers of renal bone mineral disease were similar to or slightly better for St George haemodialysis (STG HD) compared with the national average (ANZDATA) i.e. serum corrected calcium (41% vs. 37%), serum phosphate (54% vs. 53%) and calcium phosphate product (62% vs. 47%).
Measurement of serum iron stores were similar for both STG HD and ANZDATA. i.e. serum ferritin (71% vs. 56%) and iron transferring saturation (both 66%)

Dialysis Duration (Hours on dialysis)

There is increasing evidence that time on dialysis is a key factor to improve outcomes.

Table 2. Dialysis duration per individual dialysis session at St George and Sutherland Hospitals (%)

Duration (hours)	St George Hospital	Sutherland Hospital
< 4	0	1
4	49	16
4.5	28	14
5	32	15
5.5	1	1

Thirty one percent (31%) of in centre or satellite haemodialysis achieve the KPI of >15 hours on dialysis per week. This is slightly below the ANZDATA national average of 35%. In 2009 it was only 14% at St George and Sutherland hospitals

Home Haemodialysis

Table 3. Home haemodialysis dialysis dose (hours on dialysis)

Duration (hours)	Home haemo	Frequency of dialysis
12 hrs week	1	3 x week = 13
15-16.5 hrs week	7	Alternate days = 26
17-19 hrs week	14	4 x week = 3
20-22 hrs week	10	
24-27 hrs week	3	
28 hrs week	5	
32 hrs week	2	

Average time per week 21.5hours.
Statistics are acquired from patients and not from analysis of patient machine

Twenty eight (65%) out of 43 home dialysis patients are using an ESA.

The average age of the home HD patients this last year was 58.4 years, up from 2011 when the average age 53.4 years old.

In 2011, average age to start training was 51 years and in 2014 it had risen to 61 years old.

The average days required for training a new patient was 44.8 days compared with 40.6 days in 2011.Some of this may be related to the increased complexity of machines

Haemoglobin Targets

The current haemoglobin (Hb) target range is now set at 100 to 120 g/dL.

Apr 14: Mean 116, SD 13.4, min 74, max 152
Oct 14: Mean 114, SD 11.9, min 77, max 142

In Australia, median haemoglobin for each centre ranged from 105 to 122 g/L for haemodialysis patients (ANZDATA)

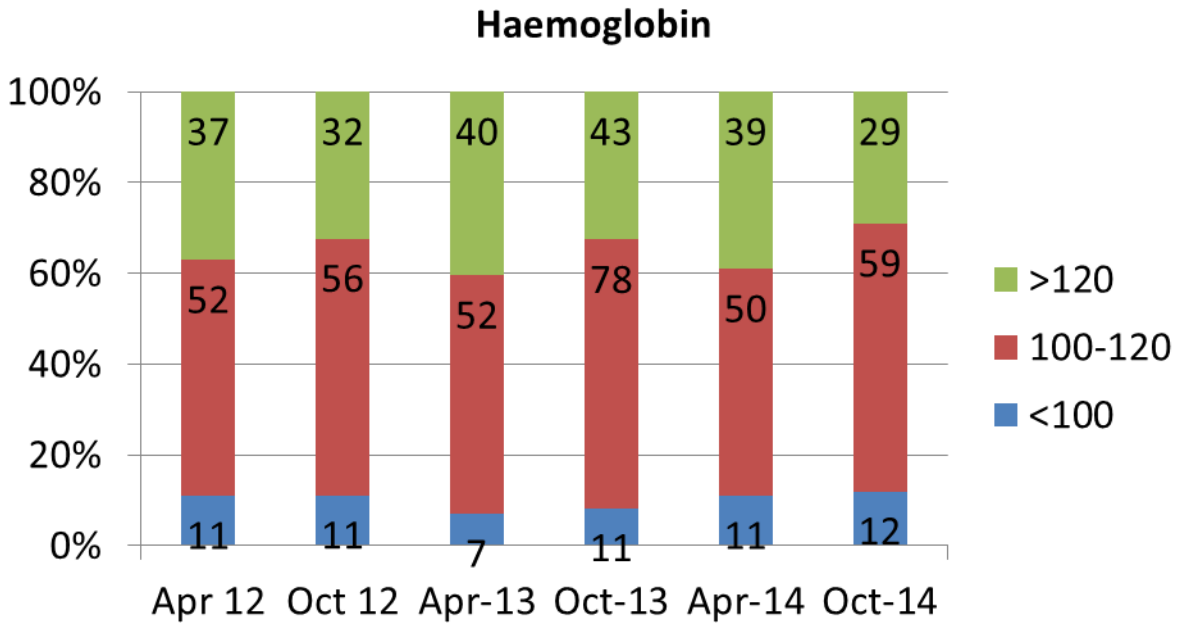


Figure 3. Serum Haemoglobin levels categorised by target level

Anaemia Management Erythropoietin Use and Serum Iron Studies

A total of 174 patients were audited at St George Hospital and Sutherland hospital for use and dosing of an erythropoietin stimulating agent (ESA) agent. One hundred and twenty (n=120; 69%) were receiving an ESA in October 2014. Fifteen percent (15%; n=26) were having their ESA withheld as their Hb was above target i.e. >120mg/dL. Sixteen percent (16%;n=28) were not on an ESA.

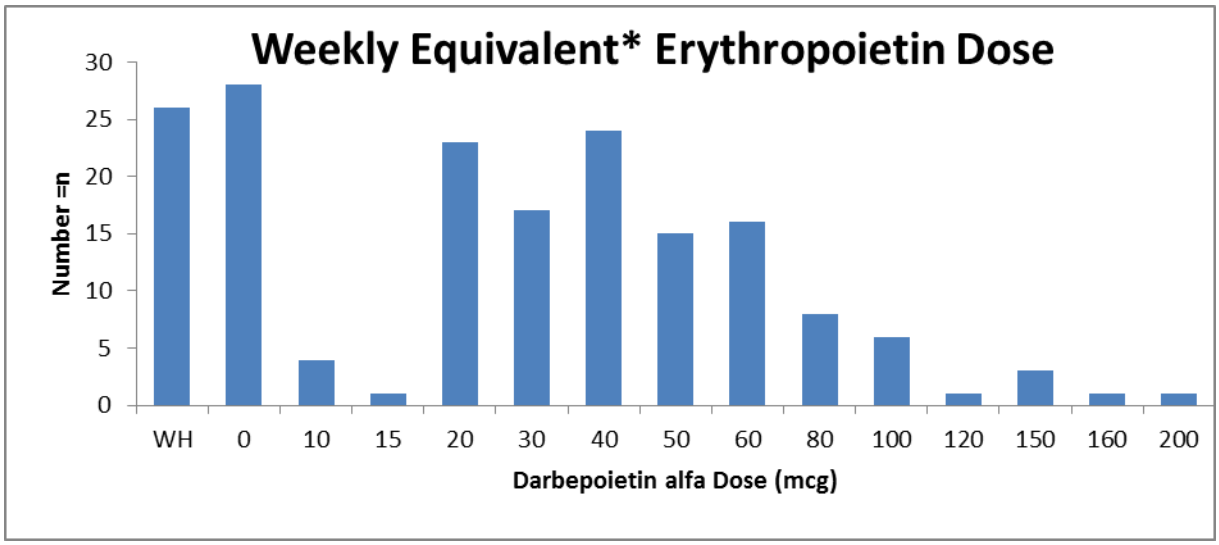


Figure 4. Patients Weekly Equivalent Darbepoietin ESA Dose at St George and Sutherland Dialysis Units

* Equivalent dose when using another ESA.
WH = withheld i.e. ESA dose is currently being withheld
Note: Where doses given fortnightly or monthly they were averaged to a weekly dose

ANZDATA revealed 87% of patients to be on an ESA in the 2012 survey. If we include those we are withholding it would be around 80% which is still lower. Importantly our Hb mean is similar.

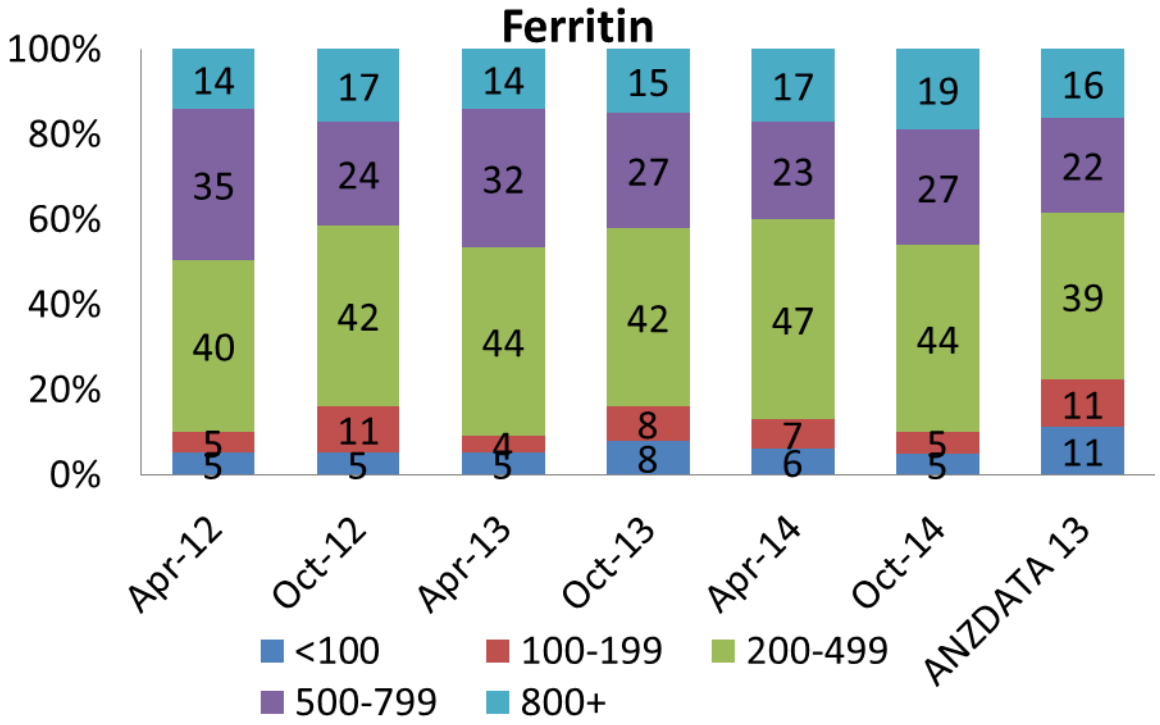


Figure 5. Serum Ferritin levels by target level

In Australia and New Zealand ANZDATA 2013 demonstrates the proportions of haemodialysis patients with ferritin <200 mcg/Land those with ferritin ≥ 500 mcg/L have been relatively stable.
Those with serum ferritin 200-500mcg/L at St George and Sutherland were 46% which was slightly higher when compared with 35% from the ANZDATA 2013 report.
Target levels for serum ferritin are from 200-400 with safe levels being levels being that <800. Nineteen percent of our patients had a serum ferritin >800 vs. 16% from ANZDATA.

Target levels for transferrin saturation are between 20-40% are targeted to ensure optimal iron stores. At St George and Sutherland hospital we had 59% in this range, slightly above national figures.

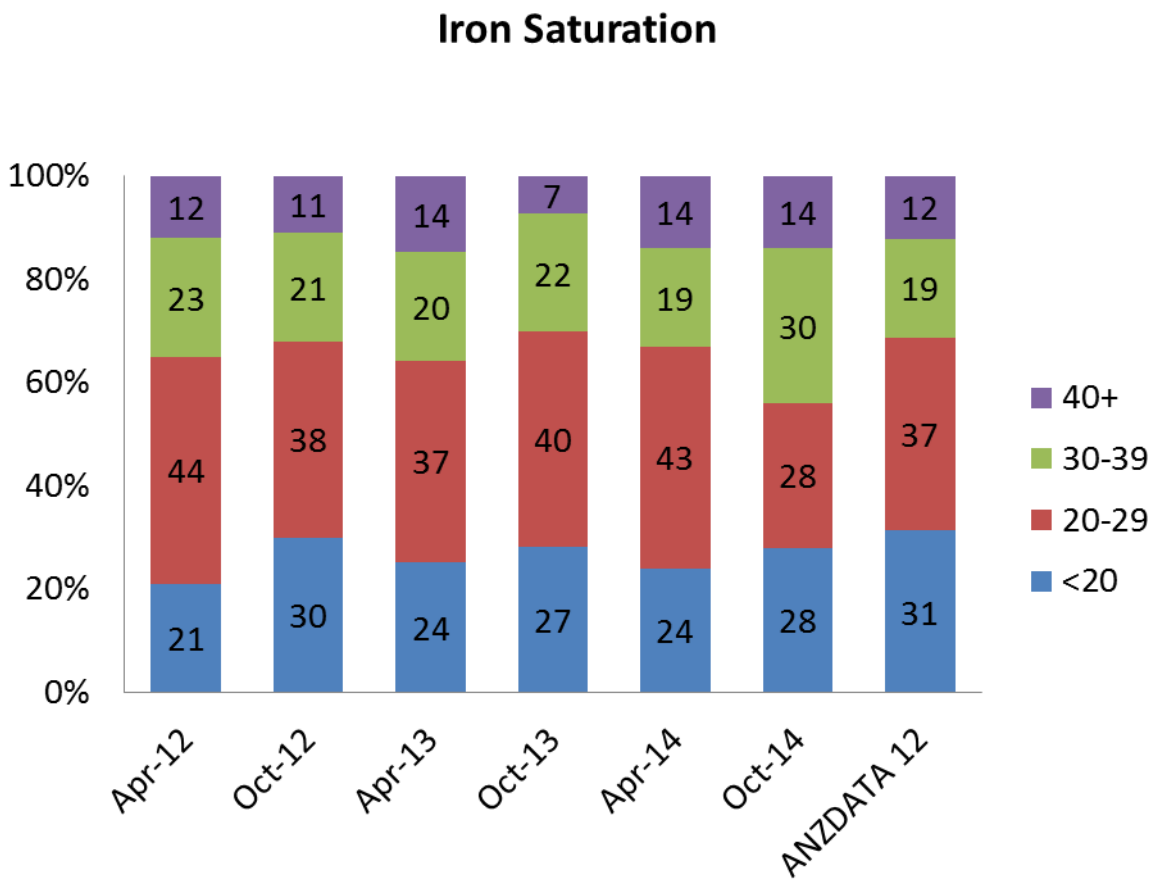


Figure 6. Serum Iron Saturation by target Level

RENAL BONE AND MINERAL DISORDER (MBD) METABOLISM MANAGEMENT

PTH targets in dialysis patients are 5-9x the normal laboratory level. Levels which are too low or too high are associated with morbidity e.g. bone fractures.

Only a very small number of our patients have iPTH levels at those associated with increased morbidity i.e. levels above 52 pmol/L or < 3.5 pmol/L (3%). Parathyroid hormone levels are not reported in ANZDATA.

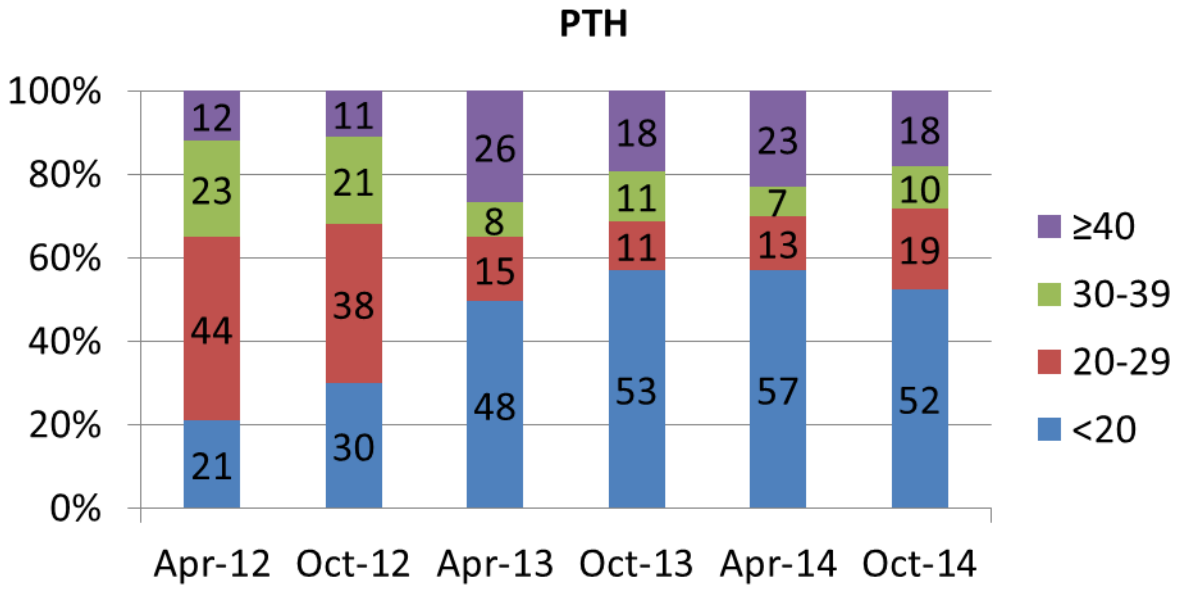


Figure 7. Serum PTH for Haemodialysis patients from 2012 to 2014

More patients were within the target calcium level 2.2-2.5mmol/L compared with ANZDATA i.e. 71% versus 60%.

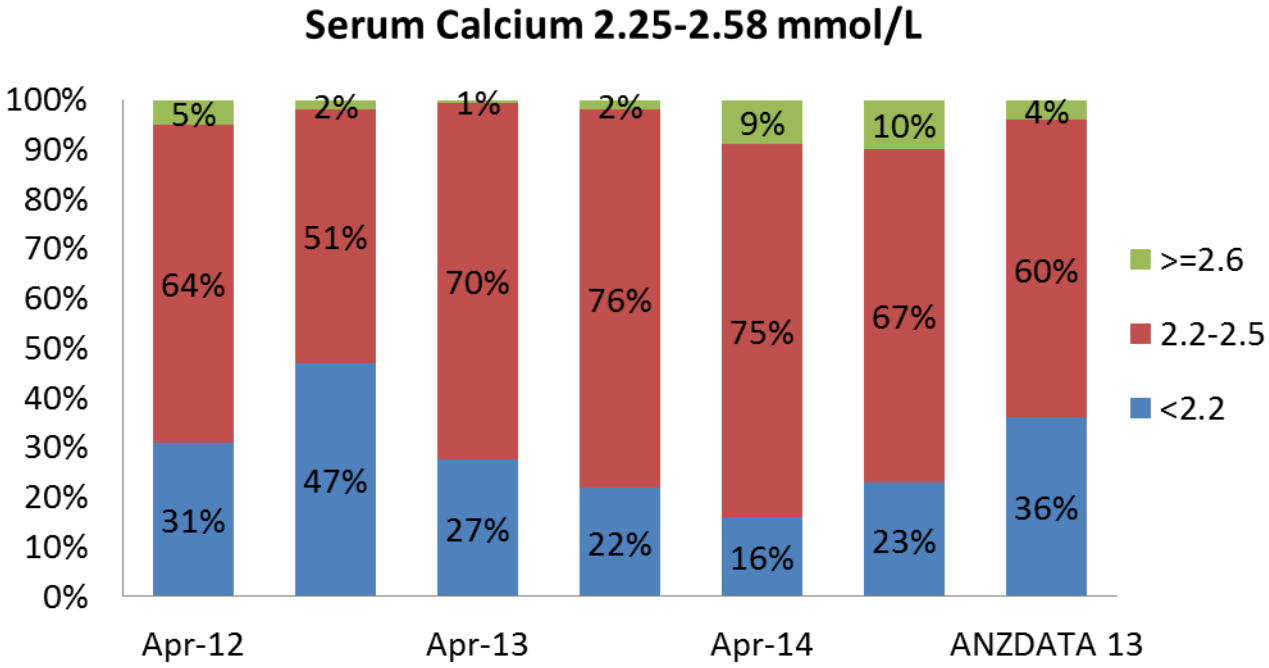


Figure 8. Serum Calcium target levels 2012 to 2014 versus ANZDATA

A similar number of patients were within the target Phosphate range 1.4-1.7mmol/L as per ANZDATA. 56% were at a level of 1.6 or above nationally and slightly better (51%) AT St George.

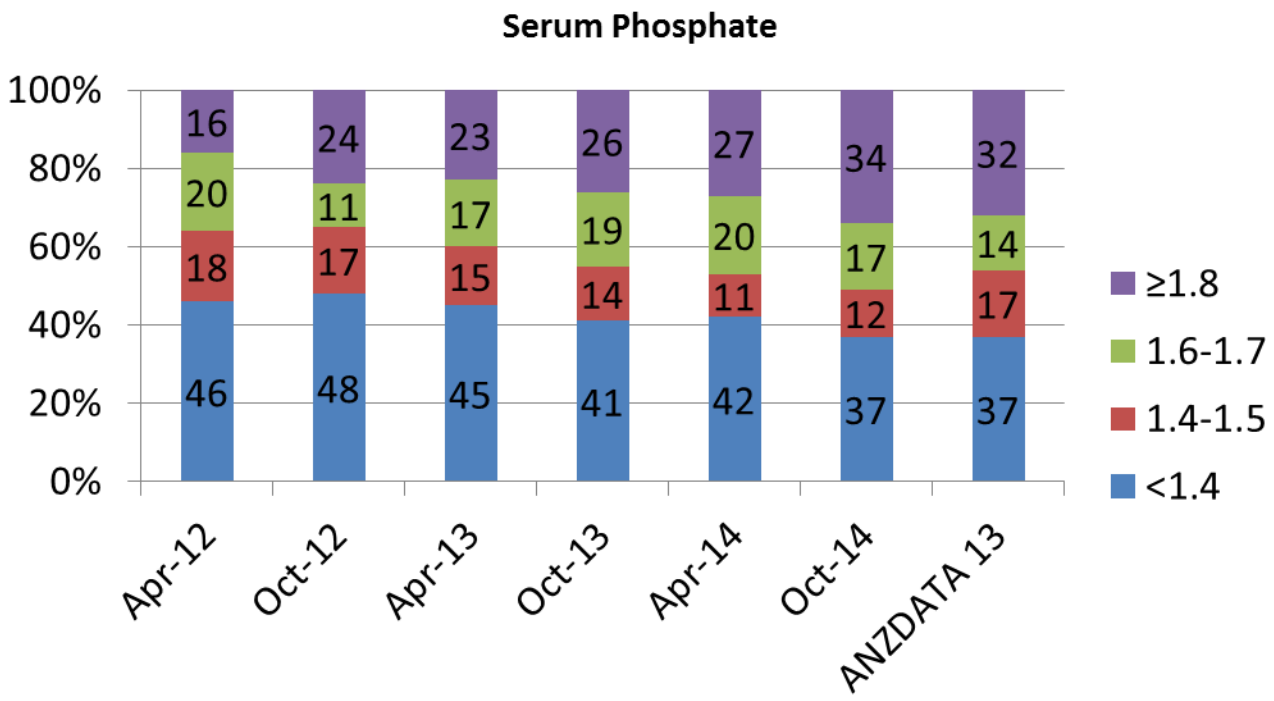


Figure 9. Serum Phosphate target levels from 2012 to 2014 versus ANZDATA

The calcium phosphate product remained similar to previous years and were at or slightly better than national ANZDATA targets.

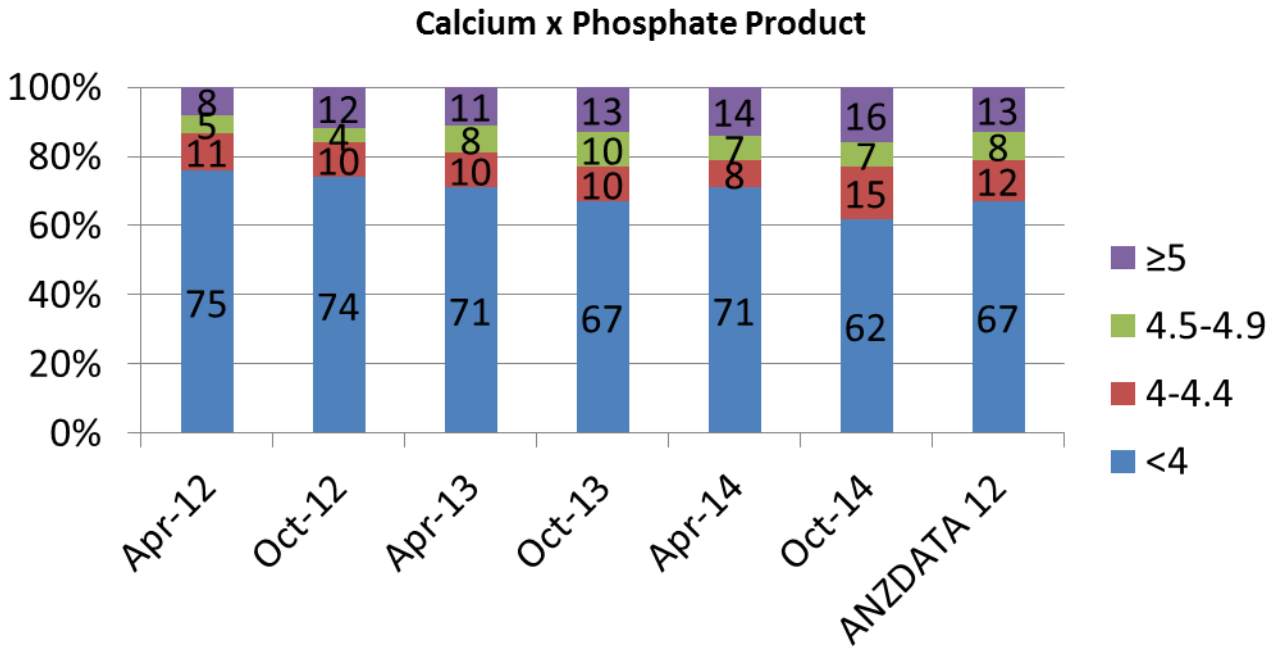


Figure 10. Calcium Phosphate Product by year and compared to ANZDATA

Blood Lipid Targets

Data are collected only on patients who started dialysis on lipid reduction medications or with, or suspected of being high risk or having, coronary artery disease, peripheral vascular disease, cerebrovascular disease or diabetes.
ANZDATA does not collect lipid levels.

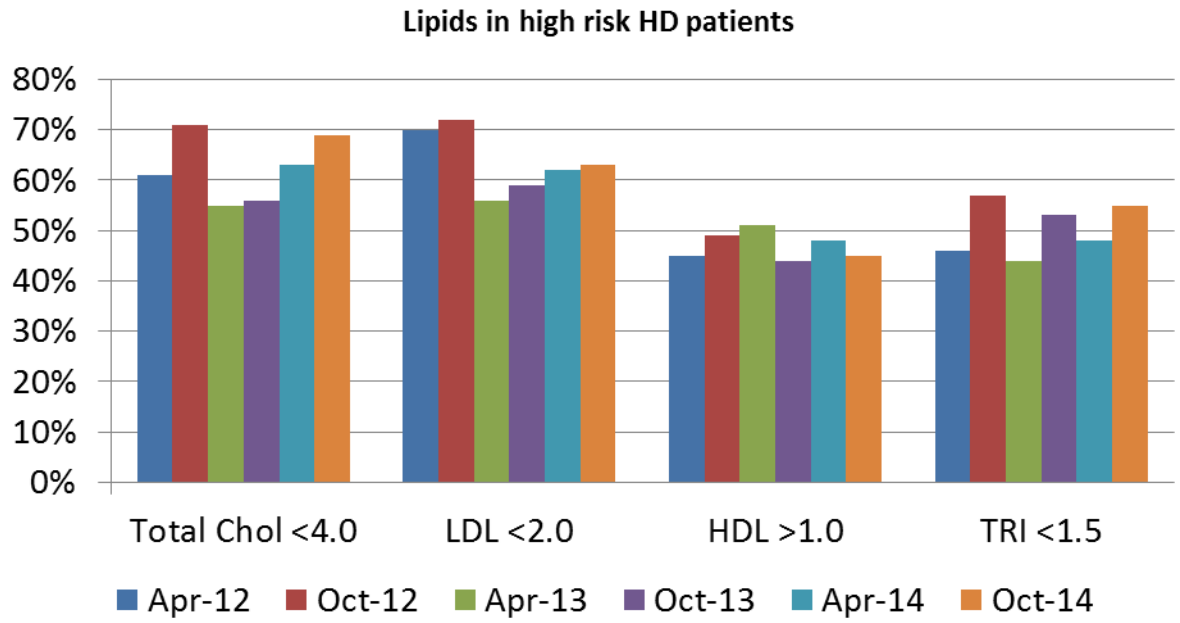
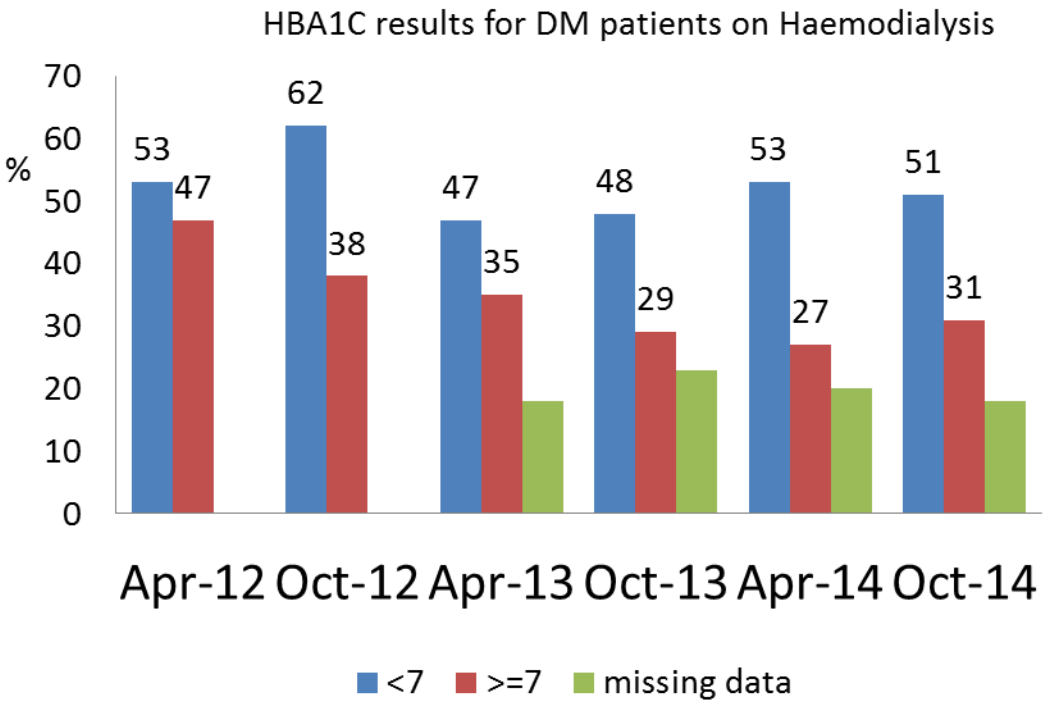


Figure 11. Lipid levels for high risk Haemodialysis patients

Diabetes Control measured by HbA1c



Note: Only 80% of diabetic patients on dialysis had an HbA1c measured.

Figure 12. HbA1c for Diabetes patients on Haemodialysis

Based on an HbA1c level <7% around half of the patients with diabetes are having adequate control.
ANZDATA does not record HbA1c levels on dialysis patients.

Conclusions

- Survival outcomes for patients are the same and appear to be slightly better than the National average at 1 year, 3 and 5 years
- Dialysis adequacy as measured by Urea Reduction Ratio (URR) >65% was equivalent to the National Average (94% STG vs. 92% Australia)
- Thirty one percent (31%) of in-centre or satellite haemodialysis achieve the KPI of >15 hours on dialysis per week which is slightly below the national average of 36%.
- Targets for the biochemical markers of renal bone mineral disease were similar to or slightly better for St George haemodialysis (STG) compared with the national average measure by ANZDATA i.e. serum corrected calcium (41% vs. 37%), serum phosphate (54% vs. 53%) and calcium phosphate product (62% vs. 47%).
- Measurement of serum iron stores were similar for both STG HD and ANZDATA. i.e. serum ferritin (71% vs. 56%) and iron transferring saturation (both 66%)
- Our haemoglobin levels appear to be similar to the national average
- Erythropoietin use was slightly lower with 80% on an ESA vs. 87% on ANZDATA
- Activity increased throughout 2014 with an overall growth of 13% across the sites and currently there is a need to increase capacity to handle new patients with the establishment of a nocturnal dialysis shift for April 2015 and to build a new stand-alone satellite haemodialysis unit

4. VASCULAR ACCESS

Background and Performance Indicators:

- The preferred haemodialysis access is a native AV fistula (KDOQI 2006 & CARI 2012)
- The Vascular Access Nurse (VAN) aims to monitor all fistulas from creation until the commencement of dialysis to ensure maturity as well as ensuring fistula maintenance after dialysis has commenced and ensuring a low level of fistula and vascath infections.

Data Benchmark:

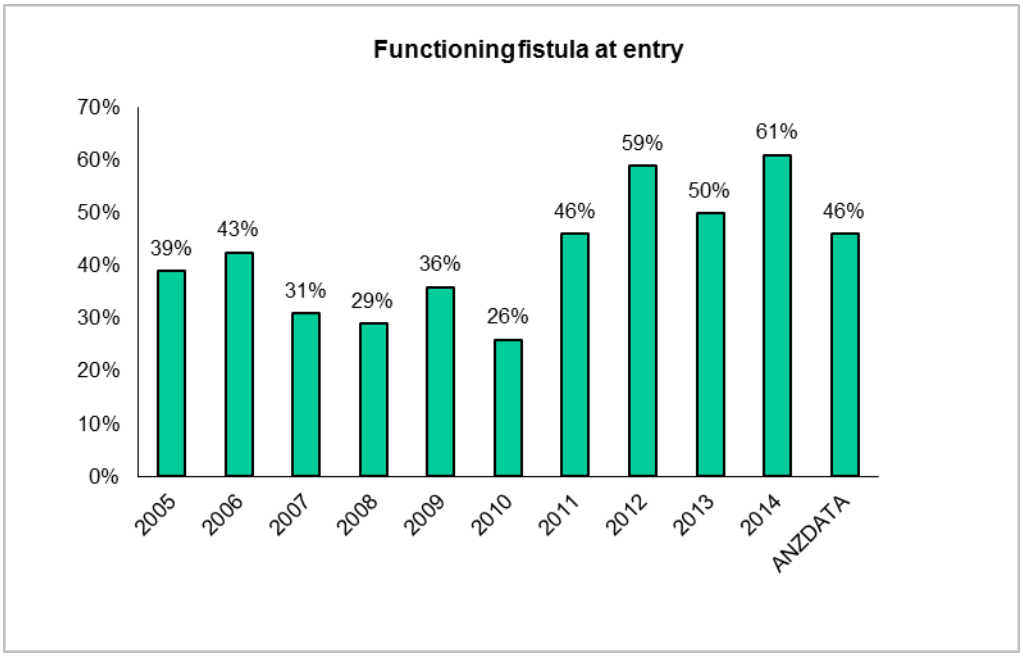
- Data is benchmarked against ANZDATA 2013 report, KDOQI 2006 and CARI 2012 guidelines.

- The key performance measures for vascular access are:

    1. > 46% patients commencing haemodialysis with a functioning access (ANZDATA 2013)
    2. > 78% of prevalent patients dialysing through a native fistula (ANZDATA 2013)
    3. < 10% of prevalent patients dialysing through a permanent catheter (KDOQI 2006)
    4. < 1% fistula infection rate during the useful life of the access (AVF) (KDOQI 2006)
    5. < 10% fistula infection rate during the useful life of the access (AVG) (KDOQI 2006)
    6. > 3.0 years AVF patency and 2.0 years AVG patency (KDOQI 2006)
    7. < 0.25 episodes/pt-year at risk for fistula thrombosis (KDOQI 2006)
    8. < 0.5 episodes/pt-year at risk for graft thrombosis (KDOQI 2006)
    9. < 1.5 episodes/1000 catheter days tunnelled catheter infection rate (KDOQI 2006)

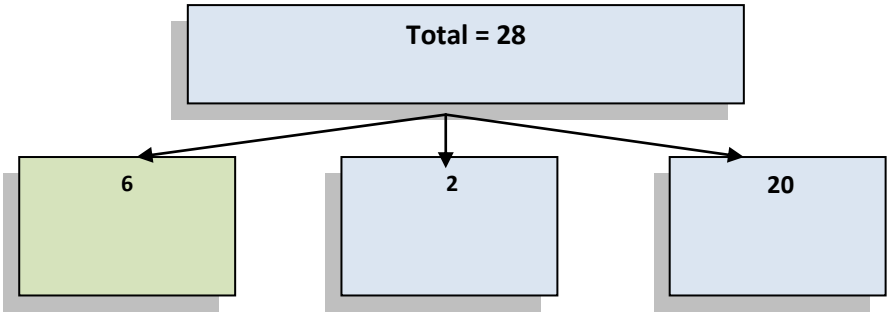
Vascular Access at Commencement of Haemodialysis:

The national average was 46% for patients having a functioning access at first dialysis (ANZDATA 2013).

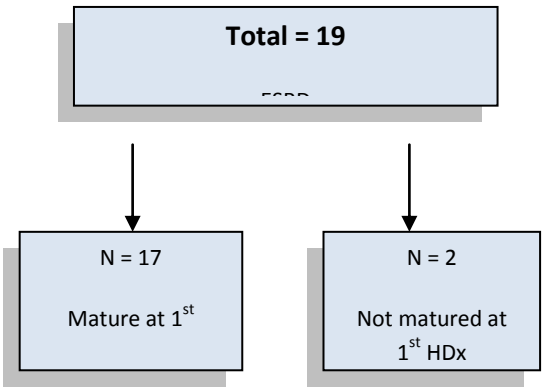


- **In comparison, 61% patients had a functioning access at first dialysis**

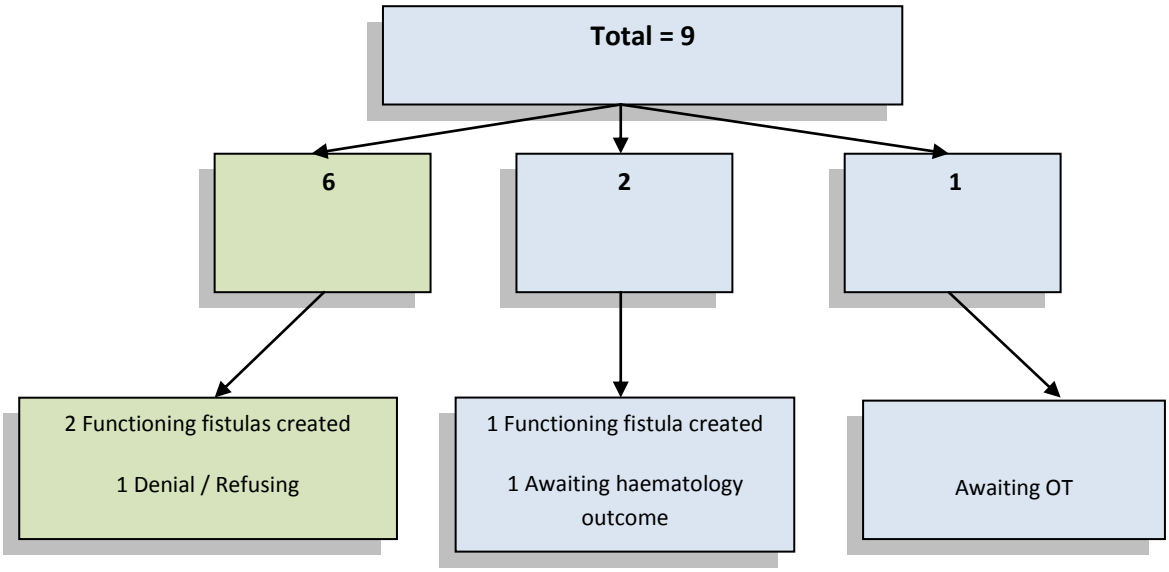
Patients new to haemodialysis in 2014:



Access created before 1st haemodialysis:



No access created before 1st haemodialysis:



Comments:

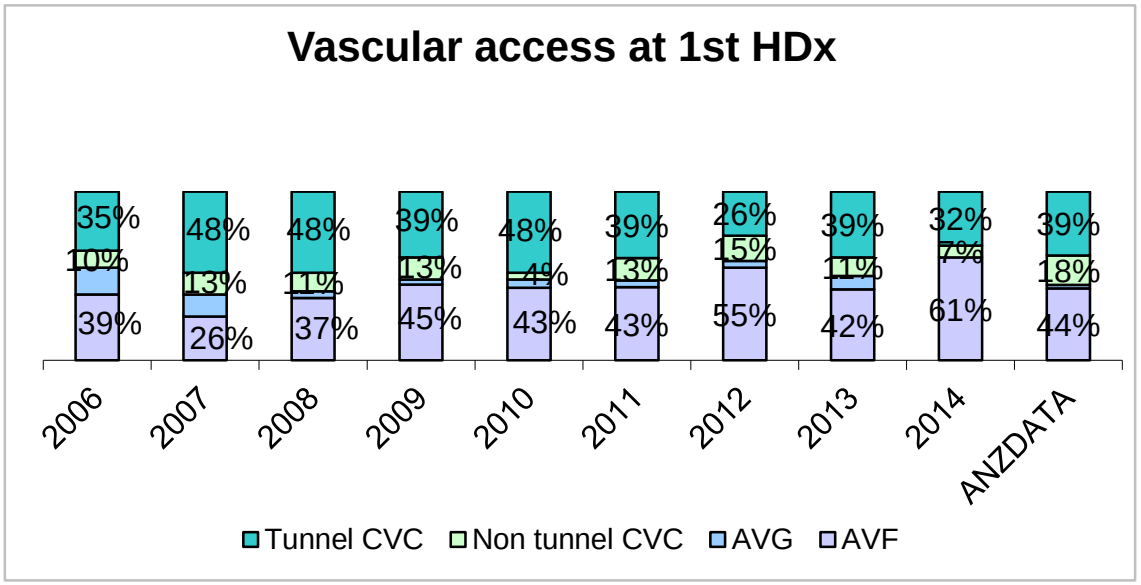
- **17 (77%)** patients had a mature access at their first haemodialysis **(excluding late referrals) compared to 53% in the ANZDATA report.**

Identified strengths and weakness:

- The late referral rate at St George was the same as the ANZDATA report (21%).
- Average time from initial referral to access creation was 40 days.
- The aim is to have access created within 30 days of initial referral.
- Average time to first cannulation in 2014 was 7.4 months.

Vascular Access at 1st HDx:

ANZDATA (2013) benchmark: 44% commenced with a native fistula (AVF) and 2% with a graft (AVG) equating to 46%.



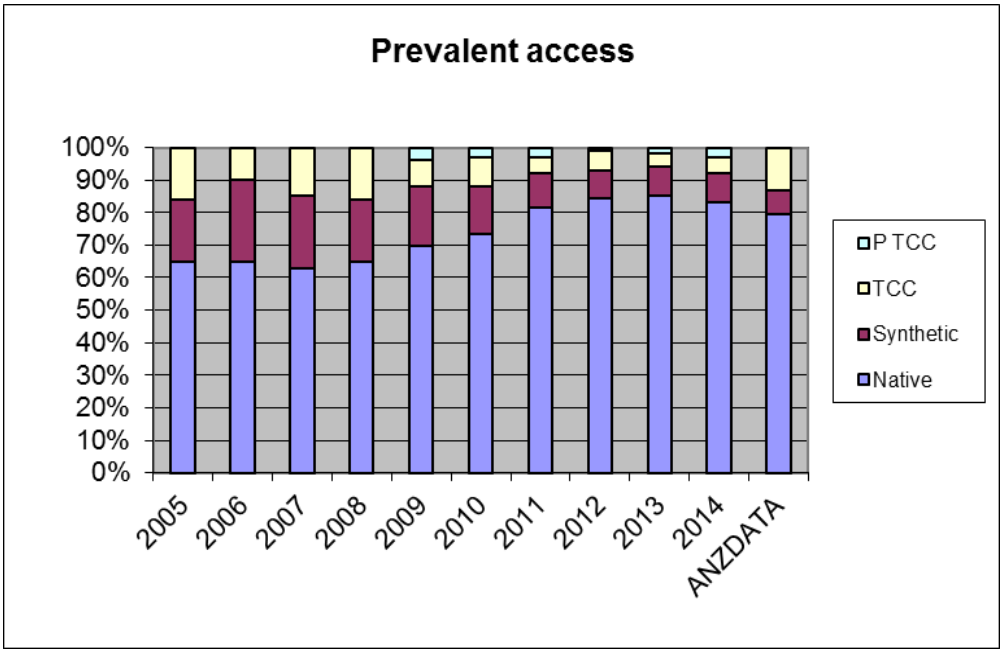
Comments:

- In comparison, St George Hospital Renal Dept achieved 61% with a native fistula compared to the ANZDATA benchmark of 46%.

Access type:

- KDOQI (2006) recommends fistula use in 40% of prevalent patients
- ANZDATA set a benchmark of 78% for fistula use (ANZDATA 2013)
- KDOQI (2006) suggest < 10% of patients have a permanent catheter
- ANZDATA set a benchmark of 13% for tunnelled catheter use (ANZDATA 2013)

Prevalent Data: (n = 211)



Comments:

- 83% of St George patients were using a fistula for haemodialysis, compared to the ANZDATA benchmark of 78% and KDOQI benchmark of 40%
- 3% of St George patients were using a permanent catheter which is less than the KDOQI benchmark of < 10%
- A total of 8% of tunnelled catheter were used which is less than the ANZDATA benchmark

Access Infection Rates:

KDQOI (2006) recommends infection rate for fistula < 1% and graft < 10% during the useful life of the access.

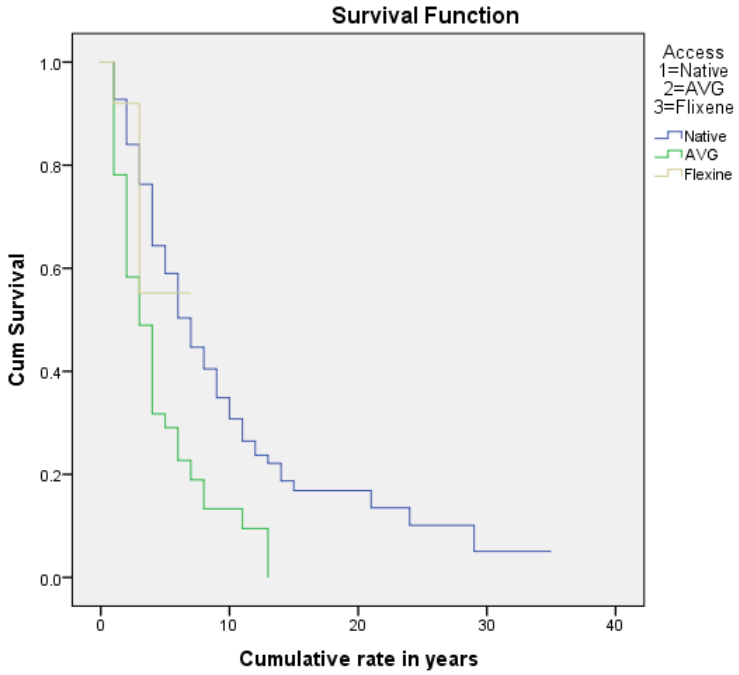
	Blood stream infection (BSI) range AVF/SVG	Blood stream infection (BSI) range AVG
2014	**0 BSI (0 BSI/100 pt months)**	**0 BSI (0 BSI/100 pt months)**
2013	1 BSI (0-0.15 BSI/100 pt months)	2 BSI (0-2.3 BSI/100 pt months)
2012	1 BSI (0-0.07 BSI/100 pt months)	1 BSI (0-0.59/100 pt months)
2011	2 BSI (0-0.53 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)
2009	4 BSI (0-0.76 BSI/100 pt months)	3 BSI (0-1.15 BSI/100 pt months)
2008	1 BSI (0-1.3 BSI/100 pt months)	3 BSI (0-0.8 BSI/100 pt months)
2007	3 BSI (0-1.32 BSI/100 pt months)	10 BSI (0-4.97 BSI/100 pt months)

Comments:

- St George Hospital and Sutherland Dialysis Unit patients meet the KDOQI benchmark infection rate for fistulas and grafts. This data does not include home haemodialysis patients.

Access survival:

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



Comments:

- Cumulative assisted patency is defined as the number of accesses which remain patent regardless of number of interventions during a time period.
- Data includes current and deceased patients since 2004.
- Endpoint was access lost, death with a functioning fistula, transplanted or transferred.
- Cumulative proportion surviving at end of the above intervals
  - AVF at 3 years: 64%
  - AVG at 2 years: 49%
  - Flexine at 2 years: 55%
- Median survival time
  - AVF = > 6.1 years, AVG = > 2.9 years, Flexine = > 6.0 years
- No changes compared to previous year results

Thrombosis events:

The KDOQI (2006) guidelines:

- fistula thrombosis rate of < 0.25 episodes/pt-year at risk
- graft thrombosis rate of < 0.5 episodes/pt-year at risk

Thrombosis events:			
	AVF	AVG	Ave/mth
2014	14	13	2.25
2013	8	12	1.67
2012	9	10	1.67
2011	6	16	1.8
2010	8	21	2.4
2009	10	24	2.8
2008	14	25	3.3

Comments:

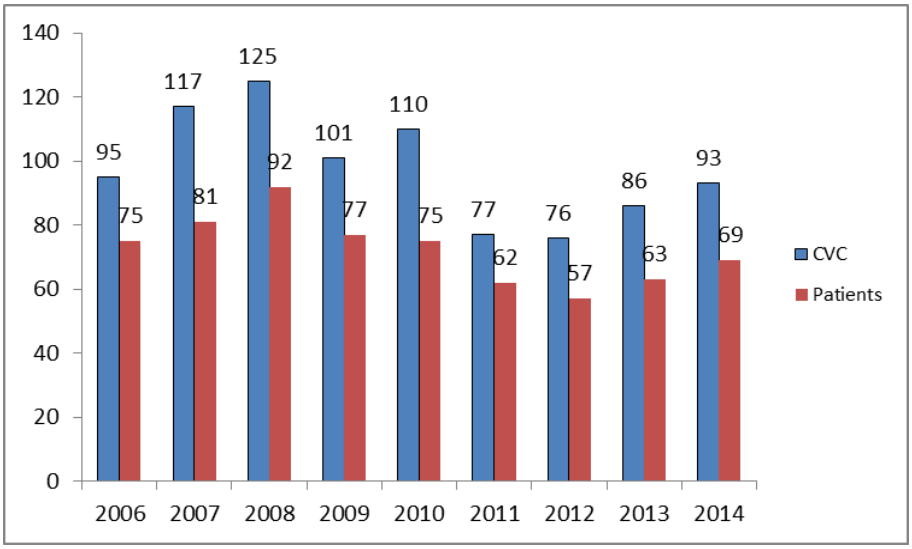
- **Thrombosis rate for St George Hospital is meeting target for AVF but not for AVG/SVG:**
  - **AVF = 0.09 episodes/pt-year**
  - **AVG/SVG = 0.84 episodes/pt-year**
- Average 2.25 thromboses per month across all fistula types

Central Venous Catheters:

Background

- Tunnelled cuffed catheters (CVC) are used to provide temporary access for both acute and chronic haemodialysis patients, including those with a primary AVF still to mature (KDOQI, 2006)

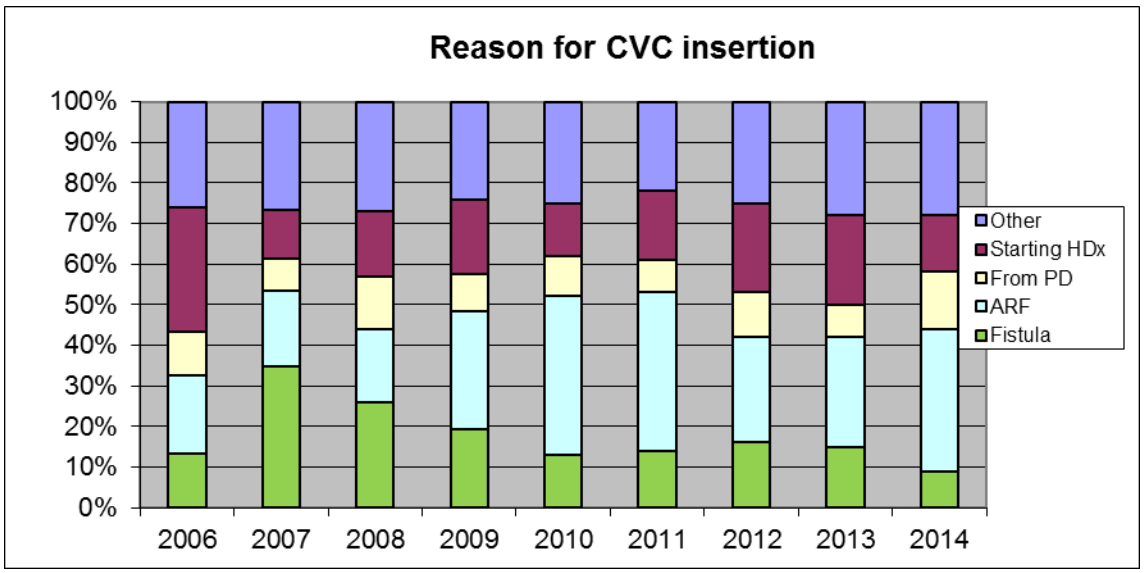
Activity Level:



Comments:

- Total days all catheters in situ = 4584 days (2014) compared to 4404 days (2013)
- **21 %** of catheters placed in chronic patients in 2014 (15/93) as compared to **29%** in 2013 (excluding replacements, fistula and PD issues)

Reason for insertion of catheters:



Comments:

- Fistula group includes immature, revision, thrombosed or unsalvageable
- Other includes replacing a non-tunneled catheter with a tunneled catheter or else malfunction, occlusive thrombus or infection
- Only 1% of catheter complications related to insertion
- Average days in situ = 49 (2014), compared to 51 (2013) and 46 days (2012)
- Reduction in number of fistula issues requiring vascath insertion compared to 2012 and 2013

Catheter infection rates:

KDOQI (2006) recommends a catheter related bacteraemia rate < 1.5 episodes/1000 catheter days

	Catheter related bacteraemia (CRB) rate	Exit site infections (ESI) rate
2014	**1.1% (0.22 episodes/1000 catheter days)**	**6.5% (1.31 episodes/1000 catheter days)**
2013	1.2% (0.16 episodes/1000 catheter days)	2.3% (0.45 episodes/1000 catheter days)
2012	3.9% (0.62 episodes/1000 catheter days)	6.5% (1.18 episodes/1000 catheter days)
2011	1% (0.11 episodes/1000 catheter days)	6% (0.63 episodes/1000 catheter days)
2010	4% (0.69 episodes/1000 catheter days)	5% (0.82 episodes/1000 catheter days)
2009	7% (0.57 episodes/1000catheter days)	13% (1.1 episodes/1000catheter days)
2008	10% (0.74episodes/1000catheter days)	10% (0.8 episodes/1000catheter days)
2007	6% (0.72 episodes/1000catheter days)	10% (1.24 episodes/1000catheter days)
2006	13% (1.05 episodes/1000catheter days)	11% (0.88 episodes/1000catheter days)
2005	28% (3.0 episodes/1000catheter days)	17% (1.7 episodes/1000catheter days)

Comments:

- This benchmark for CRB is being met (CRB 0.22)
- For 2014, 1 catheter-related and 6 exit-site infections for a total of 93 catheters in situ
- The gentamicin/heparin lock continued to be utilised as a recommended means to reduce CRB and exit site infections rates (KDOQI, 2006)
- A gentamicin/normal saline lock was introduced for the first week post insertion to help reduce the risk of bleeding
- Potential for emergence of antimicrobial resistance (CARI, 2012) - random gentamicin levels of <0.4 mg/L indicates toxicity is unlikely

Future plans:

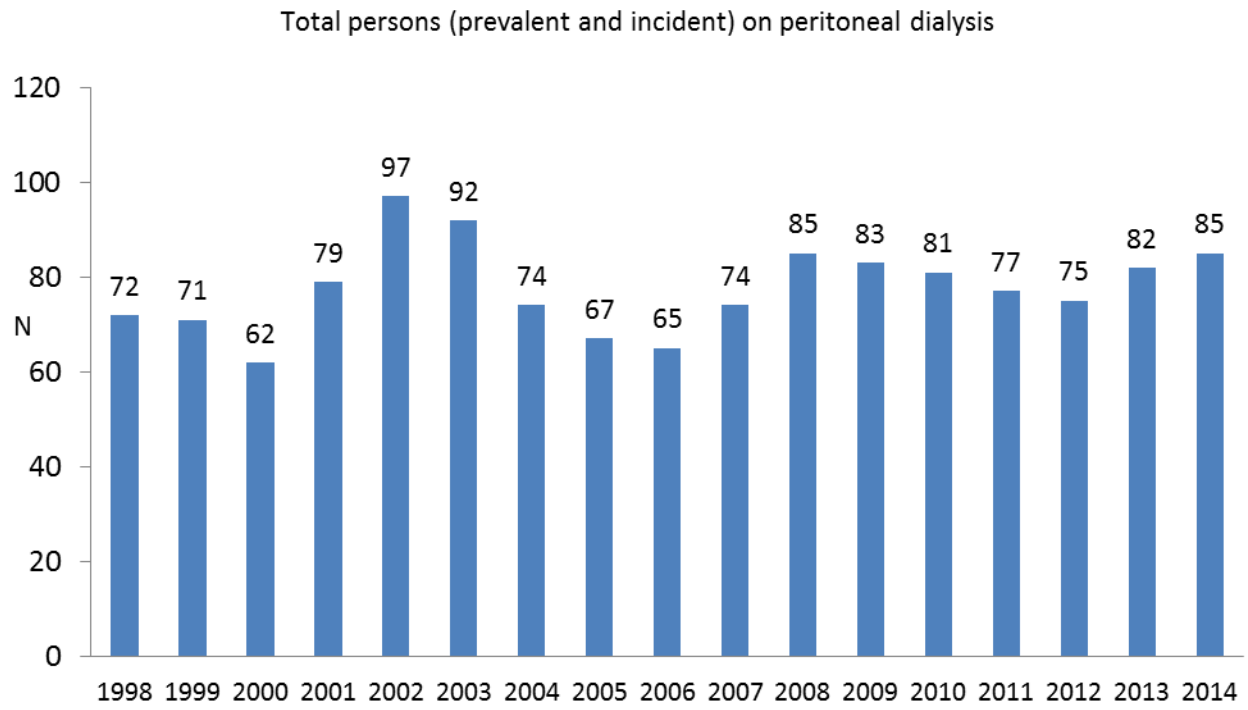
- Vascular Access Clinic will continue and has had excellent feedback via patient satisfaction surveys utilising the PET device
- Quarterly Nephrologist/Vascular Surgeon meeting will continue
- Bi-monthly Renal Infection review meeting with Infection Control CNCs will continue
- VA PD group will continue to produce the bi-monthly newsletter for staff and ensure vascular access protocols continue to be in line with best practice
- Evaluation of Vascular access learning package with pilot group

5. Peritoneal Dialysis

Claire Cuesta, Sharon Ong and PD team

Peritoneal dialysis was used to treat 21% of all dialysis patients in St George compared to 19% reported on the 36th Annual ANZDATA report (2013).

A total of 85 patients were on PD in 2014 (including hospital IPD) compared to 82 in 2013. In December 2014, the proportion of patients receiving automated peritoneal dialysis (APD) was 95%, and the proportion of continuous ambulatory peritoneal dialysis (CAPD) was 5%. Our APD population continues to be above the proportion reported by ANZDATA of 62%.



APD	*ANZDATA 62% (1374/2227)*	*St George 95% (55/58)*
CAPD	*ANZDATA 38% (853/2227)*	*St George 5% (3/58)*

PD patient flow

Peritoneal dialysis patients as at 31.12.2013 (n=64)

In			
	New Patients	*18*	
	Transfer from another hospital	*0*	
	Returns from HD	*2*	
	On hospital IPD	*3*	
	Returns from dialysis break	*1*	
	In Subtotal		*24*
Out			
	Transplants	*6*	
	Transfer to other units/overseas	*3*	
	Transfer to Home Haemodialysis	*0*	
	Temporary Transfers to Haemodialysis	*2*	
	Permanent Transfers to Haemodialysis	*15*	
	Return of renal function	*1*	
	Withdrawal from dialysis	*0*	
	Deaths on PD	*3*	
	Out Subtotal		*30*
	Net loss	*6*	
	PD patients December 31st 2014		*58*

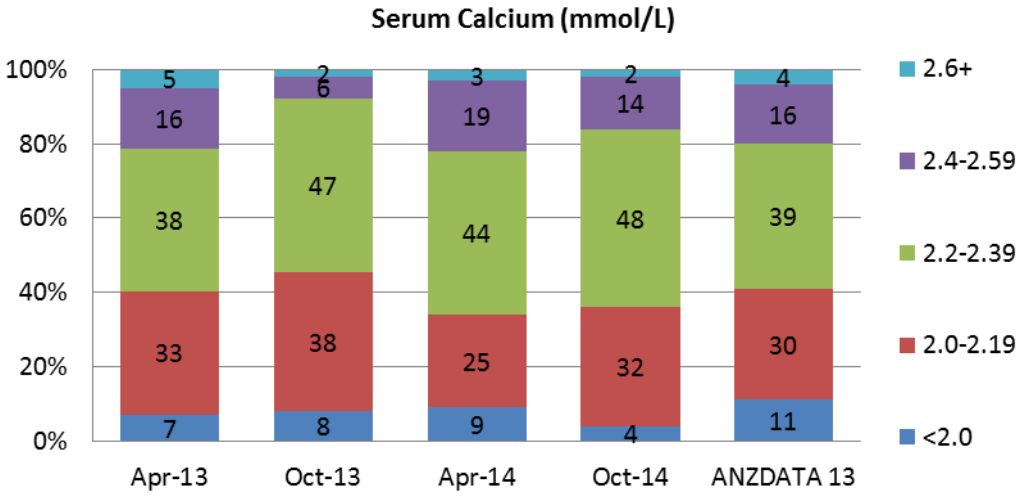
KPIs

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

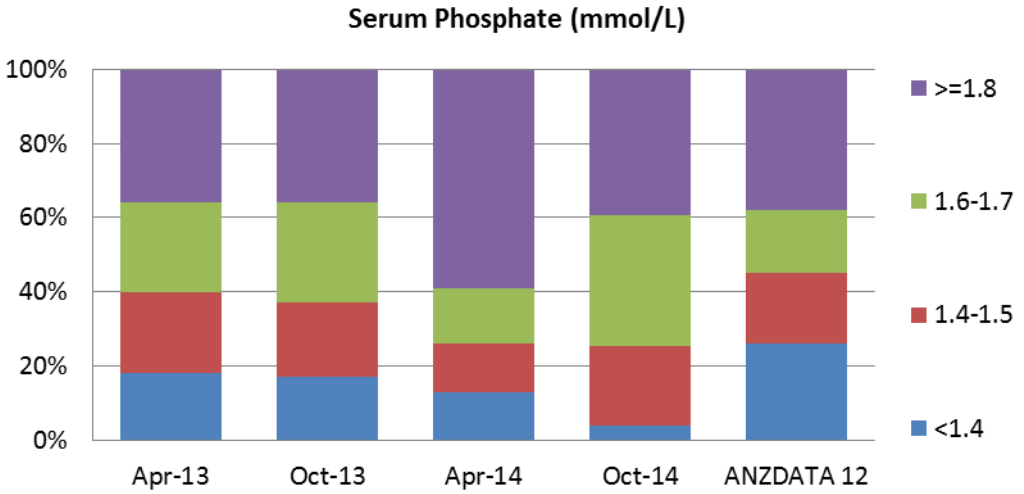
1. Biochemical targets

Parameter	Target	Apr 13	Oct 13	Apr 14	Oct 14	ANZDATA 13
Corr Ca	2.1-2.4 mmol/L	34	50	40	38	-
PO4	0.8-1.6 mmol/L	42	53	42	27	45
$CaPO_4$	<4.0 mmol/L	40	50	31	34	62
Albumin	33-48 g/L	44	29	30	29	-
PTH	7-45 mmol/L	67	58	63	69	-

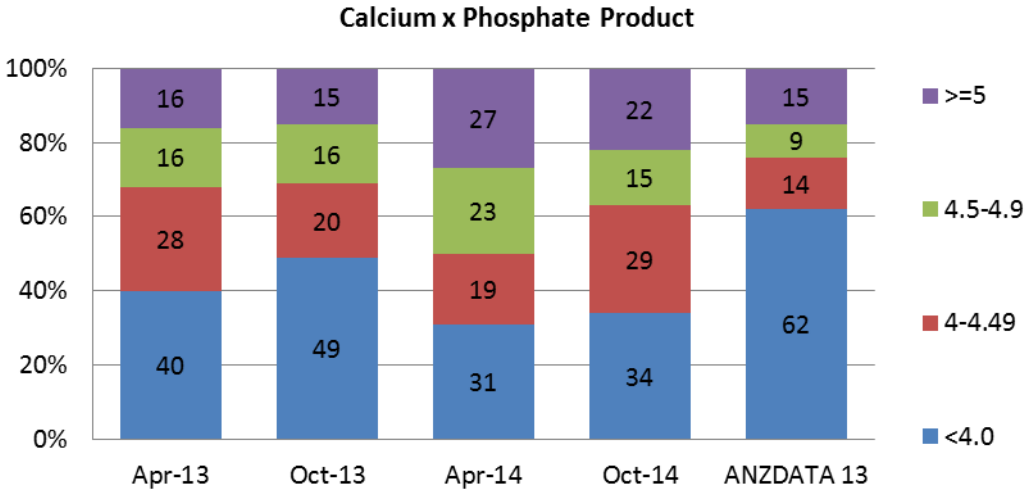
- Serum Calcium
  - 38 % of patients achieved the target for serum corrected calcium in October 2014, however, the ANZDATA benchmark is for uncorrected calcium only.
  - 63% of patients have serum Ca level 2.2-2.4 in October 2014. The mean calcium result is 2.25 (min 1.83, max 2.6)



- Phosphate
  - Our profile for serum phosphate did not match the national data (ANZDATA). The median phosphate result in October 2014 was 1.71 mmol/L (min 1.33, max 3.31).



- Calcium Phosphate Product
  - Calcium x phosphate product did not match the data from ANZDATA in October 2014. The median calcium x phosphate product is 4.16 (min 3.18, max 8.51)

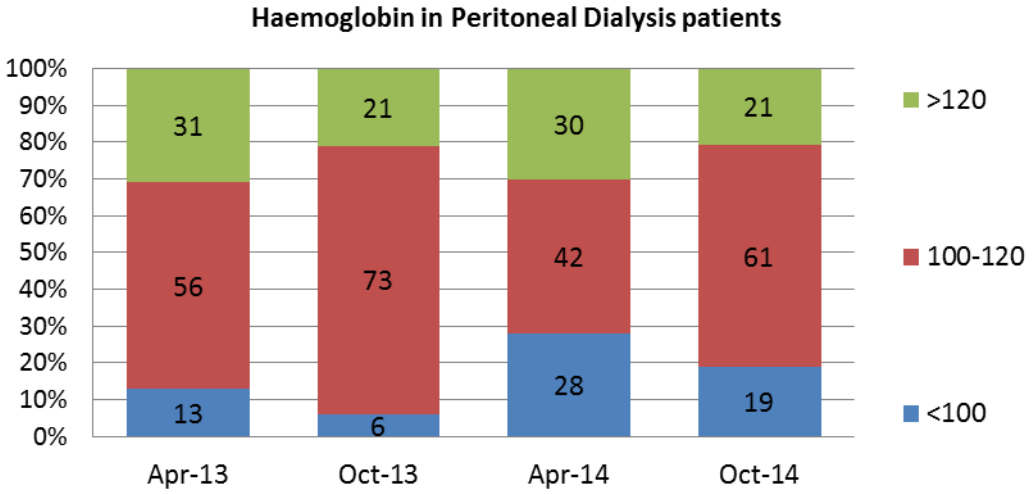


- Albumin
  - 29% of PD patients had an albumin level within 33-48 g/L in October2014, similar to last year's result. 30% of PD patients had albumin level 30-32 g/L and mean albumin level was 30 g/L (min 20, max 41). We are continuing to address this issue, the annual review of PD patients by the dietitian is gradually progressing to 6-monthly in 2014 which correlates with the 6-monthly biochemistry audit.

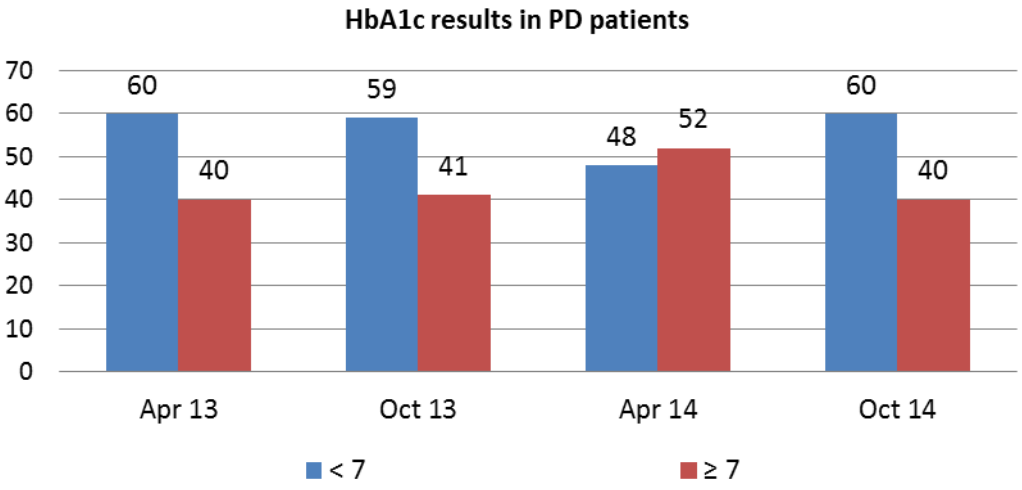
- PTH
  - In October 2014, 69% of PD patients had PTH 7-45 mmol/L, an improvement from previous year's result of 59%. The median PTH result in October 2014 was 26mmol/L (min 1.1, max 150.8).

2. Haematological targets

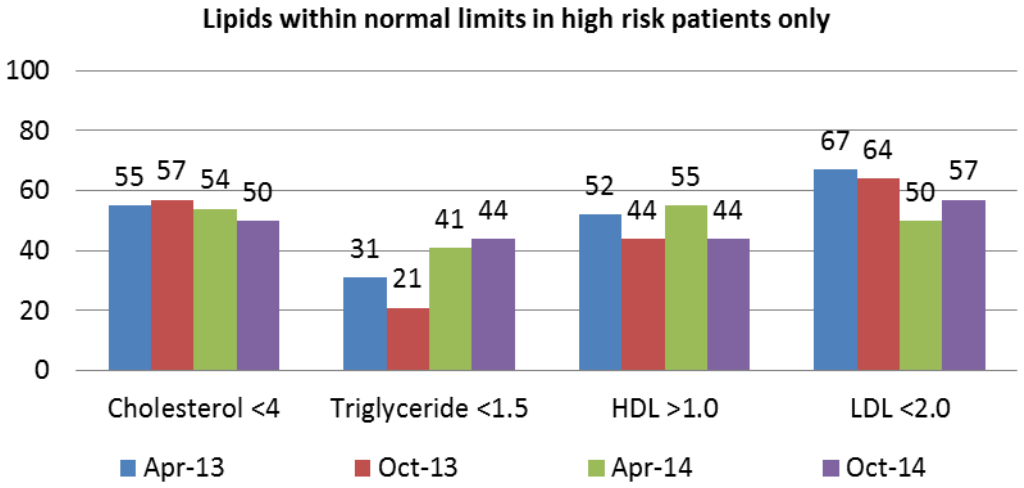
- Haemoglobin
  - 61% achieved our target of 100-120 g/L in October 2014
  - In October 2014, 82% of PD patients with Hb <100 were receiving erythropoiesis stimulating agents (ESA). Half of the patients with high Hb (>120) were also receiving ESA. The ESA dose was reduced or stopped for these patients. 27% of patients who had Hb below 100 g/L had iron studies above or below the target range (ferritin 200-800 ug/L and transferrin 20-50%).



- HbA1c (Glycosylated Haemoglobin)
  - In October 2014, 50% of peritoneal dialysis patients had diabetes. 97% diabetics were screened for HbA1C with the median result of 6.7%, minimum 5.3%, maximum 15.4%. 60% of the patients screened had results below 7, similar to the previous years.

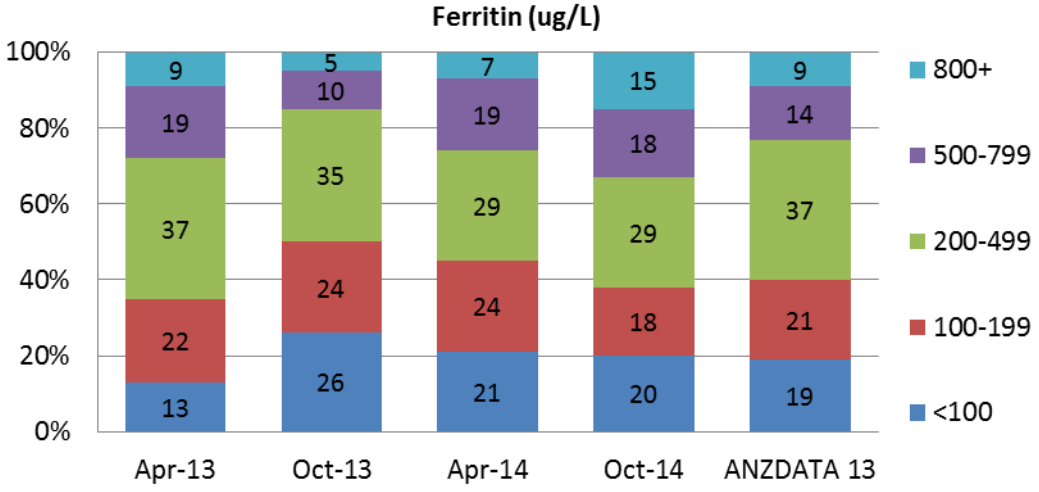


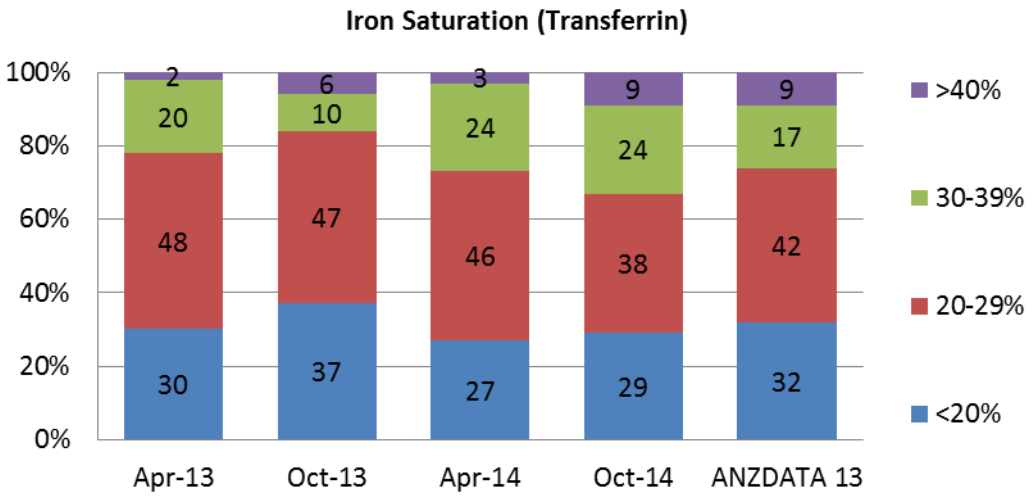
- Lipids
  - Lipid studies were collected for high-risk patients (70% PD patients or n=39); these include patients having or suspected of having diabetes, coronary artery disease, cerebrovascular disease and peripheral vascular disease. Triglyceride improved from previous year whilst total cholesterol results remain stable.



- Iron
  - Iron replete refers to ferritin levels between 100-800ng/mL as well as iron saturation between 20-50%. 63% of PD patients were iron replete in October 2014 compared to 52% in October 2013

Parameter	Target	Apr 13	Oct 13	Apr 14	Oct 14	ANZDATA 13
Ferritin	200-800 ug/L	59	50	48	48	51
Transferrin	20-50%	70	63	70	68	68

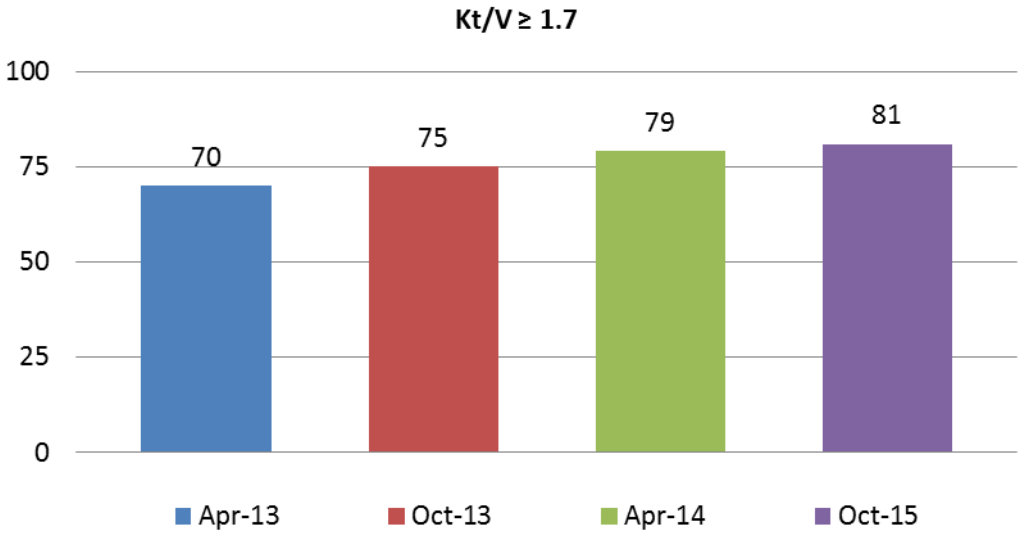




3. Dialysis Adequacy

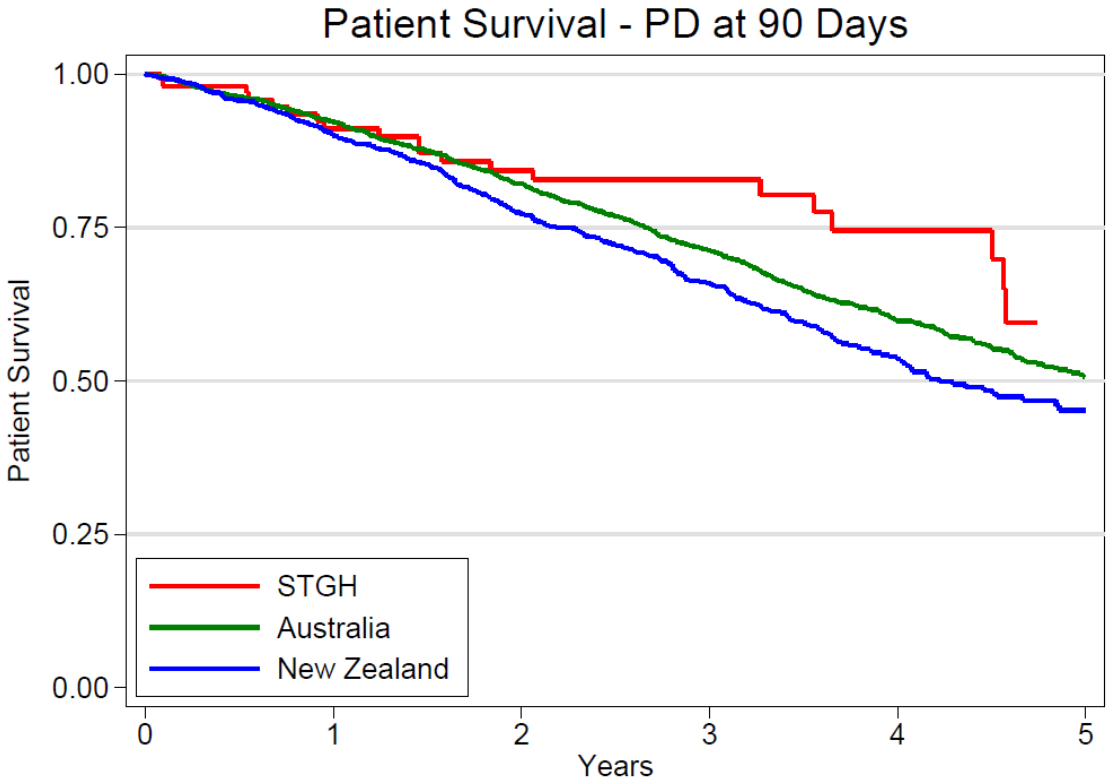
- Peritoneal dialysis adequacy was measured using Kt/V and was benchmarked against the KDOQI target of at least 1.7 per week. A slight improvement was seen over the audit periods. In October 2014, the median Kt/V was 2.20 (min 1.18, max 4.87).

Parameter	Target	Apr 13	Oct 13	Apr 14	Oct 14
KT/V	≥ 1.7	70	75	79	81
CCL	>50L (L & LA) or >60L (H & HA)	67	77	66	58



4. Patient and Technique Survival

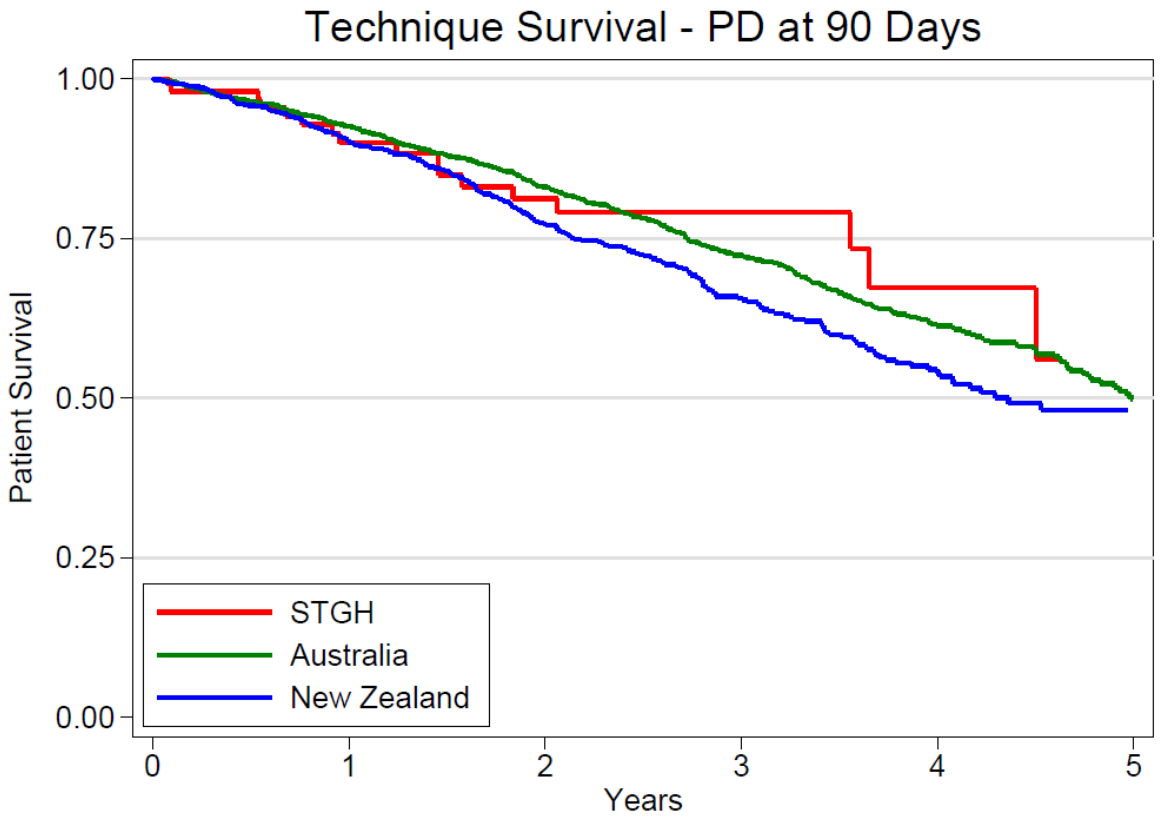
- The 5-year PD patient and technique survival data from 2008-2013 were provided by the ANZDATA registry. The 5-year patient and technique survival rates for those on PD for more than 2 years were significantly better than the national rates for both Australia and New Zealand. 10 yr. data are similar.



PD Patient survival – PD at 90 days. ANZDATA individual hospital report 2008-2013

Table 23: PD patient survival

	STGH		Australia		New Zealand	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	110	100.0	3821	100.0	1216	100.0
3 months	95	98.1 (92.5-99.5)	3492	98.1 (97.7-98.5)	1121	98.4 (97.5-99.0)
6 months	88	98.1 (92.5-99.5)	3140	96.3 (95.7-96.9)	1021	95.8 (94.4-96.8)
1 year	74	91.1 (83.0-95.5)	2512	92.2 (91.3-93.1)	843	90.0 (88.1-91.7)
2 years	55	84.3 (74.4-90.6)	1523	82.2 (80.6-83.6)	551	77.3 (74.4-80.0)
3 years	39	82.8 (72.5-89.5)	909	71.3 (69.2-73.2)	329	66.0 (62.4-69.3)
4 years	21	74.5 (60.7-84.1)	470	59.8 (57.2-62.3)	155	53.6 (49.3-57.7)
5 years	7	59.5 (39.6-74.8)	168	50.7 (47.4-53.9)	47	45.2 (40.0-50.3)



PD Technique Survival – PD at 90 days. ANZDATA individual hospital report 2008-2013

Table 19: PD technique survival

	STGH		Australia		New Zealand	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	110	100.0	3821	100.0	1216	100.0
3 months	90	98.0 (92.3-99.5)	3338	98.1 (97.6-98.5)	1089	98.5 (97.7-99.1)
6 months	78	98.0 (92.3-99.5)	2885	96.5 (95.8-97.0)	966	95.8 (94.4-96.8)
1 year	61	89.9 (80.7-94.9)	2142	92.6 (91.5-93.5)	756	90.1 (88.1-91.8)
2 years	38	81.2 (69.4-88.8)	1099	83.1 (81.4-84.6)	441	77.3 (74.1-80.1)
3 years	22	79.1 (66.7-87.3)	561	72.4 (69.9-74.7)	232	65.6 (61.6-69.4)
4 years	8	67.3 (46.8-81.3)	249	61.3 (58.0-64.4)	96	53.9 (48.9-58.7)
5 years	3	56.1 (28.9-76.4)	77	49.8 (44.9-54.5)	26	48.1 (42.1-53.9)

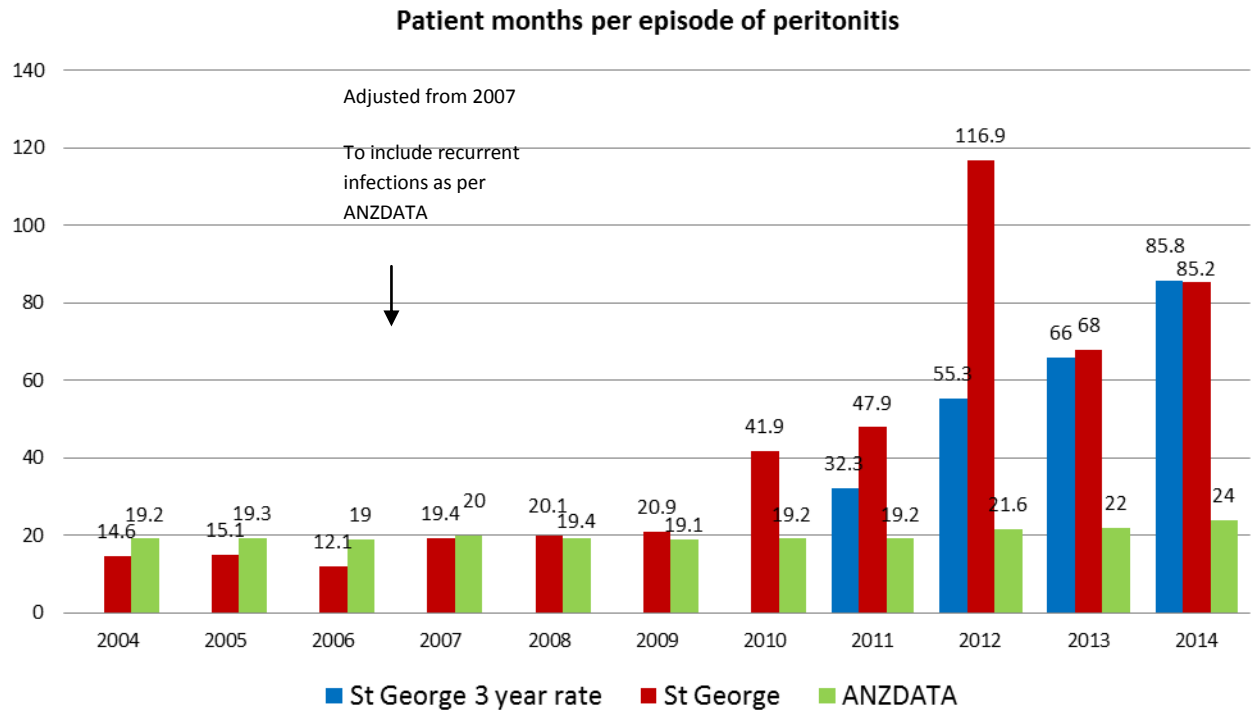
5. Technique Failure

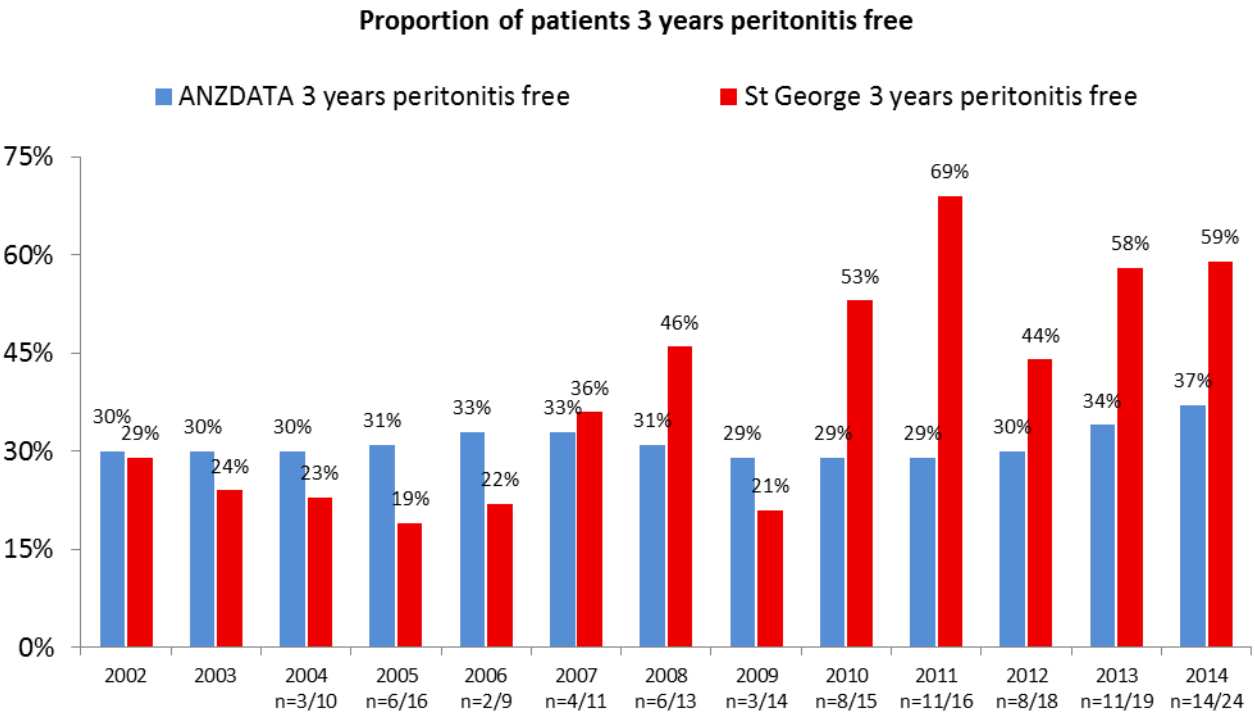
- The commonest primary cause of technique failure (ceasing peritoneal dialysis) was "total dialysis/technical failure" at 39%, followed by infection at 30% (ANZDATA 2013). At St George Hospital, the primary cause of technique failure in 2014 was similar to ANZDATA (2013) with "total dialysis/technical failure" being the main cause at 60%. These were due to unresolved abdominal pain, blocked catheters, membrane failure resulting in inadequate solute clearance, leaks and surgery.
- Seventeen patients were transferred to haemodialysis either temporarily or permanently in 2014. 3 of these patients were transferred to haemodialysis for social reasons mainly due to inability to manage self-care.

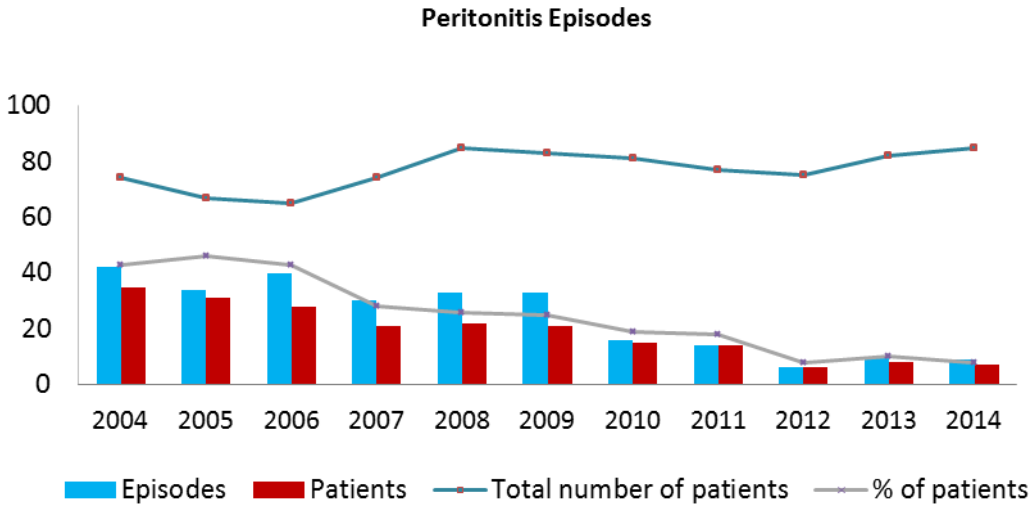
Primary reason for technique failure	St George 2010 n=21	St George 2011 n=11	St George 2012 n=9	St George 2013 n=12	St George 2014 n=17	ANZDATA 2013
Infective	24%	18 %	22%	30%	23%	30%
Total Dialysis/Technical Failure (abdominal pain, inadequate dialysis, leaks, surgery, mechanical, medical)	62%	73%	78%	60%	60%	39%
Social (unable to manage self-care, immobility)	14%	9%	0%	10%	17%	12%
Other causes or unreported cases	0%	0%	0%	0%	0%	19%

6. PD-related Infection rates

- Peritonitis episodes and rates
  - 2014 peritonitis rate results continue to surpass the national benchmark. The St George peritonitis rate over a 3 year period from 2012–2014 improved to 1/86 months. ANZDATA 2013 reports the APD rate at 1/32 months, St George APD rate for 2014 is 1/83 patient months.
  - 79% (46/58) of patients on peritoneal dialysis in 2014 were peritonitis-free
  - The average time on dialysis for current patients who have had peritonitis was 49.7 months, and for those who are peritonitis free was 25 months
  - In 2014, 8 % of our patients could expect peritonitis in any one year compared to 43% 10 years ago. The proportion of peritoneal dialysis patients who were 3 years peritonitis-free was stable at 59%. This was better than the ANZDATA result of 37%.
  - The number of episodes of peritonitis and the number of patients who had peritonitis in 2014 remained low.


Patient months per episode of peritonitis
Adjusted from 2007
To include recurrent infections as per ANZDATA
140
120
100
80
60
40
20
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
14.6
19.2
15.1
19.3
12.1
19
19.4
20
20.1
19.4
20.9
19.1
41.9
19.2
32.3
47.9
19.2
55.3
116.9
21.6
66
68
22
85.8
85.2
24
St George 3 year rate
St George
ANZDATA


Proportion of patients 3 years peritonitis free
ANZDATA 3 years peritonitis free
St George 3 years peritonitis free
75%
60%
45%
30%
15%
0%
2002
2003
2004 n=3/10
2005 n=6/16
2006 n=2/9
2007 n=4/11
2008 n=6/13
2009 n=3/14
2010 n=8/15
2011 n=11/16
2012 n=8/18
2013 n=11/19
2014 n=14/24
30%
29%
30%
24%
30%
23%
31%
19%
33%
22%
33%
36%
31%
46%
29%
21%
29%
53%
29%
69%
30%
44%
34%
58%
37%
59%



Peritonitis episodes

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total patients	74	67	65	74	85	83	81	77	75	82	85
Peritonitis episodes	42	34	40	30	33	33	16	14	6	10	9
Patients with at least 1 episode of peritonitis	n=32 43%	n=31 46%	n=28 43%	n=21 28%	n=22 26%	n=21 25%	n=15 19%	n=14 18%	n=6 8%	n=8 10%	N=7 8%
Patients with at least 1 episode of Exit site infection	n=14 19%	n=16 24%	n=14 22%	n=12 16%	n=12 14%	n=13 16%	n=16 20%	n=16 21%	n=11 15%	n=3 4%	n=8 9%

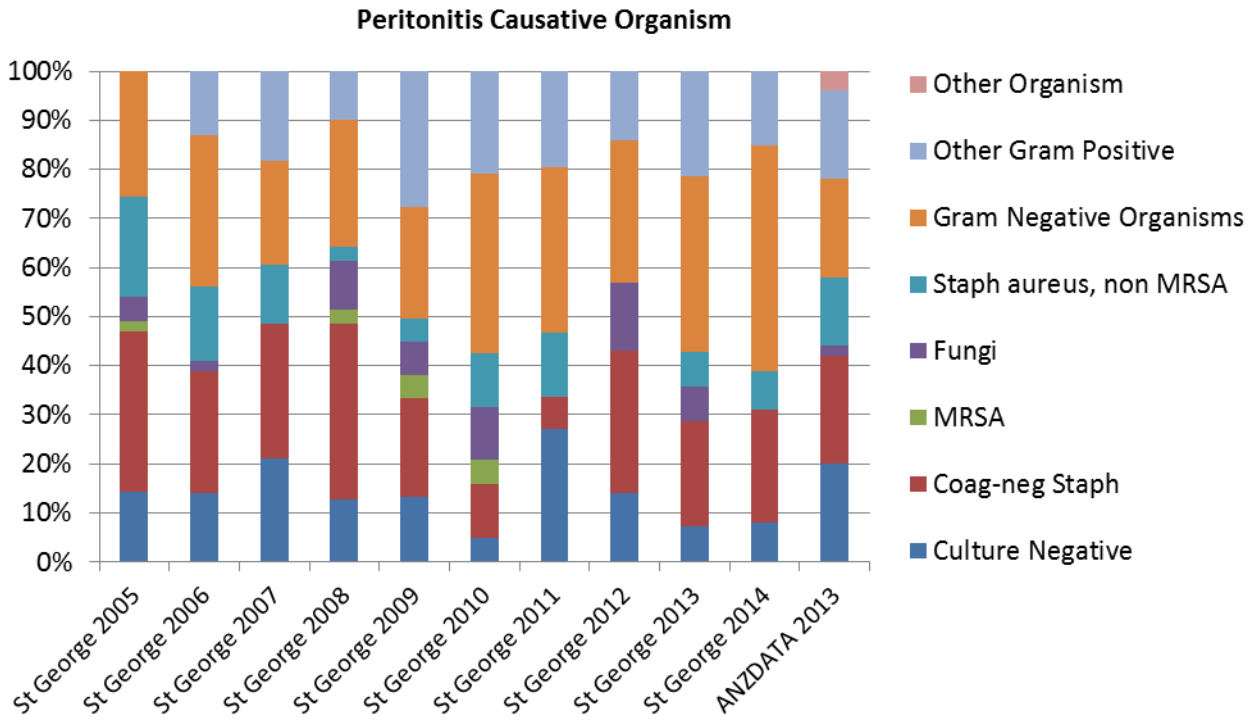
Rates of peritonitis (per patient-year) ANZDATA Individual Hospital Report 2008-2013

	STGH			Australia		
Year	Episodes	Years	Rate (95% CI)	Episodes	Years	Rate (95% CI)
2008	34	55.35	0.61 (0.43-0.86)	1320	2129.29	0.62 (0.59-0.65)
2009	33	57.02	0.58 (0.40-0.81)	1253	2158.50	0.58 (0.55-0.61)
2010	16	56.22	0.28 (0.16-0.46)	1116	2101.19	0.53 (0.50-0.56)
2011	15	55.75	0.27 (0.15-0.44)	876	2007.61	0.44 (0.41-0.47)
2012	6	58.39	0.10 (0.04-0.22)	810	2114.73	0.38 (0.36-0.41)
2013	10	56.58	0.18 (0.08-0.33)	874	2199.26	0.40 (0.37-0.42)
Overall	114	339.31	0.34 (0.28-0.40)	6249	12710.58	0.49 (0.48-0.50)

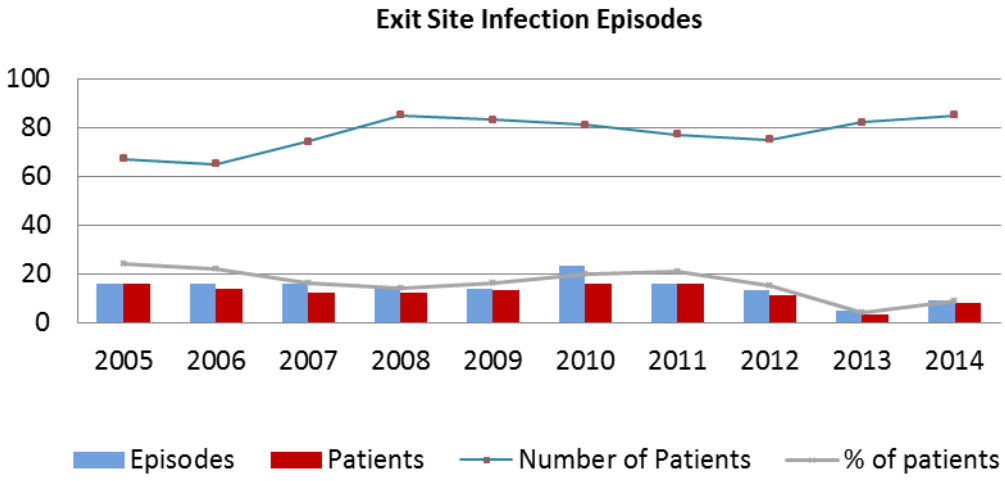
- Change of treatment as a result of peritonitis
  - The peritonitis data was measured to determine the rate of transfer to haemodialysis as a direct result of peritonitis. 3 patients were transferred permanently as a result of peritonitis. The results are listed in the following table:

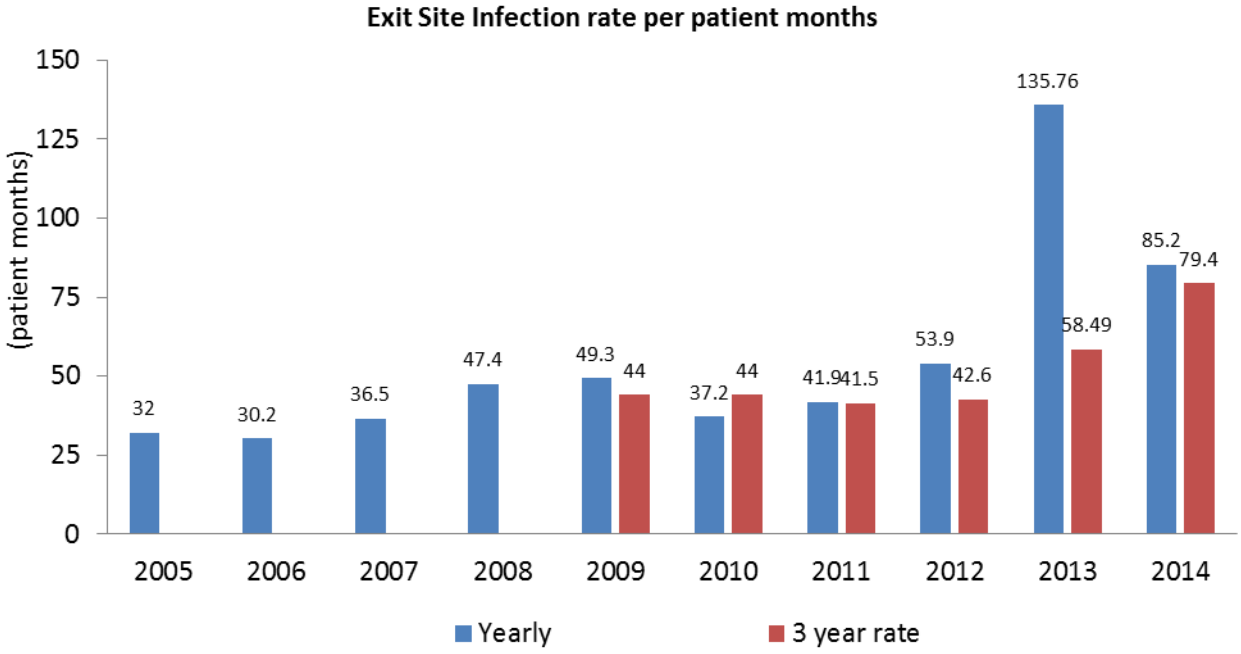
Change in treatment as a direct result of peritonitis (%)	**2007**	**2008**	**2009***	**2010***	**2011***	**2012***	**2013***	**2014***
			**includes recurrent infections*					
Interim Haemodialysis	10	6	0	6	0	0	0	0
Permanent Haemodialysis	13	18	15(5/33)	24(4/17)	14(2/14)	16(1/6)	30(3/10)	33(3/9)
Catheter removed	20	24	15(5/33)	41(7/17)	14(2/14)	16(1/6)	30(3/10)	33(3/9)

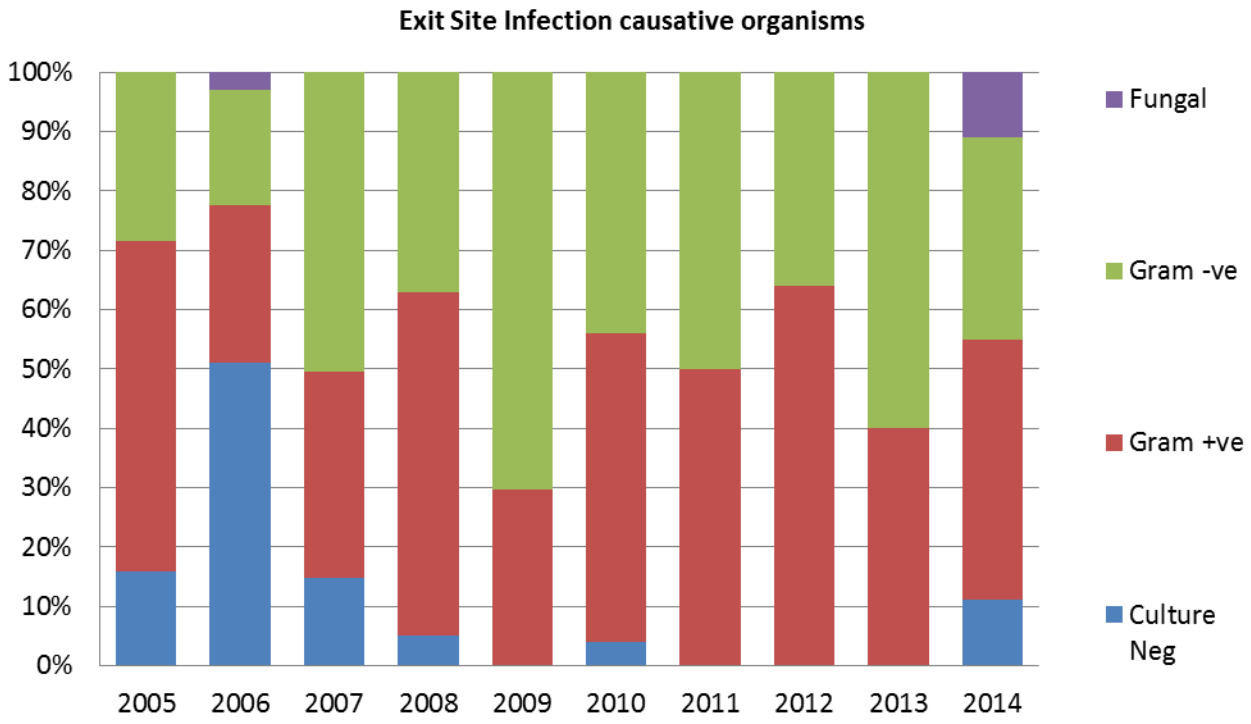
- Main causative organism for peritonitis infections in 2014 was gram negative organisms.
  - There were no MRSA or fungal peritonitis infections in 2014.



- Exit Site Infections (ESI)
  - ANZDATA does not collect data on exit site infections; therefore we can only compare to previous year's result.
  - Gram positive organism was the commonest cause of exit site infection in 2014.
  - 9% of PD patients had exit site infection in 2014 and was lower than our rates of 15-20% in 2010 -2012.







7. Change of Modality and Deaths
    - We have fewer deaths and more transfers to haemodialysis than the national average.

	St George 2011 (%)	St George 2012 (%)	St George 2013 (%)	St George 2014 (%)	ANZDATA 2013 (%)
Transplants	2	5	4	11	9
Change to haemodialysis	17	16	15	26	20
Deaths	7	9	8	5	11

Note: The rates are calculated using the total number of patients on peritoneal dialysis at 31.12.2014 (n=58), 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 continues to be the preferred PD therapy.
3. Iron management, phosphate control and nutrition are ongoing issues which are being addressed with:
    a. Monthly clinical review of PD patients between dietitian, nephrologists and PD nurses
    b. Improved patient monitoring through a structured PD nurse review at renal clinics
    c. Nurse-facilitated iron management for PD patients that has been reinstated from late 2014
    d. 6-monthly dietitian review

4. ***All outcome measures of patient survival, peritonitis and technique survival are better than national outcomes.***
5. The percentage of patients who are peritonitis-free at 3 years was 59% in 2014. This is higher than the ANZDATA result at 37%.
6. Combined peritonitis and exit site infection rates remained lower since data collection in 2005, while the total numbers of patients were stable.
7. Exit site infection episode was slightly higher in 2014 compared to 2013 but remains low in comparison to years before 2012.
8. The rate of failing PD due to "total dialysis and technical failure" was high at 60% in 2014, higher than ANZDATA's reported cases at 39%. Change to haemodialysis rate in 2014 was also higher at 26% than the national rate of 20%. A transition from PD project is underway with the primary purpose of early identification of impending PD failure to facilitate a timely preparation and smooth transition to haemodialysis or conservative care.

Research activities

- St George PD unit is currently participating in PDOPPS (Peritoneal Dialysis Outcomes and Practice Pattern Study), an international study to identify practice patterns that lead to better care and improved clinical outcomes for PD patients.

- The "Transition from PD" project aims to support a planned patient transition to haemodialysis or conservative care from peritoneal dialysis. A structured risk assessment and management pathway for all PD patients is currently being developed to identify potential PD failure early and initiate timely implementation of processes i.e. vascular access creation or renal supportive care referral and patient education/support.

Clinical and QA activities

- Continue the effective initiatives and projects i.e. bi-annual patient newsletters, clinic review, 1:1 comprehensive training and retraining program, outpatient follow-up and support, and pre-PD assessment/education.
- Work closely with the following allied health team:
    - Social Worker – to reinstate annual allied health talks and annual "people on PD" support group meeting
    - Dietitian – regular meetings and referrals to develop strategies to improve patient nutrition
    - Podiatrist – promote outpatient podiatry screening service to high risk PD patients
- Progress the processes in place i.e. clinic review checklist project roll-out and nurse-facilitated iron management
- Biannual patient satisfaction surveys.
- The annual review of PD policies to continue, in the aim to keep in line with ISPD best practice guidelines.

6. TRANSPLANT REPORT

Tania Burns and Kylie Turner

Aims

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 provides data about patients who are currently on the National Organ Matching Service (NOMS) transplant waiting list, renal donors and the transplant assessment clinic. Performance measures in the first 12 months post-transplant:

- Patient and graft survival above national averages (ANZDATA)
- 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%
- Rates of biopsy proven acute rejection <15%
- Rates of post-transplant surgical complications < 5% (urological, vascular and wound)

Overview

During 2014 there were 186 patients under the care of SGH nephrologists with functioning renal transplants.

- 176 of these were primary grafts and 10 were second grafts
- 47 of these patient received grafts from live donors
- 11 were pre-emptive transplants

At 31/12/14 there were 50 SGH dialysis patients waiting for a kidney transplant and 4 patients with CKD not yet on dialysis who have completed work up and been assessed as suitable for transplant.

During 2014

- 13 patients received a kidney transplant and 2 received a combined kidney pancreas.
- 3 patients died with functioning grafts.
- 1 patient had graft failure and returned to dialysis.
- 5 patients transferred out, and 2 transferred in
- A total of 78 patients were reviewed at the transplant assessment clinic by a nephrologist from Prince of Wales hospital, the transplanting unit.

Transplant patient flow

	1/1/14 SGH transplant patients registered with ANZDATA	**170**
Out	Transferred care out	5
	Died	3
	Graft failure transferred back to dialysis	1
	Subtotal out	**9**
In	Transplanted	15
	Transferred care in	2
	Subtotal in	**17**
	Net gain	**+8**
	31/12/14 SGH transplant patients	**178**

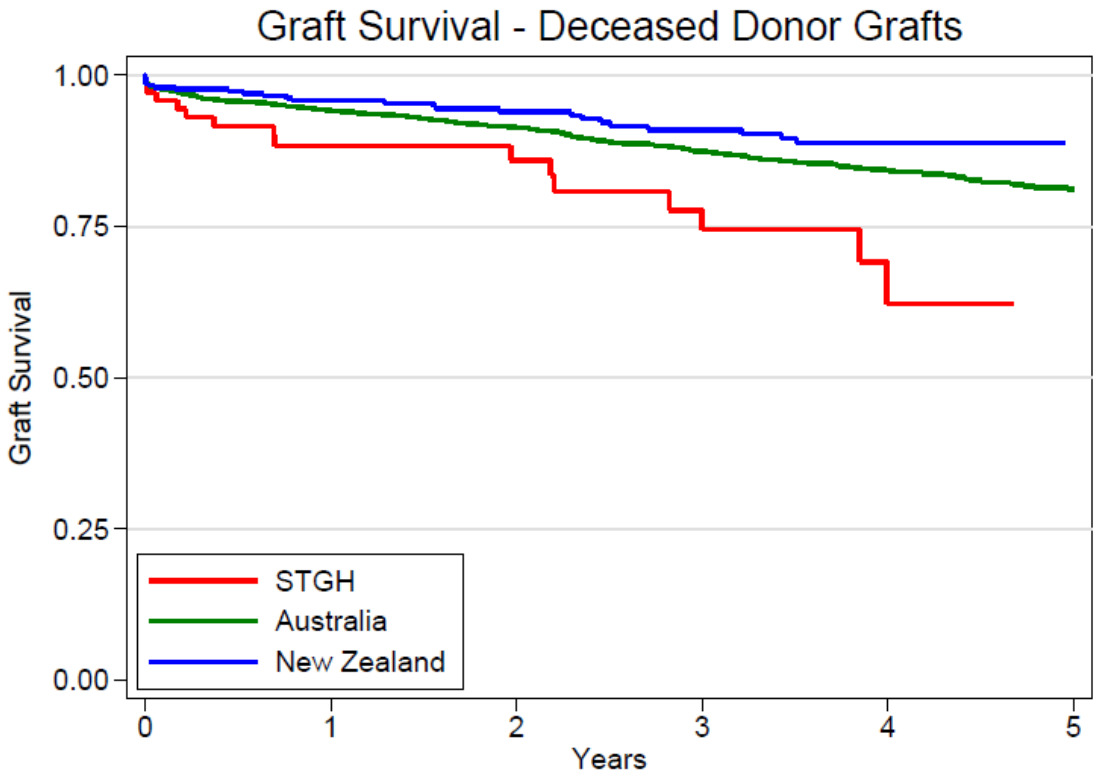
Benchmarks to 12 months post-transplant:

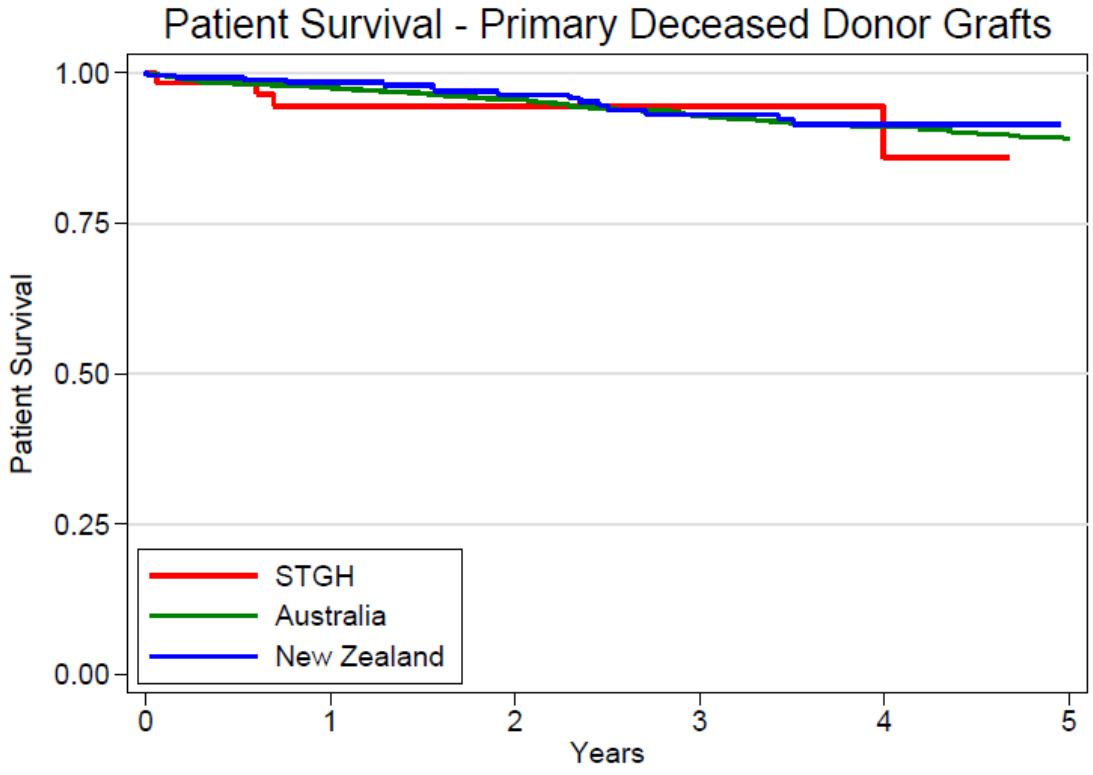
Graft survival for deceased donor transplants (ANZDATA 2008-13) are not at the level we aim for, partly due to early graft loss then again due to later graft loss after about 2 years. Patient survival is similar to the rest of Australia.

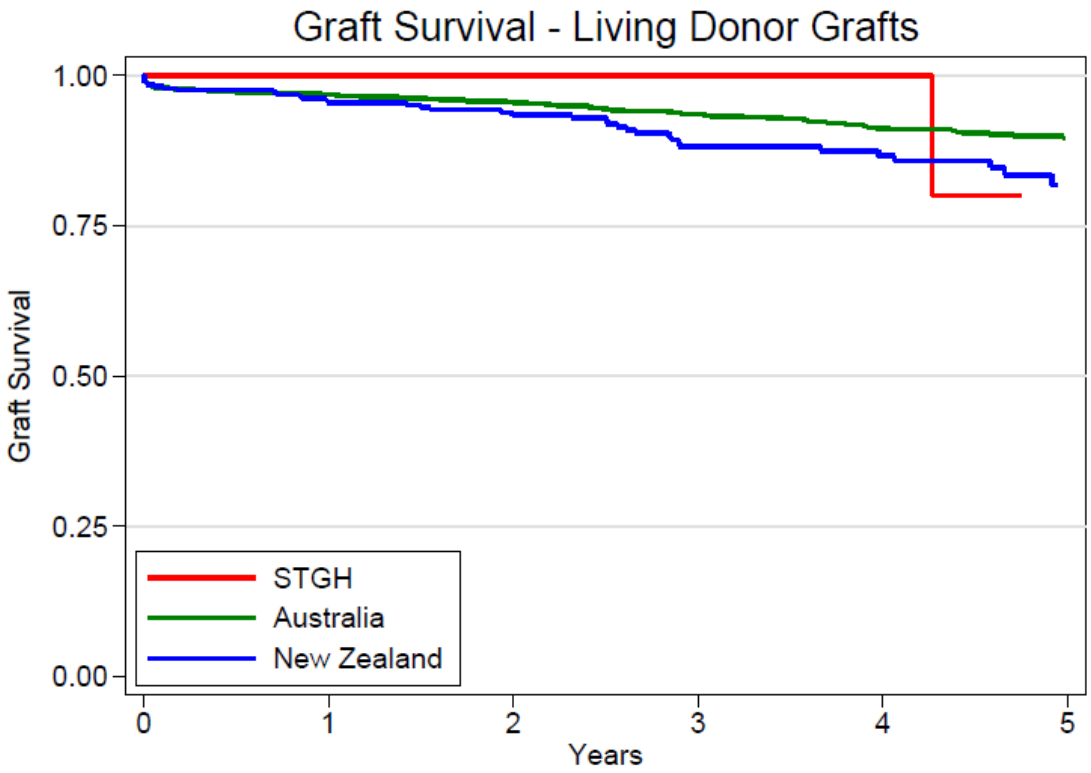
For deceased donor recipients there were no differences in age, gender or primary cause of renal disease. More had been waiting longer than 2 years for a transplant (90 vs 75%), slightly more had IHD (28 vs 22%), and more had Type 2 diabetes (25 vs 16%). Fewer had peak PRA below 20% *64 vs 81%). Donor age was similar.

By 12 months fewer had creatinine <120 (38 vs 44%) and there were more deaths/graft loss (14 vs 6%). Graft survival is shown below.

	STGH		Australia	
Time	n	% Survival (95% CI)	n	% Survival (95% CI)
0	72	100.0	2861	100.0
3 months	67	93.1 (84.1-97.0)	2636	96.7 (96.0-97.3)
6 months	62	91.6 (82.3-96.1)	2500	95.7 (94.9-96.4)
1 year	48	88.4 (78.0-94.0)	2168	94.2 (93.3-95.1)
2 years	35	86.0 (74.4-92.6)	1610	91.5 (90.3-92.5)
3 years	23	74.5 (58.7-85.0)	1101	87.5 (85.9-88.8)
4 years	9	62.2 (40.4-78.0)	659	84.3 (82.4-86.0)
5 years	3	62.2 (40.4-78.0)	321	81.2 (78.9-83.3)

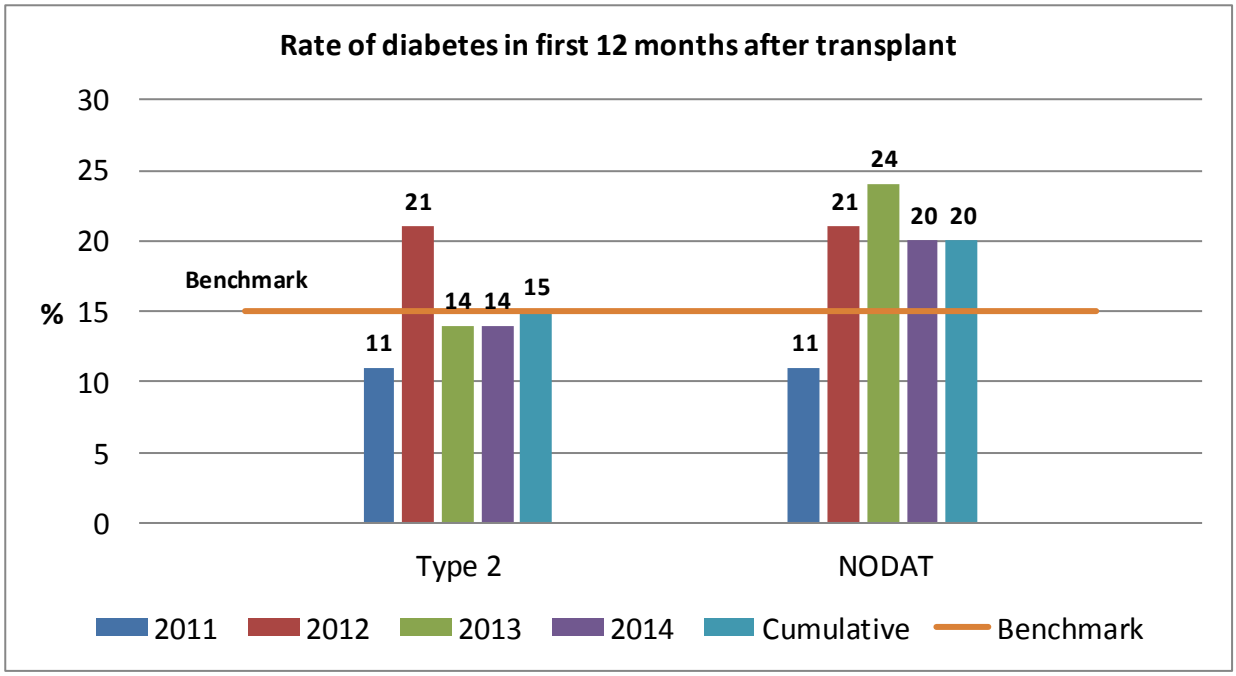

Graft Survival - Deceased Donor Grafts
1.00
0.75
0.50
0.25
0.00
Graft Survival
STGH
Australia
New Zealand
0
1
2
3
4
5
Years

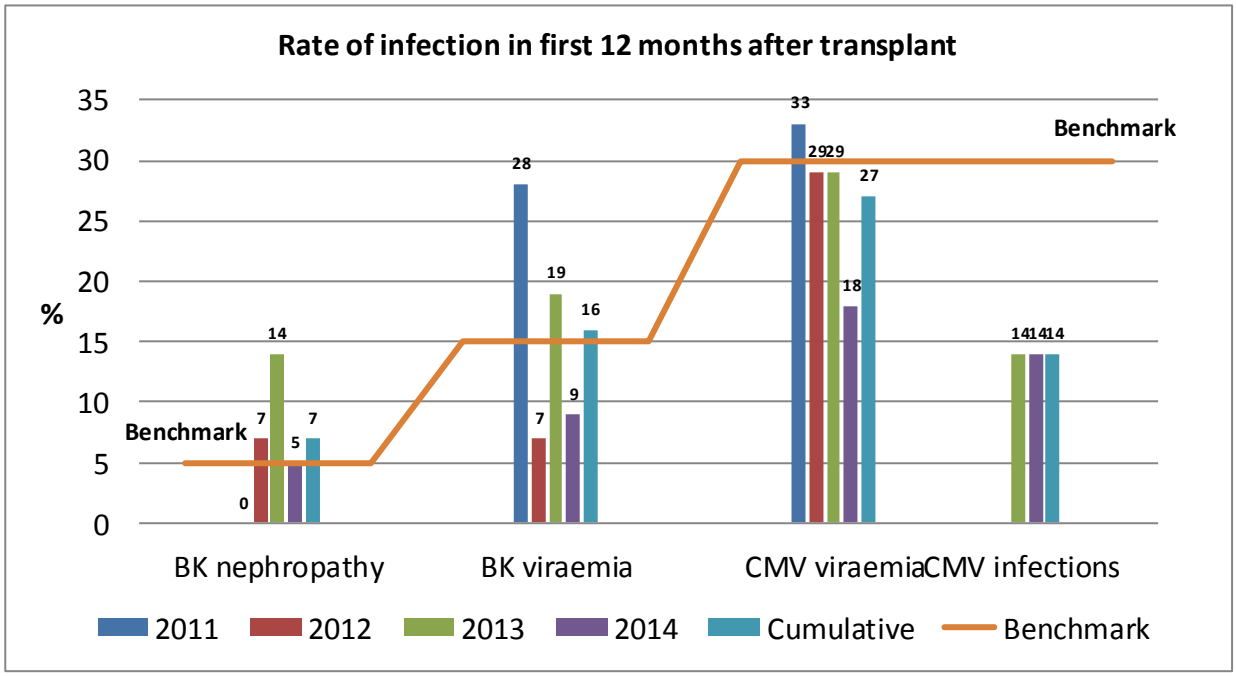

Patient Survival - Primary Deceased Donor Grafts
1.00
0.75
0.50
0.25
0.00
Patient Survival
STGH
Australia
New Zealand
0
1
2
3
4
5
Years

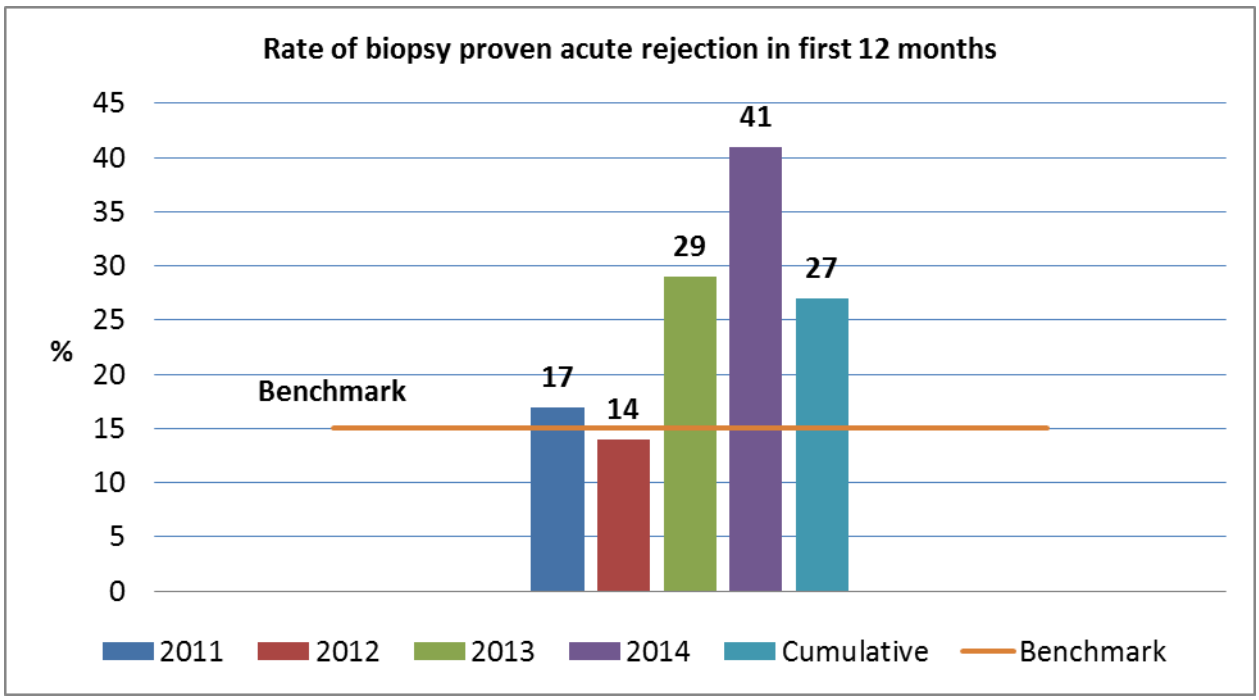


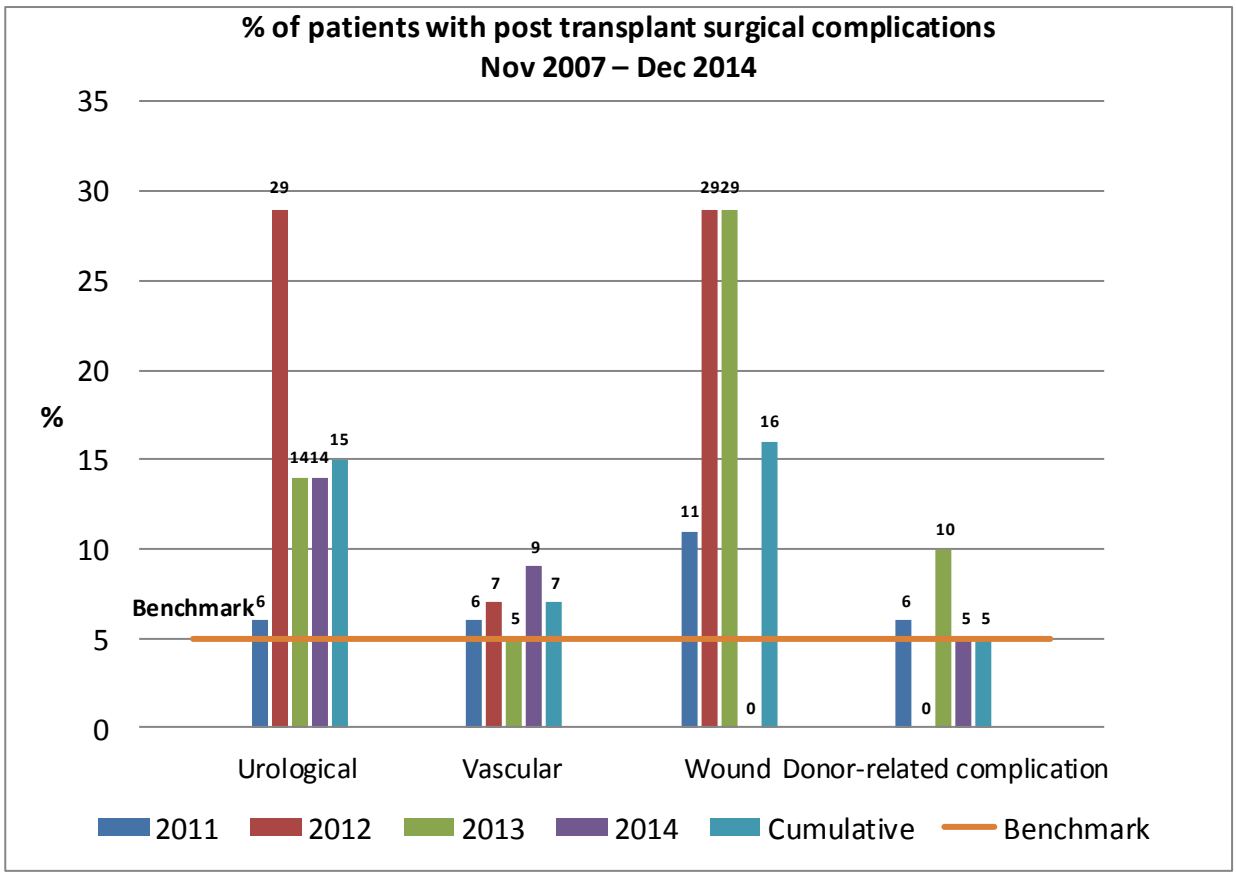
Causes of graft failure are shown below:

	STGH	Australia
Total Failures	16	440
Acute Rejection	2 (12.5)	58 (13.2)
CAN		74 (16.8)
Vascular/Technical	4 (25.0)	53 (12.0)
Recurrent Disease	2 (12.5)	11 (2.5)
Other	2 (12.5)	52 (11.8)
Death with Function	6 (37.5)	192 (43.6)


Rate of diabetes in first 12 months after transplant
30
25
20
%
15
10
5
0
Benchmark
11
21
14
14
15
11
21
24
20
20
Type 2
NODAT
2011
2012
2013
2014
Cumulative
Benchmark


Rate of infection in first 12 months after transplant
35
30
25
20
%
15
10
5
0
Benchmark
0
7
14
5
7
28
7
19
9
16
33
29
29
18
27
14
14
14
Benchmark
BK nephropathy
BK viraemia
CMV viraemia
CMV infections
2011
2012
2013
2014
Cumulative
Benchmark


Rate of biopsy proven acute rejection in first 12 months
45
40
35
30
25
20
15
10
5
0
%
Benchmark
17
14
29
41
27
2011
2012
2013
2014
Cumulative
Benchmark


% of patients with post transplant surgical complications
Nov 2007 – Dec 2014
35
30
25
20
15
10
5
0
%
Benchmark
6
29
14
14
15
6
7
5
9
7
11
29
29
0
16
6
0
10
5
5
Urological
Vascular
Wound
Donor-related complication
2011
2012
2013
2014
Cumulative
Benchmark

Waiting list data

Age group	ANZDATA % age group on wait list (benchmark)	Wait list Oct 2014	Dialysis Oct 2014	SGH % age group on wait list Oct 2014	Wait list Oct 2013	Dialysis Oct 2013	SGH % age group on wait list Oct 2013	Wait list May 2013	Dialysis May 2013	SGH % age group on wait list May 2013
20-29	**31%**	2	5	**40%**	2	5	**40%**	3	5	**60%**
30-39	**26%**	9	11	**82%**	6	11	**55%**	6	11	**55%**
40-49	**21%**	12	19	**63%**	13	22	**59%**	13	22	**59%**
50-59	**17%**	15	40	**38%**	13	35	**33%**	18	36	**50%**
60-69	**12%**	17	63	**27%**	13	55	**24%**	18	53	**34%**
70-79	**1%**	1	74	**1%**	0	68	**0%**	1	67	**1%**
80+	**<1%**	0	57	**0%**	0	51	**0%**	0	47	**0%**

Summary

Overall patient survival and graft survival for live donor transplants are as good as the national average. In addition we have a higher rate of our dialysis patients awaiting transplant across all age groups.

An area of concern is graft loss of deceased donor transplants. There appears to be two components: an early post transplant loss and a later loss after about 2 years. ANZDATA reports that the main reason for graft loss is technical or vascular – this is part of ongoing discussions with surgeons and each case of graft loss is now reviewed.

In 2014 rates of NODAT were stable at 20%, although higher than the benchmark of 15%.

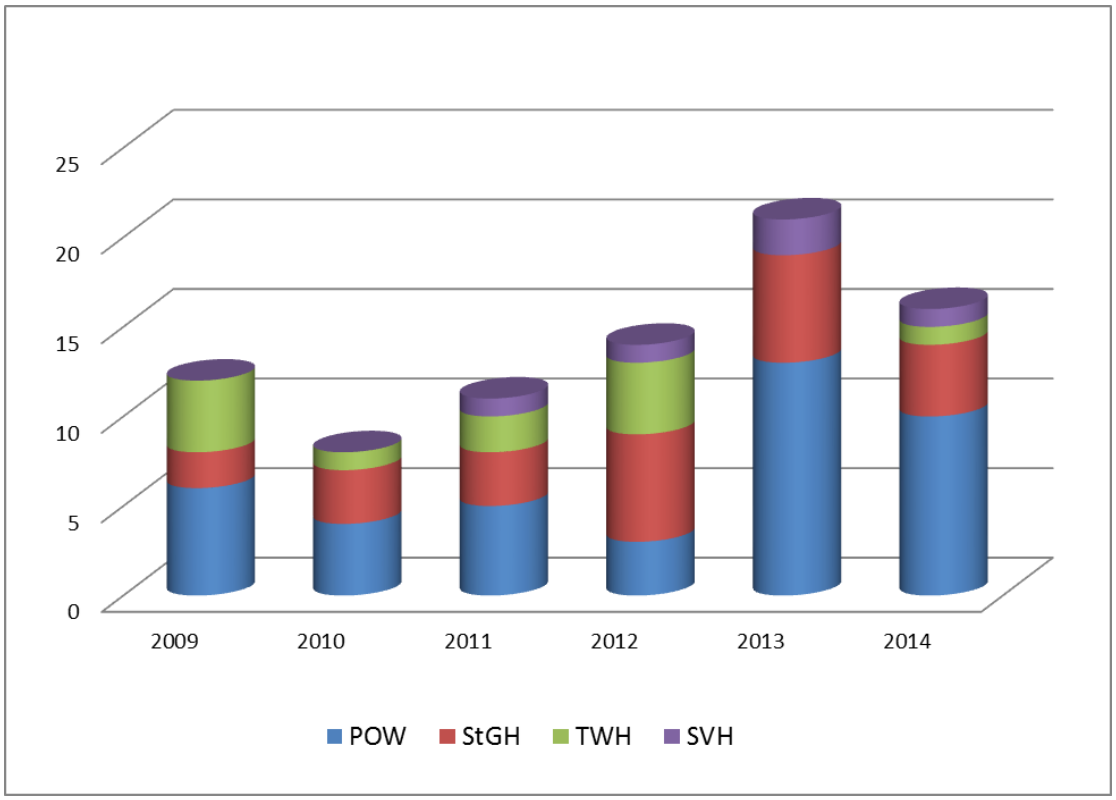
Rates of BK nephropathy, BK viraemia, CMV viraemia and CMV infection were all lower than the set benchmarks, but the rate of biopsy proven acute rejection was 41% compared to a target of 15%. To address this finding each case of biopsy proven acute rejection will now be reviewed to assess whether these patients received adequate immunosuppression.

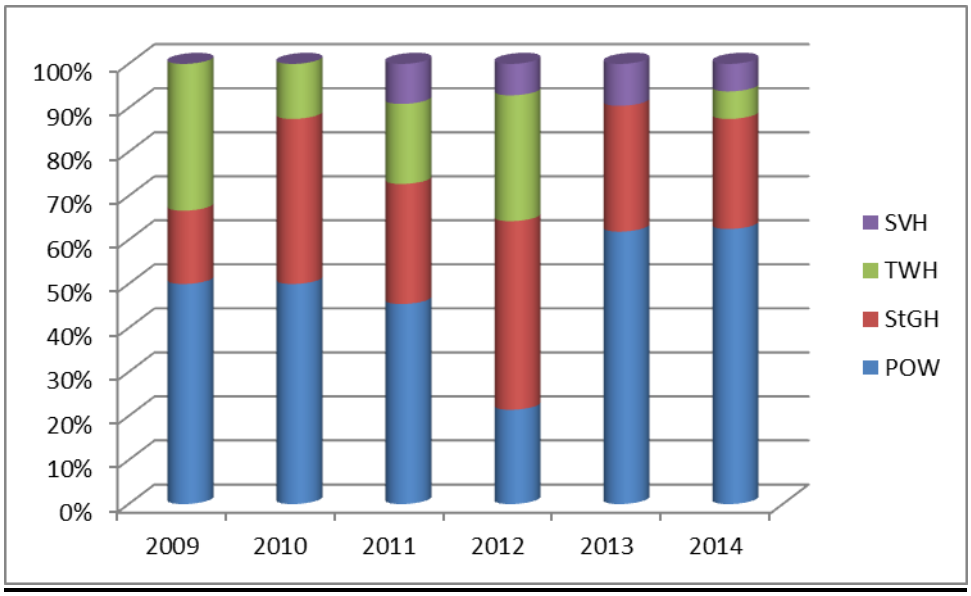
Wound complications of surgery were at or below the 5% benchmark, while urological surgical complications were well above benchmark at 14%.

Our focus will now be on improving early surgical/technical outcomes and reducing graft loss after about two years; the latter will be assisted by establishing a new clinic for 'difficult' transplant patients to have an independent review.

RENAL DONOR CLINIC REPORT 2014

Number of patients progressing as live donors by hospital in ECRS 2009-2014



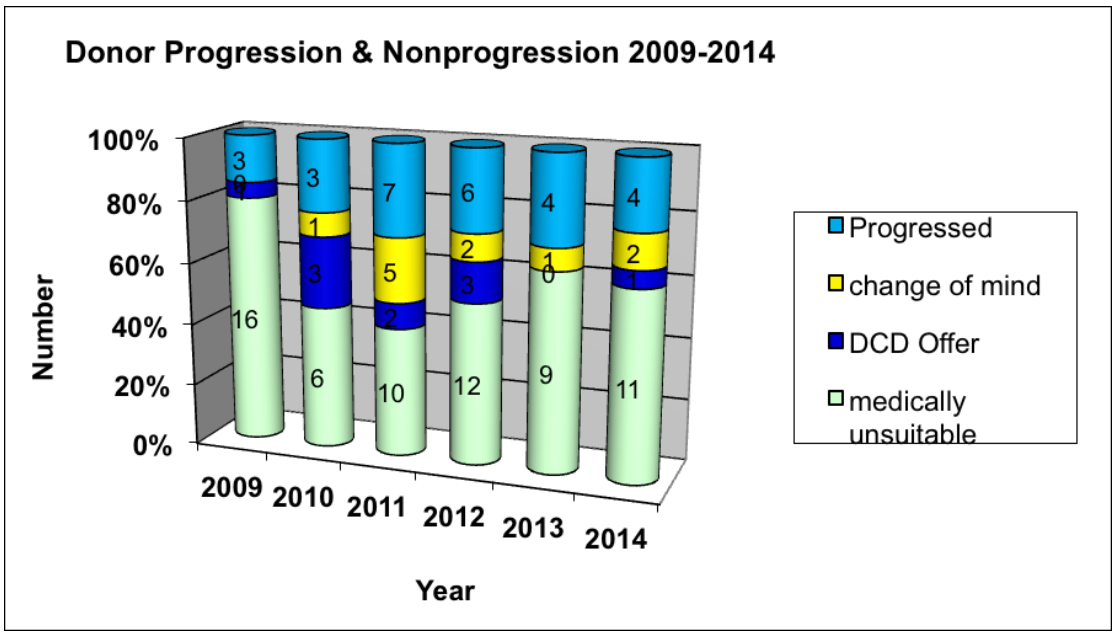


** Sydney Children donors appear as POW figures as do patients who live elsewhere e.g. rurally - automatically have their final reviews at POW and appear within POW figures.

Donor Progression and Non-Progression

Assessed 2009 - 2014

- 2009-2014: 24 patients have medically progressed as renal donors and 23 have undergone donation (lag time between progression and donation)
- 64 patients have been found to be medically unsuitable to progress as renal donors.
- 11 donors had a change of mind.
- In addition; 10 donor assessments were suspended when recipient received deceased donor transplant



Donor Non-Progression

Rates of non-progression vary from year to year and range from 46 to 80%. Due to small overall numbers the percentages change dramatically.

In 2014, donor non-progression rate due to medical unsuitability was at 61% (11/18). Overall the non-progression rate due to medical unsuitability is 59% (2009-2014)

The reasons for non-progression are often multifactorial with cumulative risk having greater import than any individual risk factor. For example, donors may have hypertension and although only requiring a single agent to achieve control when added risks of obesity, dyslipidaemia, age and family history they are precluded as proceeding as renal donors. Listing an individual reason for non-progression in a database becomes difficult to interpret.

A flavour for the reasons for medical non-progression is tabulated below:

Progressive Reasons for Donor Non-Progression

	2009	2010	2011	2012	2013	2014
Renal Disease / Low GFR / asymmetric renal function	2	2	2	7	-	1
Immunological	3		-	-	-	1
Recipient issue	1	1	-	-	-	-
Diabetes/IGT	2	1	2	2	-	1
Change of Mind	2	2	2	2	1	3
Paraprotein/ Malignancy	1	-	1	-		1
HT/CVS	1		-	5	2	2
Social	1	-	-	-	-	-
Stone Disease	1	1	-	-	-	-
Other	-	-	-	3	5	5
Lost to F/Up	1	-	1	-	-	-

ABO incompatible/ X-match positive

In 2014 there were no Xmatch positive donor/recipient pairs. There was one ABOi incompatible transplant where the recipient required desensitisation and there were no transplants through the Australian Paired Kidney Exchange Program (one pair remain registered.)

Complex Donors

Unlike previous years there were only 2 of the 4 donors with complex medical issues.

Long-Term Donor Follow-Up

- Thirty four live donors are followed-up in the donor clinic. Donor data from 2009 has been captured. From 1999 to 2009 the donor database is incomplete but accurate for those identified.
- Five live donors have been lost to follow-up and cannot be contacted.
- Five live donors have had formal care transferred to another nephrologist/GP (one to a GP as living remotely and unable to attend clinic)
- Donor Database as at 2014

Public Follow-Up	34
Private Follow-Up	14
Officially Transferred Care	5
Lost to follow-Up	5

- A further 14 live donors are followed up in the private sector. These patients are difficult to access data for ANZDATA follow-up. It is worth noting that this number is static and there have been no increases in this category for several years
- 91% of the St George Hospital Donors have completed their 2014 annual assessment. These statistics have been forwarded to ANZDATA by the live donor coordinator, Ms Michelle Glasel.
- Of the Donors Followed in The Public Clinic (2009-2014)
    - Age range : 24-77 years of age
    - Average age at donation 47 years
    - 34% of donors are male
    - Relationship to Recipient – 26% mother; 26% spouse (unrelated), 9% father; and the remaining 39% are represented by siblings, children cousins, aunts and other unrelated
    - The data on return to work is incomplete but averages from 2-7 weeks before returning to work at the pre-donation capacity.
    - No donors in public follow-up have evidence of proteinuria

Time post donation	% fall in GFR (CKD-epi) Post Donation (avg)	% of pts with eGFR </= 60ml/min	New onset Hypertension	number
3 months	36	59 (n=16)	0	27
1 year	38	56 (n=15)	2	27
2 years	32	56 (n=10)	2	18
3 years	35	46 (n=6)	0	13
4 years	33	38 (n=3)	1	8
5 years	26	14 (n=1)	1	7

- Eight surgical/medical complications have occurred in the hospital admission at the time of nephrectomy. Pleural effusions (chest drain x1), wound infection, splenic tear, atrial fibrillation, colonic perforation and sepsis, chylothorax
- 3 post operative hernias had been repaired by 12 months post nephrectomy
- Four patients had controlled hypertension prior to undergoing nephrectomy. The cumulative total to date are five **new cases** of hypertension based on office readings of >140/90. These have been confirmed with 24hr ABPM.

7. Renal Supportive Care Service

Aim

The aim of this report is to provide data concerning the activity and outcomes of the Renal Supportive Care (RSC) service.

Overview

The renal department has been working closely since 2009 with Dr Frank Brennan and Dr Jan Maree Davis from the Palliative Care Service to integrate a palliative care chronic disease model of care to benefit our end stage renal disease patients. Dr Frank Brennan, Elizabeth Josland, Hannah Burgess, Maria Chan, Anna Hoffman who replaces Gemma Collett, Shelley Tranter, Prof Mark Brown and Dr Jan Maree Davis, comprise the renal palliative care groups and they meet monthly to discuss and implement renal supportive care initiatives.

1. The **Renal Supportive Care Clinic** commenced in March 2009; A new weekly clinic at Sutherland Hospital commenced in January 2014 in addition to the weekly St George clinic. The St George RSC clinic is staffed by Dr Frank Brennan, a renal advanced trainee registrar, renal supportive care clinical nurse consultant and a research clinical manager. The clinic also receives support from the renal social worker and dietician.

2. The fifth **Renal Supportive Care Symposium** was held on 1st August 2014. Doctors, nurses and allied health attended. There were over 190 attendees in 2010, 150 in 2011, 100 in 2012, 120 in 2013 and 100 in 2014 from around Australia and New Zealand.

3. The renal department website has a dedicated palliative care section which includes details of current research, guidelines, patient information, education and presentations.

4. The fourth annual **Renal Memorial Service** was held in April 2014 and was attended by 30 people, consistent with previous year's attendance. This service aims to provide families and friends of past renal replacement therapy (RRT) patients with a supportive environment to commemorate their loved ones and is a unique service in NSW that is coordinated by Hannah Burgess the renal social worker.

Occasions of Service and Outcomes

Table 1: Occasions of Service

	St George Clinic Occasions of Service	Sutherland Clinic Occasions of Service	Inpatient Occasions of Service	Home Visits	Phone consultations
March 09 – Dec 09	110		Data not collected	0	0
2010	218		30 (data collection commenced Nov 2010)	0	0
2011	403		351	0	15
2012	498		322	2	64
2013	378		511	14	69
2014	300	109	415	54	131

2014 clinic numbers are now divided into St George and Sutherland hospitals; the numbers remain steady with a total of 409 occasions of service. Table 1 indicates occasions of service for both inpatients and outpatients in 2014.

Since the commencement of the clinic in 2009, the age of newly referred patients has ranged from 25-99 years with the overall mean age 78 years, diabetes 50%, albumin 33g/L and other demographics as reported in table 2. **Advance care plans are becoming standard practice within the clinic practice now which includes yearly reviews**.

Table 2: Patient demographics on first clinic visit 2009-2014

		Non-dialysis patients	Dialysis Patients
Age	Average age in years	83	71
eGFR	Average	17	
Diabetic		51%	49%
Dementia		10%	3%
2 or more co-morbidities		46%	20%
Current or former smokers		27%	37%

There are 3 main categories of patients who use the services of the renal supportive care clinic:

1. Conservative care support
2. Dialysis (or pre dialysis) symptom support
3. Support for those who may be withdrawing from dialysis following a major sentinel event or by other choice.

Inpatient consultation

The service has an average of 34 inpatients occasions of service per month with an average of 5 new inpatient referrals per month in 2014.

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

Outpatient services

Telephone consultations commenced in 2012 to assist patients who are too frail to physically attend the clinic. There were 131 phone consultations in 2014 mainly by the CNC.

Home visits by the renal supportive care CNC commenced December, 2012. The CNC attended 54 home visits in 2014, an increase from 14 in 2013. A number of patients were referred to the Calvary Hospital Community Palliative Care Team (CPCT), or their local community palliative care team if they lived out of area, for complex symptom management or they were approaching end of life.

Advance Care Plans

Advance Care Planning commenced in the Renal Supportive Care clinic in August 2012. As of December 2014, there were 57 current RSC clinic patients (52 of whom were competent) who were not for dialysis (NFD); 23/52 (44%) competent patients had an Advance Care Plan (ACP) completed, a further 7 patients have commenced an ACP discussion. These ACP's are sent to the patient's GP and loaded into eMR alerts. ACP's are updated yearly; this update is recorded in eMR. 14 current dialysis patients as at Dec 31st 2014 have an advance care plan.

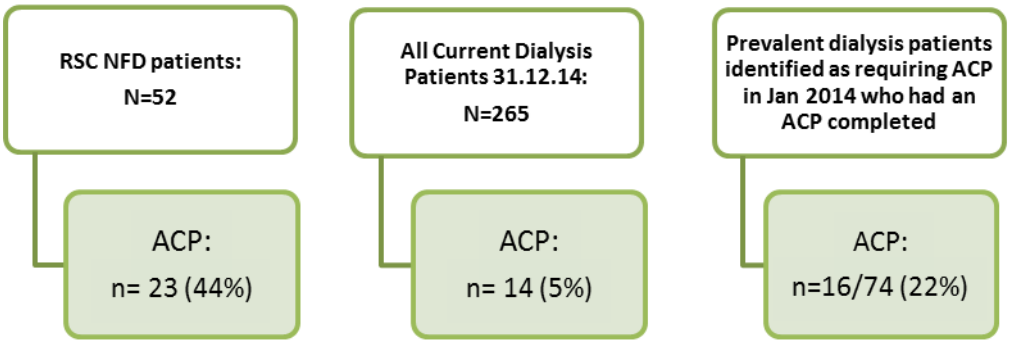


Figure 1: ACP's completed for current NFD and dialysis patients

Palliative Care Outcome Scale Clinic outcome

60% of patients had a reduction in total symptom scores within 3 clinic visits (table 3).

Table 3: Change in POSs (renal) score over 3 clinics

Symptom burden Change from 1st to 3rd visit	n	%
Increased	56	34%
No Change	9	6%
Reduced	98	60%
Grand Total	163	100%

Palliative Care Outcome Scale – Symptoms -Renal [POS-S (renal)] Snapshot

A snapshot survey of all renal replacement therapy (RRT) patients is now performed every 6 months and after an initial pilot in April 2014 it was repeated in late 2014. It is a quality initiative to identify the symptom burden in RRT patients. Results in table 4 show a number of symptoms that cause severe to overwhelming distress to some patients, especially weakness or lack of energy, difficulty sleeping and pain indicating management is required. The current total return rate for the October-December 2014 collection is 68%, data collection and analysis is ongoing.

Table 4: POS-S renal scores April and November 2014

	Hosp HD %		PD %		Home HD %		Transplant %	
	Apr 2014 *n=90*	Nov 2014 *n=133*	Apr 2014 *n=49*	Nov 2014 *n=44*	Apr 2014 *n=24*	Nov 2014 *n=19*	Apr 2014 *n=74*	Nov 2014 *n=99*
Pain	8.9	11.3	4.1	4.5	8.3	10.5	8.1	4.0
Shortness of Breath	4.4	9.0	8.2	4.5	4.2	0.0	5.4	3.0
Weakness or lack of energy	14.4	10.5	14.3	15.9	16.7	10.5	12.2	9.1
Nausea	1.1	3.0	2.0	0.0	0.0	0.0	4.1	2.0
Vomiting	0.0	0.0	2.0	0.0	0.0	0.0	1.4	0.0
Poor Appetite	4.4	3.0	4.1	6.8	0.0	0.0	1.4	1.0
Constipation	8.9	7.5	6.1	6.8	8.3	5.3	2.7	2.0
Mouth Problems	4.4	2.3	8.2	2.3	4.2	5.3	4.1	0.0
Drowsiness	11.1	8.3	14.3	2.3	4.2	0.0	5.4	5.1
Poor Mobility	17.8	12.8	10.2	11.4	8.3	5.3	5.4	5.1
Itching	7.8	5.3	10.2	4.5	4.2	5.3	1.4	0.0
Difficulty Sleeping	16.7	12.0	6.1	15.9	12.5	15.8	13.5	10.1

	Hosp HD %		PD %		Home HD %		Transplant %	
Restless Legs	8.9	5.3	4.1	6.8	8.3	15.8	4.1	3.0
Feeling anxious	4.4	5.3	2.0	4.5	12.5	5.3	5.4	2.0
Feeling depressed	5.6	5.3	2.0	2.3	8.3	5.3	6.8	5.1
Changes in Skin	5.6	6.8	4.1	4.5	0.0	5.3	6.8	6.1
Diarrhoea	0.0	1.5	0.0	2.3	0.0	0.0	5.4	1.0

Karnofsky Performance scale

The Karnofsky performance scale was chosen as a measure of functional status. Definitions of scores are: At 10-40 the person in unable to care for self and requires equivalent of institutional or hospital care. At 50-70 the person is able to live at home and care for their personal needs with varying amount of assistance. At 80-100 the person is able to carry on normal activity and no special care is needed. All renal replacement therapy patients are having a Karnofsky score recorded every 6 months. Major deterioration in scores should flag a person for renal supportive care involvement. Figure 2 demonstrates the range of scores in November 2014 for hospital haemodialysis and peritoneal dialysis.

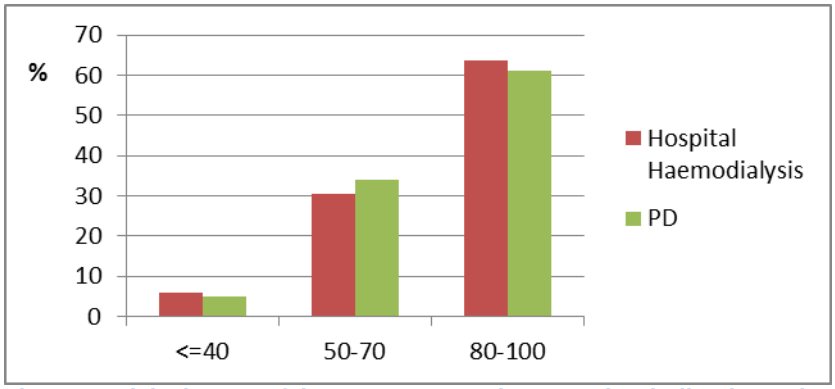


Figure 2: Dialysis Karnofsky scores November 2014 (excluding home haemodialysis and transplant)

Research, Publications, Teaching and Presentations

Research

- **Ex**periences of **Pa**lliative **N**ephrology and Pre-**D**ialysis Clinics (EXPAND). (HREC/10/STG/121). A Retrospective Observational Cohort study, to primarily describe the characteristics and outcomes of patients attending standard renal outpatient clinics and patients attending a palliative nephrology clinic (with combined palliative nephrology input), and a secondary outcome, to describe the longitudinal impact of a palliative nephrology clinic on symptom burden, quality of life and patient satisfaction. This study ran from March 2009 to March 2013. Published in CJASN.
- Efficacy and safety of Gabapentin for uraemic pruritus and restless legs syndrome in conservatively managed patients with end stage kidney disease. H. Cheikh Hassan, Dr F Brennan, Gemma Collett, **Elizabeth Josland**, Prof MA Brown. Published Sept 2014
- **H**elping **O**lder **P**atients with **E**nd-stage kidney disease (HOPE): survival, symptom control and quality of life without dialysis. Brown MA, Collett G, Josland E, Foote C, Brennan F.
- Does dialysis make a difference to symptom burden? Tan T, Collett G, Tranter S, Brown MA and Brennan F.
- The symptoms of patients with CKD Stage 5 being managed conservatively – a survey of symptom prevalence and severity. Frank Brennan, Gemma Collett, Elizabeth Josland, Mark Brown.

Publications

- **Brown M, Collett G, Josland E**, Foote C, Li Q & **Brennan F**. CKD in Elderly Patients Managed without Dialysis: Survival, Symptoms and Quality of Life, CJASN Feb 20153
- Foote, C, Morton R, Jardine M, Gallagher M, **Brown M**, Howard K & Cass A. Considerations of Nephrologists when Suggesting Dialysis in Elderly patients with Renal failure (CONSIDER): a discrete choice experiment. (2014) Nephrol Dial Transplant 29: 2302-2309.
- Luckett T, Sellars M, Tieman J, Pollock C, Silvester W, Butow P, Detering K, M. **Brennan F** & Clayton, J. (2014) Advance care planning for adults with CKD: a systematic integrative review. American Journal of Kidney Diseases.63(5):761-70
- Davison SN, Konicki H, **Brennan FP**. Pain in Chronic Kidney Disease: A Scoping Review. *Seminars in Dialysis* 2014; 27(2): 188-204.
- **Hassan CHI, Brennan FP, Collett G, Josland EA, Brown MA**. Efficacy and safety of Gabapentin for Uremic Pruritus and restless Legs Syndrome in Conservatively Managed Patients with Chronic Kidney Disease. *J Pain Sympt Manage* 2014 Sept 8 [Epub ahead of print]

Presentations and Teaching

- Dr Frank Brennan gave 36 presentations over 2014, which included national and international conferences, lectures, panel discussions, lectures via Skype and teaching sessions.
- Dr Brennan provided a bi-monthly outreach RSC service rotating around Tamworth, Moree and Armidale, NSW.
- Dr Brennan gave a series of six half-hour tutorials on all aspects of Renal Supportive Care to the junior doctors in the Renal Department. This series of tutorials was repeated during the year to each new group of doctors. In addition, Dr Brennan gave a one hour tutorial summarising Renal Supportive Care four times during the year to each new group of junior doctors at Calvary Hospital, Kogarah.
- Elizabeth Josland participated in 7 presentations (conferences, panel discussions and talks), and provided in-service education on multiple occasions throughout the year.
- The 5th Renal Supportive Care Symposium took place on August 1st, 2014.
- Hannah Burgess presented to the Palliative Care Social Workers of NSW Special Interest Group, and, to the Palliative Care Social Work Symposium, on RSC and the potential scope for the social worker role in a supportive care service. Also her abstract regarding RSC social work has also been accepted for a presentation at World Social Work Day in 2015.
- Prof Brown gave 3 presentations on this topic.

Achievements for 2014

- There have been a number of visiting doctors, nurses and allied health visiting the clinic throughout 2014 including a Program of Excellence in the Palliative Approach (PEPA) placement, a visiting nephrologist training in palliative care from New York and a social worker from Spain.
- The St George Hospital RSC service has a major role within a Renal Palliative Care Working Group which was developed by the NSW Agency for Clinical Innovation (ACI). The ACI Renal Palliative Care Working Group was established to provide the ACI Renal and Palliative Care Networks with expert advice on development and implementation of a state-wide Renal Supportive Care model for patients with ESKD, with the first meeting held in March 2013. St George has 3 members on this group. A position paper has been published: "Development and implementation of a State-wide Renal Supportive Care Service" A draft implementation plan for a state-wide renal supportive care service is being developed for implementation in early 2015. $3 million was announced in the 2014 state budget to progress this state-wide program.
- Dr Brennan has spoken at many conferences including overseas in India, Sri Lanka, Malaysia and Canada.

Performance indicators and outcomes for 2014

1. **Symptom control**: A reduction in total symptom scores within 3 clinic visits.
   1.1. **Outcome**: 60% of RSC clinic patients had a reduction in symptom scores within 3 clinic visits. The RSC service continues to pursue reduction in symptom burden for each patient.

2. **Advance Care Plans**: 100% of competent and consenting ESKD patients who are not for dialysis and are seen in the renal supportive care clinic, or for those who are currently on dialysis but their treating physician has identified that they would "not be surprised if they died in the next 6 -12 months", or have a predicted <50% 12 month survival, have an advance care plan competed and reviewed every year.
   2.1. **Outcome**: 44% of NFD who are seen in the RSC clinic have an ACP, but ACPs are not appropriate for 16% of the group and have been discussed with a further 18% who are currently either waiting or not keen to proceed. Total of 78% of patients have discussed or completed, or have another form of privately completed legal document, or been deemed unsuitable for, an ACP. 22% of dialysis patients identified as requiring an ACP in 2014 (n=16/74) had one completed (another 5% had one discussed). All nephrologists will be sent a list of their current patients again in 2015 to identify those requiring an ACP or a review current ACPs.

3. **Symptom and functional state assessment**: 100% of patients have a POS-S (renal) symptom survey and Karnofsky performance scale measured in the RSC clinic on each visit.

3.1. **Outcome**: This is achieved and is used in each clinic visit to identify individual issues and monitor change.

4. **Symptom assessment in dialysis**: All dialysis patients have a POS-S (renal) symptom survey and Karnofsky performance scale measured every 6 months.
   4.1. **Outcome**: In November 82% or surveys were returned from dialysis patients (excludes transplant). 98% of Karnofsky scores were captured (excludes transplant and home haemodialysis). These clinical tools will be used twice a year for each patient to monitor progress and identify issues.

5. **Research and publications – evidence of ongoing research and presentations**.
   5.1. **Outcome**: Listed on previous pages.

Summary

The RSC service offers holistic service to end stage renal failure patients and their families to reduce symptom burden, improve quality of life and provide support towards end of life care where required. RSC works in collaboration with the palliative care service. Measurements of symptom burden, quality of life and patient satisfaction are collected routinely with ethics approval to monitor clinic outcomes over time. The RSC service is being well utilized by the renal patients and has a growing role in inpatient management and home visits evident by the growth occasions of service. RSC is growing in Australasia and there is a growing demand for education on the topic noted by the growing requests to visit the clinic or provide outside education.

Quality of Life Report 2014

Background

Research has shown that the quality of life (QOL) experienced by the dialysis population to be well below the QOL experienced by the general Australian population. Eight audits conducted by our unit in 2001, 2003, 2004, 2006, 2008, 2010, 2012 and 2014 also show similar results.

Aim

The aim of this investigation is to determine the QOL of Renal Replacement Therapy (RRT) patients and to determine if there is a relationship between QOL, specific biochemical markers (albumin and haemoglobin), dialysis adequacy (Kt/V, a measure of urea clearance), age, and diabetic status.

Method

- Home haemodialysis, peritoneal dialysis (PD) and transplant patients were sent a SF 36 questionnaire via the mail with a reply paid envelope attached. Hospital and satellite haemodialysis (HD) patients were handed their questionnaires in person.
- Patients excluded from the survey were non-English speaking where there was no translation available, or suffering from dementia or a psychological condition.

- All returned surveys were entered into the QualityMetric Health Outcomes Scoring software and SPSS 22 for statistical analysis.
- Data was also collected on patient's age, sex, diabetic status, haemoglobin, albumin and Kt/V from data already available from routine audits.
- SF-36 scores were compared with dialysis mode, diabetic status, albumin results below 30g/L and haemoglobin <100g/L using the appropriate parametric or non-parametric unrelated two sample statistical tests; correlation and regression analysis was also carried out to determine if there were any significant linear relationships.
- Transplant patients are analysed separately from dialysis patients.

SF 36 Questionnaire

The SF-36 is a 36-item questionnaire that measures the following eight dimensions of health (Ware et al, 2000).

Parameters	*Description*
Physical Functioning (PF)	Limitations in physical activities because of health problems
Role Physical (RP)	Limitations in usual role activities because of physical health problems
Bodily Pain (BP)	Bodily pain
General Health (GH)	General health perception
Vitality (VT)	Vitality (energy level and fatigue)
Social Functioning (SF)	Limitations in social activities due to physical or emotional problems
Role Emotional (RE)	Limitations in usual role activities because of emotional problems
Mental Health (MH)	Mental health (psychological distress and well being)

- The SF-36 is a universal tool for the measurement of health status. Data exists for population groups (including Australian populations samples, the most recent being from South Australia) allowing for age and gender matched comparisons.

Benchmark Data

Data was compared to the results of the previous surveys.
Data was also compared to the South Australian normative data from the 2004 Population research and outcome studies unit in South Australia.

Ethics

Ethics approval was granted by South Eastern Sydney and Illawarra Area Health Service Human Research Ethics Committee - Southern Section (HREC) for the project named 'Quality of life measurement in patients with end stage renal disease' and was incorporated as part of normal quality practice in the unit with HREC approval once the study was closed.

Results

Responders 2014

A total of 410 surveys were distributed with 231 returned. The return rate was 56% which is an improvement on 2012, but remains lower than earlier surveys which had approximately a 61% return rate. There was a significant difference in ages between responders and non responders with people aged <65 year old returning less than expected surveys $x^2 = 49, p < 0.001$. Gender, albumin, haemoglobin or diabetic status showed no statistical difference between the groups.

Table 5: Patient Characteristics of responders (excludes transplant)

	2001	2003	2004	2006	2008	2010	2012	2014
Age	59.9 ± 14	65 ± 13	63 ± 13.6	62.9 ± 13.45	63.5 ± 13.58	68.4 ± 12.9**	66.8 ± 13.4	69.6 ± 14
Male	58%	64%	61%	61.2%	70.5%	68%	61%	62%
Diabetes	26%	24%	32%	26%	31%	30%	47%	42%
Haemoglobin	116 ± 14.2	115 ± 17.2	120.5 ± 15.9	118.7 ± 18.69	117.1 ± 15.00	114.7 ± 14.3	115.2 ± 14.7	115 ± 14.5
Albumin	32 ± 14.2	32 ± 4.5	32.31 ± 4.51	33 ± 4.5	34.2 ± 4.11	34.0 ± 4.0	33.3 ± 5.1	32.5 ± 3.9
Kt/V CAPD	1.79 ± 0.26	2.1 ± 0.4	2.03 ± 0.54	2.1 ± 0.45	2.16 ± 0.66	2.2 ± 0.67	2.2 ± 0.76	2.5 ± 1
Kt/V HD	1.41 ± 0.27	1.66 ± 0.41	1.75 ± 0.43	1.63 ± 0.39	1.51 ± 0.33	1.6 ± 0.27	1.6 ± 0.35	1.6 ± 0.3

The following graph shows the comparison of our findings for dialysis patients excluding transplantation compared to the Australian normative data.

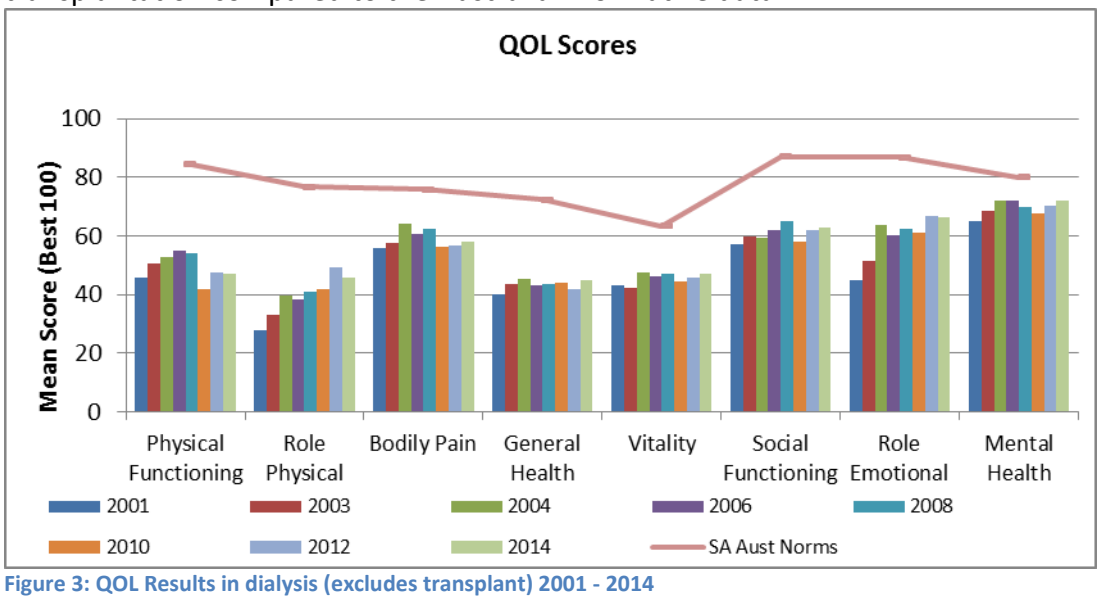


Figure 3: QOL Results in dialysis (excludes transplant) 2001 - 2014

The dialysis patients in the St George renal unit continue to have a poorer self-assessed QOL than the average Australian in all of the eight measured parameters. Since QOL measurement commenced in 2001 there is a significant difference in the scores in physical functioning and role physical. There is a significant difference in age and albumin, and the scores for physical functioning and role physical over the years (excluding transplant). The rate of diabetes in the survey group has increased from 25% in 2003, to 42% in 2012.

Table 6: QOL results by renal replacement therapy (RRT) modality not stratified for age

Parameters	Hospital (n=61)	Satellite (n=38)	Home (n=22)	Peritoneal dialysis (n=34)	Transplant (n=76)	Test Statistic[a]	df	p-value
PF	40.7 ± 33.2	47.1 ± 25.4	65 ± 29.3	47 ± 26.8	72.8 ± 27.5	X^2=44.2	4	<0.001
RP	42.1 ±33	43.9 ± 27.2	54.5 ± 33.6	48.5 ± 31.9	69.6 ± 29.1	X^2=30.3	4	<0.001
BP	50.6 ± 26.4	62.6 ± 30	62.8 ± 36.7	62.5 ± 29.8	69.7 ± 28	X^2=15.4	4	<0.01
GH	46.6 ± 23.8	45.4 ± 21	53.6 ± 21.3	35.9 ± 20.1	52.9 ± 26.2	X^2=14.7	4	<0.01
VT	45.9 ± 25.3	44.9 ± 21.4	55 ± 23.7	46.9 ± 21	55.7 ± 24.6	X^2=10.2	4	<0.05
SF	58.8 ± 29.7	66.7 ± 26.9	71 ± 34.4	59.8 ± 28.6	76.2 ± 28.5	X^2=17.6	4	0.001
RE	58 ± 36.5	71.4 ± 30.7	80 ± 25.8	68.1 ± 34.4	81 ± 23.9	X^2=15	4	<0.01
MH	67.8 ± 22.4	75.1 ± 18.5	75.9 ± 21.2	74 ± 18.5	74.5 ± 20.1	X^2=4.8	4	NS
Age	72.4 ± 12.8	72.9 ± 12.7	62 ± 13.1	66.1 ± 15.5	58.1 ± 12.9	X^2=53.4	4	<0.001
Albumin	33.3 ± 3.7	33.4 ± 2.9	-	30.1 ± 4.1	34.7 ± 5.9	X^2=35.2	3	<0.001
Haemoglobin	118 ± 12.8	116.3 ± 13.2	-	107.7 ± 16.9	128.2 ± 19.7	F=11	3	<0.001
Kt/V[b]	1.7 ± 0.3	1.6 ± 0.2	-	2.5 ± 1	-	F=23.9	3	0.001

Data reported as mean ± standard deviation
[a] X^2=Chi Square, F= ANOVA
[b] Kt/V expected to differ due to differing benchmarks between the modalities (haemodialysis aim is >1.4 while capd is >1.6)

The SF36 scores show a significant difference between the modalities in all parameters (p<0.05) excluding mental health. This is consistent with the 2008, 2010 and 2012 results.

Newly added in 2010 was the transplant population which shows overall better QOL in nearly all parameters in 2014 compared to all dialysis options, except for general health and vitality which score lower than home haemodialysis in general health and hospital haemodialysis in vitality.

Comparing peritoneal dialysis with hospital haemodialysis; peritoneal dialysis shows only slightly better physical results, a better pain score, worse general health (consistent with 2012), similar vitality, similar social functioning and a better emotional score.

Age Groups excluding transplant

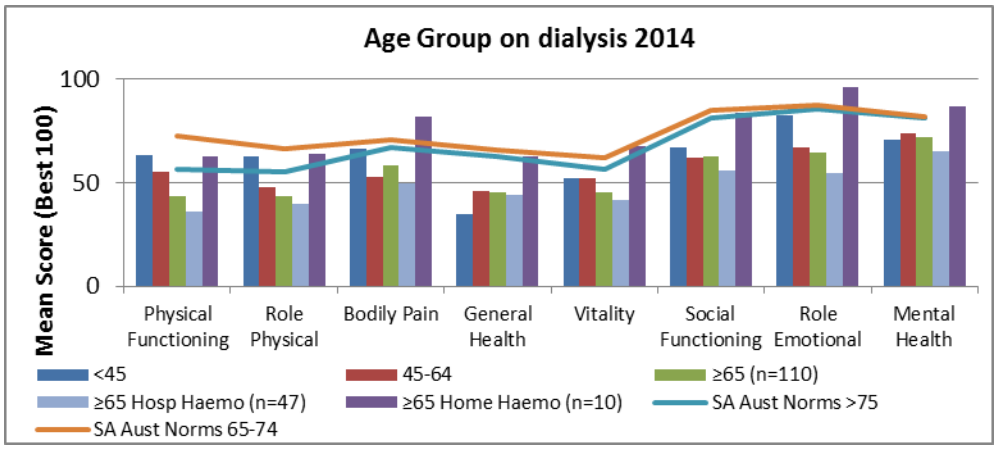


Figure 4: QOL scores for age groups. Patients undergoing dialysis (excludes transplant)

Age groups are compared excluding transplant patients as they are a very different demographic group. Statistical significance between age groups is found using Kruskal-Wallis in Physical Functioning only (x^2=7.2, df=2, p<0.05). Home haemodialysis patients aged ≥65 years (n=10) have a much higher quality of life. This is statistically significant using the Mann-Whitney test in all parameters of the SF 36 (p<0.05) when compared to hospital haemodialysis patients of the same age (n=47), but numbers are very small in this comparison.

Renal Supportive Care Clinic QOL Scores

Renal Supportive Care (RSC) Clinic is available to all conservatively managed ESKD patients as well as RRT patients who are suffering with difficult to control symptoms.

The Renal Supportive Care clinic was established in March 2009 as a result of QOL results to assist four main groups of patients; patients who are managed conservatively without dialysis, patients with dual diagnosis of end stage kidney disease (ESKD) and cancer, ESKD patients with significant symptom burden and patients considering the conservative pathway or dialysis patients who are considering withdrawal of dialysis. The aim of the clinic is to help relieve some of the suffering experienced by ESKD patients who encounter complex and difficult to manage symptoms associated with renal disease or other co-morbid conditions and ultimately impact positively on their QOL.

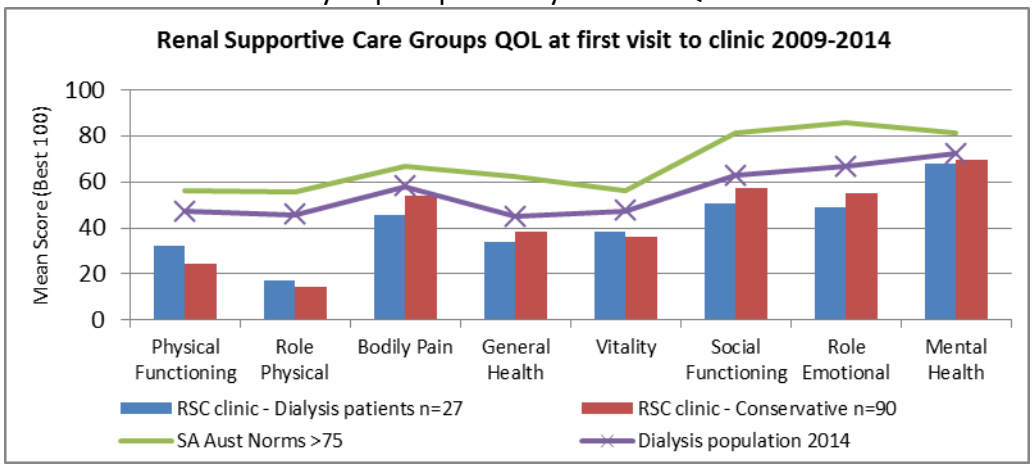


Figure 5: Renal Supportive Care clinic QOL results broken down into conservative and dialysis patient groups

The figure 5 represents both the dialysis patients and the conservatively managed patients who visit the RSC clinic and their initial QOL scores at their first visit. These are compared to the general dialysis population of 2012 and the South Australia (SA) normal population for people aged over 75 years. It shows that those people who are actively treated with dialysis who have difficult to manage symptoms have a QOL that is very poor physically compared to the general dialysis population, and the QOL close to that of the conservatively managed group (no statistical significance). Although QOL is difficult to shift with symptom management alone due to the many factors that influence a patient's interpretation of their own QOL, managing patients within a RSC clinic provides the patients access to expert symptom management advice, treatment and support.

Transplant

Renal transplantation is not a cure for kidney failure but an alternate form of renal replacement therapy (RRT). Not every patient is eligible for a transplant as there are strict medical criteria that patients must meet. As such these patients are analysed separately to dialysis patients. Overall, the transplant QOL scores are very close to the South Australian norm population.

Table 7: Transplant patient characteristics 2010-2012

	2010	2012	2014
Age	53.8 ± 12.7	55.3 ± 12.9	58.1 ± 12.9
Male	63%	57%	57%
Diabetes	15%	13%	28%
Haemoglobin	134.6 ± 19.5	131.2 ± 16.7	128.2 ± 19.7
Haemoglobin <100g/L	5%	4%	9%
Albumin	38 ± 3.7	38.3 ± 3.6	34.7 ± 5.9
Albumin <30g/L	5%	2%	12%

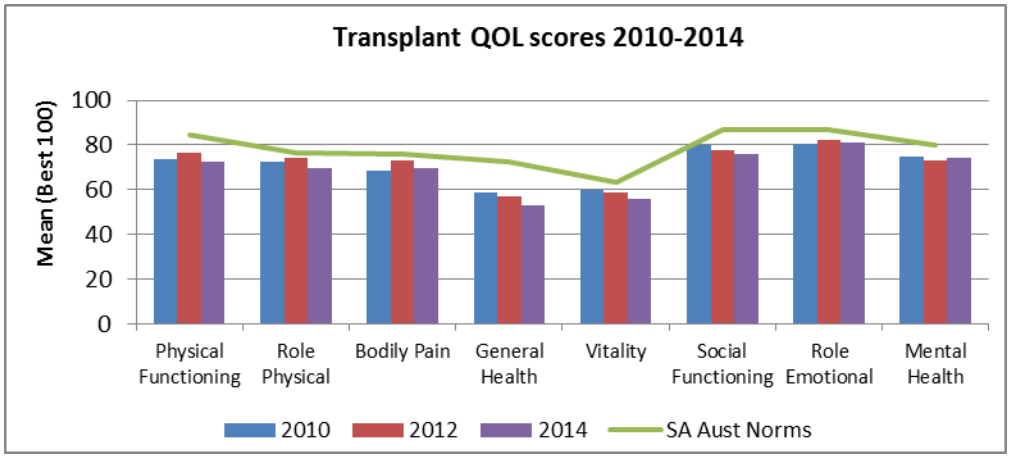


Figure 6: Transplant QOL scores 2010 - 2014 compared to the South Australian (SA) population

Transplant patient scores have not changed since data collection commenced in 2010. Scores are similar to the Australian population scores in every parameter of QOL. Transplant patients are a mix of deceased donor and live donor transplants, so some of these patients commenced RRT on a mode of dialysis, while some have never had any dialysis. Regardless, the QOL is significantly better than the dialysis population.

Conclusion

Recommendations to improve QOL in dialysis patients include early referral, anaemia management, calcium/phosphate management, adequate dialysis, nutritional support and exercise. The St George renal unit currently employs these recommendations with the exception of exercise where there is no current program, but there are plans for this to occur should funding ever become available.

The results of the SF-36 survey shows a difference in the self-reported QOL of patients between the dialysis modalities. Home haemodialysis patients have better physical quality of life scores compared to peritoneal dialysis and hospital haemodialysis. Although part of this includes a selection bias this has implications for the renal unit with regards to promoting the home haemodialysis option to all eligible patients.

References

Dal Grande, E. (2004) *Quality of Life in South Australia as measured by the SF-36: Population Norms for 2002, Trends from 1994 to 2002 and Impact of Chronic Diseases and Health Risk Factors on Quality of Life*, online at http://www.dhs.sa.gov.au/pehs/PROS.html

Population Research and Outcome Studies Unit *(2004), Department of Human Services, SA available at website*: http://www.health.sa.gov.au/pros/portals/0/quality-life-sf36-04.pdf

Ware, J. (1993) *SF-36 Health Survey. Manual and Interpretation Guide*. QualityMetric, Inc. Lincoln, Rhode Island

8. Hypertension Unit 2014

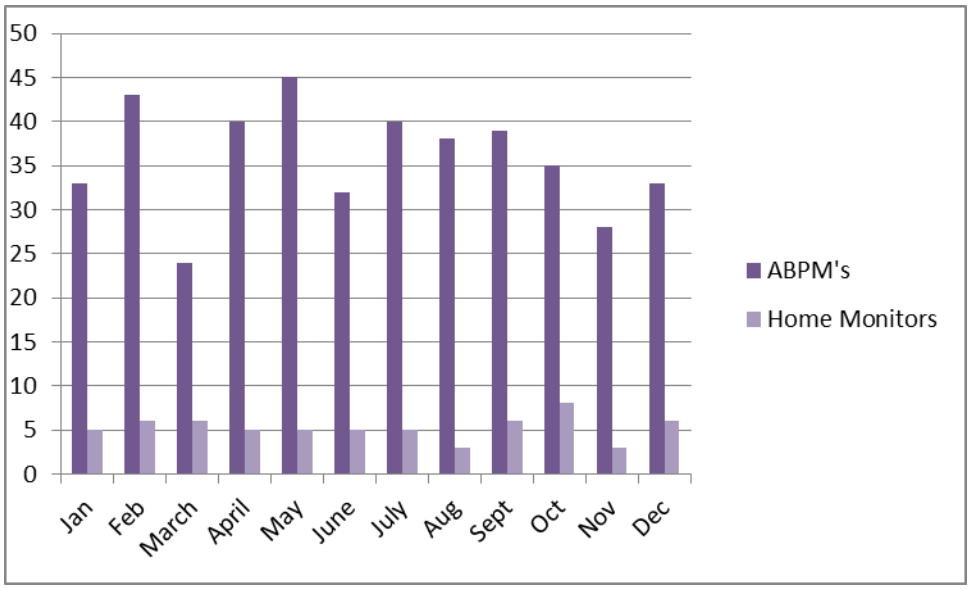
Ambulatory Blood Pressure Monitoring (ABPM) and validation of home BP monitors

We continue to deliver a busy ABPM service to our specialists and for research. ABPM remains the gold standard for clinical blood pressure management, and is even more important now that masked HT has been recognised along with white coat hypertension. In pregnancy ABPM is used in the first 20 weeks to distinguish true (chronic) HT from white coat/office HT.

This year we had 450 bookings for 24hr Ambulatory Blood Pressure Monitoring, 20 of these people did not attend for their appointment, leaving a total of 430 ABPMs completed for the year. Of these;

- 31 of these were on pregnant woman
- 77 were for research purposes

65 home monitors were checked for accuracy



Renal Angiography

Only highly selected hypertensive patients are studied, generally younger patients (for exclusion of fibromuscular hyperplasia) and occasionally older patients who have been carefully investigated with other tests. A/Prof Mangos continues to perform these in association with the Cardiology dept.

Renal Sympathetic Nerve Ablation

One renal denervation was attended in February 2014. The role of renal denervation in management of HT is questioned following the Symplicity-3 trial publication early in 2014. We will continue to use this treatment in highly selected patients who have failed other treatments.

9. HYPERTENSION IN PREGNANCY

Aims:

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

Maternal outcome aims:

Episodes of severe hypertension <30% (CHIPS) [1]
CS rate in nulliparous women <30% [2]

Fetal outcomes:

SGA rates <16% overall (GH<14, PE<26, EH<14, EH+PE<22%) [3]
PNM rate of <10/1000

Women are managed in line with a unit protocol by both the high-risk obstetricians and the obstetric medicine physicians at consultant level.

- All women presenting with PE before 37 weeks are delivered once they reach 37 weeks even in the absence of an intervening complication.[4]
- Pre-term deliveries (<37 weeks) are performed in the event of a specific maternal or fetal complication and in consultation with the consultant.
- Induction of labour with the aim of a vaginal delivery is the preferred mode of delivery with Caesarean sections reserved for those with previous CS, failed inductions and the emergent setting.
- All women <33 weeks gestation with a growth restricted baby who look as though delivery is imminent are transferred out in-utero to a level 6 unit.
- Episodes of severe hypertension are defined as SBP ≥170mmHg ± DBP ≥110mmHg

Activity:

There were 2620 Pregnancies at St George Public in 2014.

- Of these 227(9%) Pregnancies were complicated by hypertension in pregnancy.

207 consultations were made to the Renal Obstetric Medicine group.

There were 683 DAU (day assessment) attendances throughout the year.

There were 488 attendances at the Monday obstetric medicine clinic

10 were twin pregnancies and analysed separately.

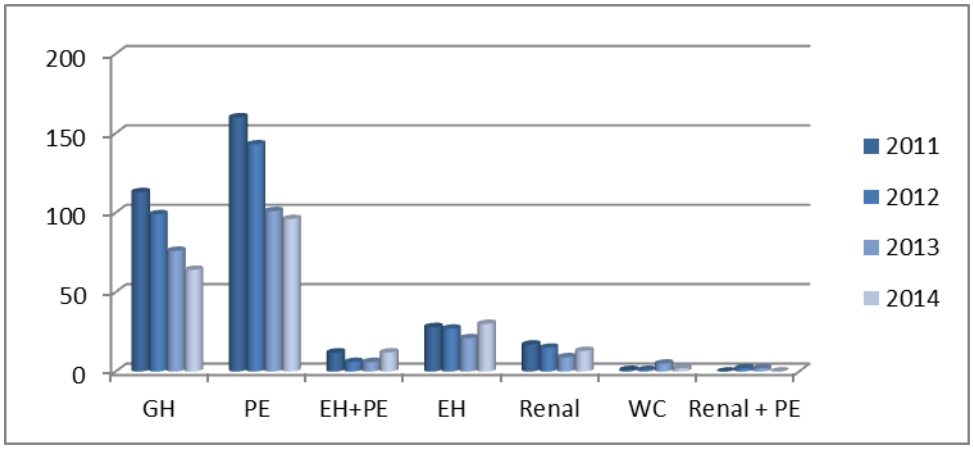
The 4 pregnancies listed as other had the following diagnosis - 1 cholestasis & 3 at risk.

No episodes of Pulmonary Oedema or cases requiring dialysis occurred.

There was **one peri-natal death** in the context of severe early onset PE and placental abruption.

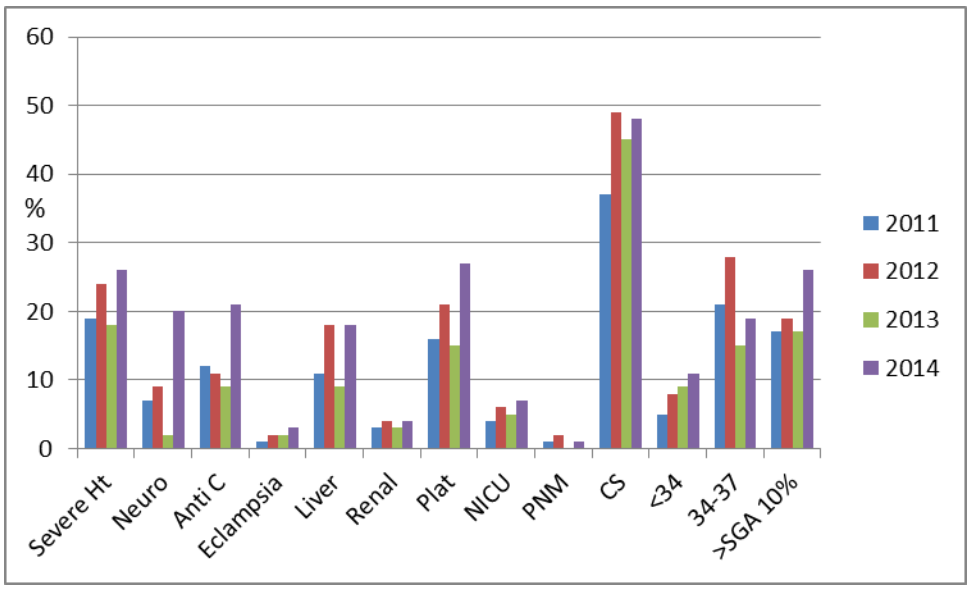
There were no maternal deaths.

Comparison 2011-2014 diagnosis of women with Singleton Pregnancies



The apparent reduction in cases of GH and PE is due to restricting these analyses to women managed in St George public hospital; prior to that women managed at HPH and St George Private were also included.

Trend in outcomes of PE for singleton pregnancies 2011-2014



Singleton Pregnancies

	No	Severe HT (%)	Neuro (%)	Anit C (%)	Eclampsia (%)	Liver (%)	Renal creat >90 (%)	Platelets <150 (%)	SGA <10 (%)	NICU (%)	PNM (%)	CS rate (%)	<34/40 (%)	>37/40 (%)
GH	64	6(9)	0	0	0	1(2)	0	3(7)	5(8)	0	0	21(46)	2(4)	4(9)
PE	96	25(26)	19(20)	20(21)	3(3)	17(18)	4(4)	26(27)	22(26)	7(7)	1(1)	46(48)	11(11)	18(19)
EH+PE	12	5(42)	3(25)	2(17)	0	1(8)	1(8)	3(25)	2(17)	2(17)	0	10(83)	2(17)	5(42)
EH	30	4(13)	0	0	0	0	0	0	5(17)	0	0	14(47)	0	2(7)
Renal	9	0	0	0	0	0	2(22)	0	1(11)	0	0	5(56)	0	0
Other	4	0	0	0	0	1(25)	1(25)	0	0	0	0	3(75)	0	0
WC	2	0	0	0	0	0	0	0	0	0	0	1(50)	0	0

GH = Gestational hypertension, PE = Preeclampsia, EH+PE = Essential Hypertension + Preeclampsia, EH = Essential hypertension, WC – White coat

Twin Pregnancies

	Number	Severe Htn (%)	Neuro (%)	Anti C (%)	Eclampsia (%)	Liver (%)	Renal Creat >90 (%)	Platelets <150(%)	SGA <10%(%)	NICU (%)	PNM (%)	CS rate (%)	<34/40 (%)	<37/0 (%)
GH	0													
PE	8/16	3(38)	2(25)	2(25)	0	5(63)	0	4(50)	8(50%)	2(13)	0	5(63)	0	4 (50)
EH +PE	0													
EH	0													
Renal	2/4	0	0	0	0	0	0	0	0	0	0	2(100)	0	2(50)
WC	0													
GH	0													

GH = Gestational hypertension, PE = Preeclampsia, EH+PE = Essential Hypertension + Preeclampsia, EH = Essential hypertension, WC – White coat

Conclusion:

1. It appears from this year's report that we are seeing fewer women with uncomplicated GH. This may however be a reflection of suboptimal data collection rather than a true reflection of decreasing incidence.

2. Outcomes continue to be favourable for both maternal and fetal indicators.

    a. Our severe hypertension rate among women of 22.5% compares favourably with those published in the recent CHIPs trial where the rate amongst those in the tight control group was 27.5%. [1]
    b. High CS rates in women with both EH and EH+PE have been attributed to by multiparity with a previous CS and a higher proportion of private patients of older age electing to have a CS.
        i. Amongst the nulliparous however the rate was 46% which is higher than the NSW average.
    c. There was just one peri-natal death/237 infants delivered which gives us a PNM rate of 4.2/1000 which is well below the 8.6/1000 rate for NSW. [2]
    d. SGA rates were also comparable to reported rates amongst hypertensive women. [3]

1. Less-tight versus tight control of hypertension in pregnancy. Larua A Magee et al. NEJM January 29, 2015 vol.372;5
2. NSW Mothers and Baby report 2006
3. The effect of hypertensive disorders in pregnancy on small for gestational age and stillbirth: a population based study
4. Induction of labour versus expectant monitoring for gestational hypertension or mild pre-eclampsia after 36 weeks' gestation (HYPITAT): a multicentre, open-label randomised controlled trial. Koopmans et al. Lancet September 2009 Volume 374, No. 9694
5.Victoria M Allen1*, KS Joseph2, Kellie E Murphy3, Laura A Magee4 and Arne Ohlsson5
BMC Pregnancy and Childbirth 2004, **4**:17

10. CHRONIC KIDNEY DISEASE

Saiyini Pirabhahar and A/Prof Ivor Katz

The group of patients being reported upon in this report are those patients seen in the general nephrology and hypertension clinics at St George Hospital. The guidelines for referral as outlined by the Kidney Check Australian Task Force (KCAT) are outlined below.

Indications for referral to a Nephrologist*

- reduced rates of progression to ESKD
- decreased patient morbidity and mortality
- decreased need for and duration of hospitalisation
- increased likelihood of permanent dialysis access created prior to dialysis onset
- increased likelihood of kidney transplantation
- timely predialysis education**

**This group of patients are captured in our pre-dialysis group and are referred to this clinic when their eGFR<20ml/min/1.73m^2

Referral to a specialist renal service or Nephrologist is recommended in the following situations:

1. eGFR < 30 mL/min/1.73m2
2. Persistent significant albuminuria (urine ACR ≥30 mg/mmol)
3. A consistent decline in eGFR from a baseline of < 60 mL/min/1.73m2 (a decline > 5mL/min/1.73m2 over a six-month period which is confirmed on at least three separate readings)
4. Glomerular haematuria with macroalbuminuria
5. CKD and hypertension that is hard to get to target despite at least three antihypertensive agents
6. Also take into account the individual's wishes and comorbidities when considering referral.

Referral is not necessary if:

- Stable eGFR ≥30 mL/min/1.73m2
- Urine ACR < 30 mg/mmol (with no haematuria)
- Controlled blood pressure

We have been analysing the referral pattern to our department against these advised referral criteria by KCAT. This forms part of an analysis of referral patterns and as part of an audit to evaluate alternative ways of servicing our general practitioners and patients with CKD at levels not yet being considered for dialysis or a non-dialysis supportive pathway.

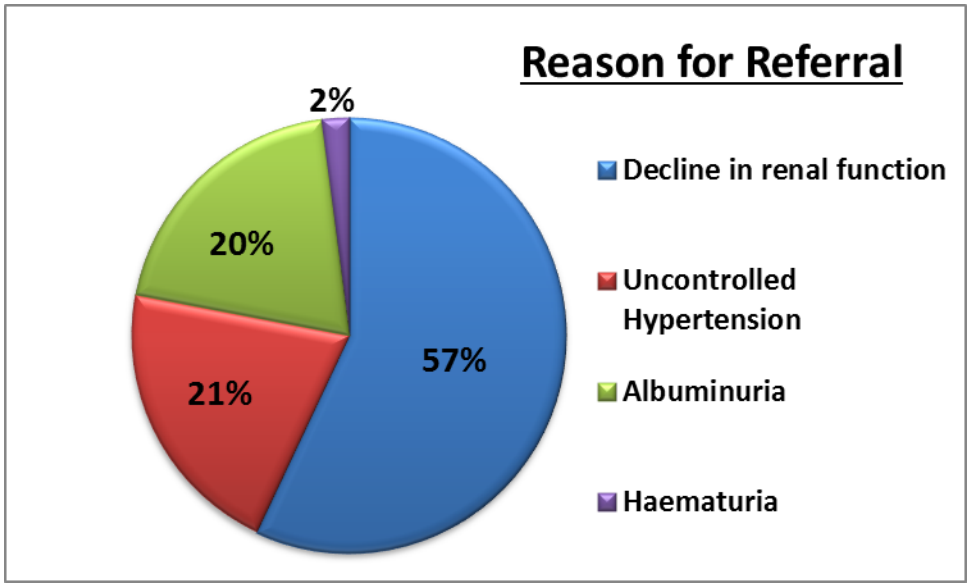


Figure 1. Reason for referral to outpatient department nephrologist

What is clear is that general practitioners require decision support on patients who fit outside of these standard advised referral criteria. Whilst most patients are referred due to a decline in renal function there remains great uncertainty about chronicity of the decline and about an approach to managing this recent decline. It should be pointed out that many of the patients have an eGFR >45mls/min/1.73m^2.

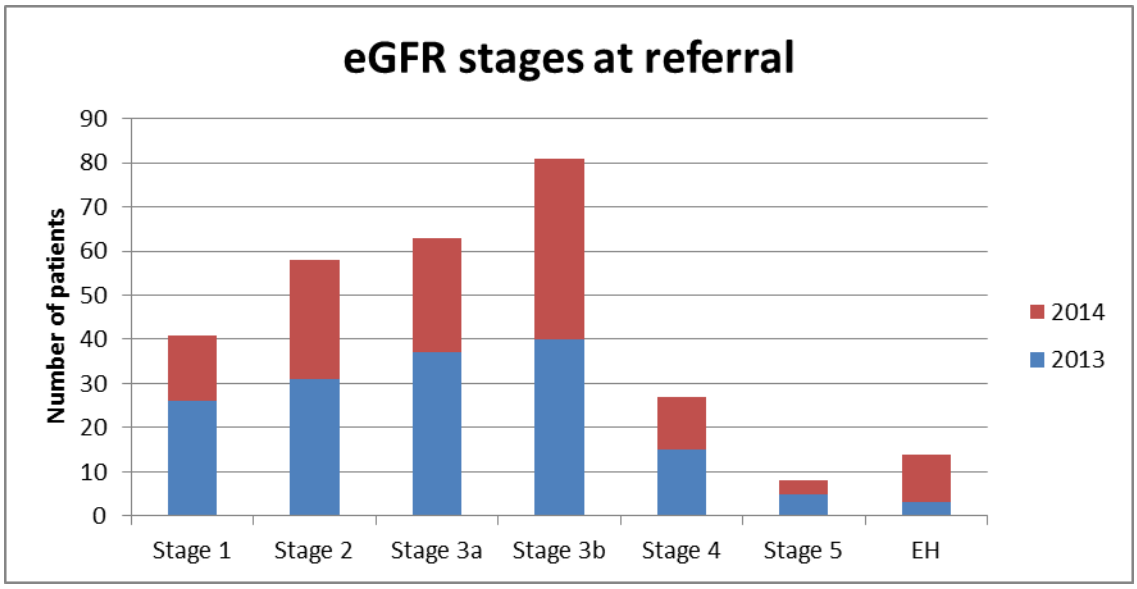


Figure 2. The estimated glomerular filtration rate (eGFR) stages at referral

From figure 2 it can be noted that most of the referrals were with eGFR of 30-59ml/min/1.73m^2 (stages 3a and 3b). KCAT guidelines for referral are patients with eGFR consistently <30ml/min/1.73m2. Only a total of 8 patients in the last two years were referred with an eGFR <15ml/min/1.73m^2. This is positive and is in keeping with data presented elsewhere in this annual report indicated around 20% late referrals for dialysis.

The second most common reason for referral is for uncontrolled hypertension. Whilst the guidelines suggest referral for "CKD and hypertension that is hard to get to target despite at least three antihypertensive agents", this is not the case. Again it is often firstly about establishing whether control is achieved and secondly about what medications to use. There were 11 essential hypertension (EH; figure 2) patients referred with no evidence of any kidney damage who were referred in the last year i.e. 2014.

There is a need to evaluate what support is required by GPs in order to provide an improved service.

Annual intake of new patients

Data was collected from 3 out of 4 Renal outpatient clinics at St George hospital. There were 159 new referrals in 2013 and 139 patients in 2014 who were referred to the public outpatient clinic.

It should be noted that there are 8 nephrologist in the St George and Sutherland Hospital area and that most of the CKD patients are seen in the private sector.

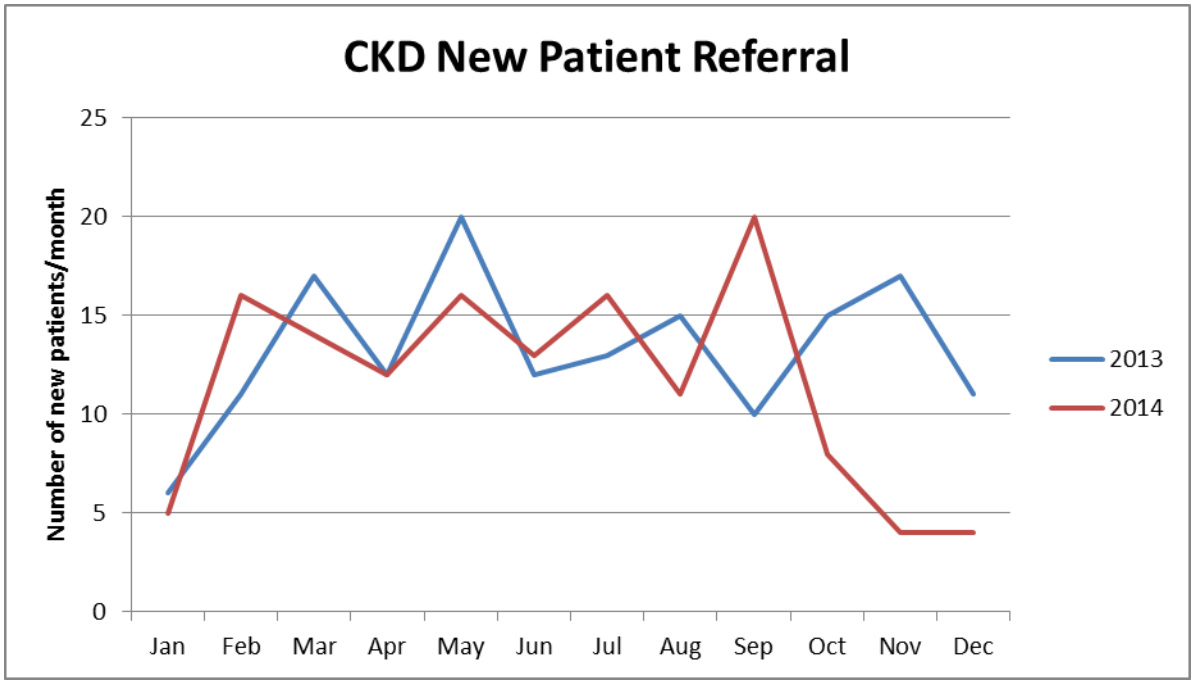


Figure 3. New Chronic Kidney Disease Patients referred each month

Age at Referral

The age at referral was influence by the stage of their CKD. The majority of patients referred were in the elderly category i.e. >60years of age. In this age group decline in renal function is associated with ageing termed (ageing nephrosclerosis) in many and is considered as part of the 'normal' ageing process. The implications for having an abnormal eGFR at these ages is often more reflective on cardiovascular risk rather than likelihood of requiring dialysis. In fact only 1 in 20 of these patients will ever require dialysis as most are more likely to die of cardiovascular disease before dialysis is needed.

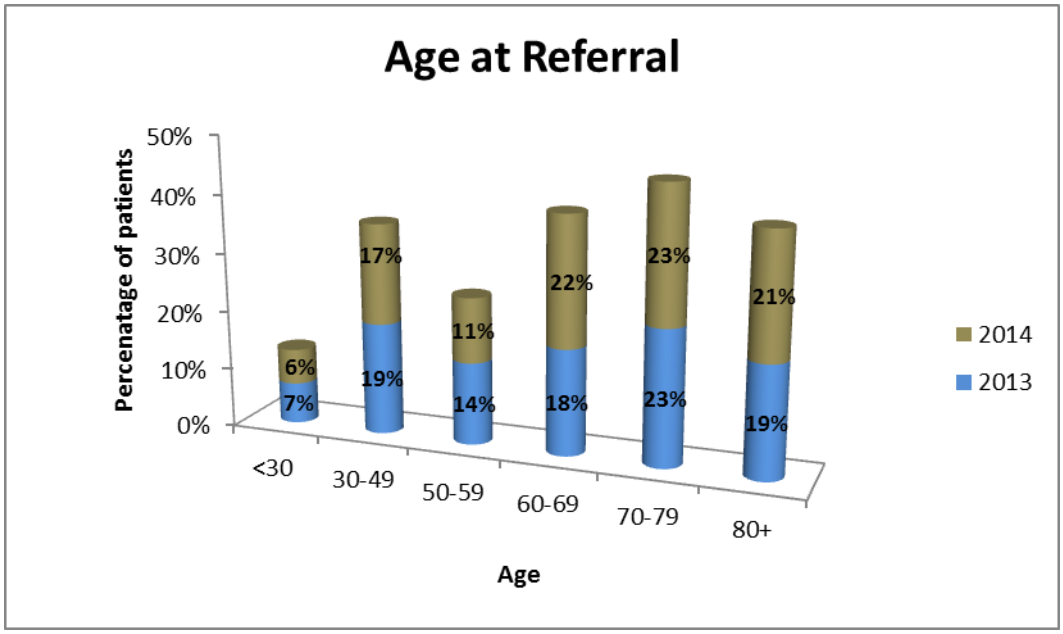


Figure 4. Age at time of referral

Age of referral was strongly influenced by stage. With higher stage CKD patients being older. Table 1 below demonstrates the difference in age by stage and also outlines the underlying suspected disease at time of referral. Diabetes is the most common diagnosis at referral.

Table 1. Demographic Information of patients referred to renal out patient service

	Stage 1	Stage 2	Stage 3a	Stage 3b	Stage 4	Stage 5	Essential HTN
N=	15	27	26	41	12	3	11
Age	41 (10)	64(16)	69(14)	73(11)	73(18)	70 (28)	45(15)
Male	47%	48%	65%	51%	50%	33%	9%
Female	53%	52%	35%	49%	50%	67%	91%
BMI	32 (8)	26(9)	29(6)	30(6)	24(10)	28(7)	26(6)
Primary cause							
Presumend GN	27%	7%		2%	8%		9%
GN (all types)	7%	4%		2%			9%
Diabetic nephropathy	33%	8%	15%	22%	26%	33%	
Renal vascular disease (nephrosclerosis)		37%	38%	52%	50%	34%	9%
Renal vascular disease - hypertension		18%	5%	2%			
SLE	13%	4%			8%		
Pyelonephritis		7%				33%	
Loss of single kidney			4%	8%			
Obstructive nephropathy			4%				
Reflux nephropathy							9%
Amyloid disease				2%			
Calculi				2%			
Others	13%	11%	7%	8%	8%		55%
UNK	7%	4%	27%				9%
Blood Creatinine	64 (14)	83(17)	111(16)	144(21)	209(41)	337(161)	58(9)
eGFR	>90	72(9)	52(4)	35(6)	23(3)	14(3)	>90
Alb:Crt	89.6(146)	6.7(9)	54.1(190)	91.7(258)	63.2(53)		2.5(2.6)
missing values (n=4)							

Co-morbidity seen in CKD Patients referred to clinics

The most common risk factors in CKD are diabetes, hypertension, cardiovascular disease and dyslipidaemia. In year 2014 about 85% and 57% patients respectively were on treatment for hypertension and dyslipidaemia respectively.

Risk factors are accumulative in their associated risk for CKD. The more risk factors present the greater the risk for developing CKD

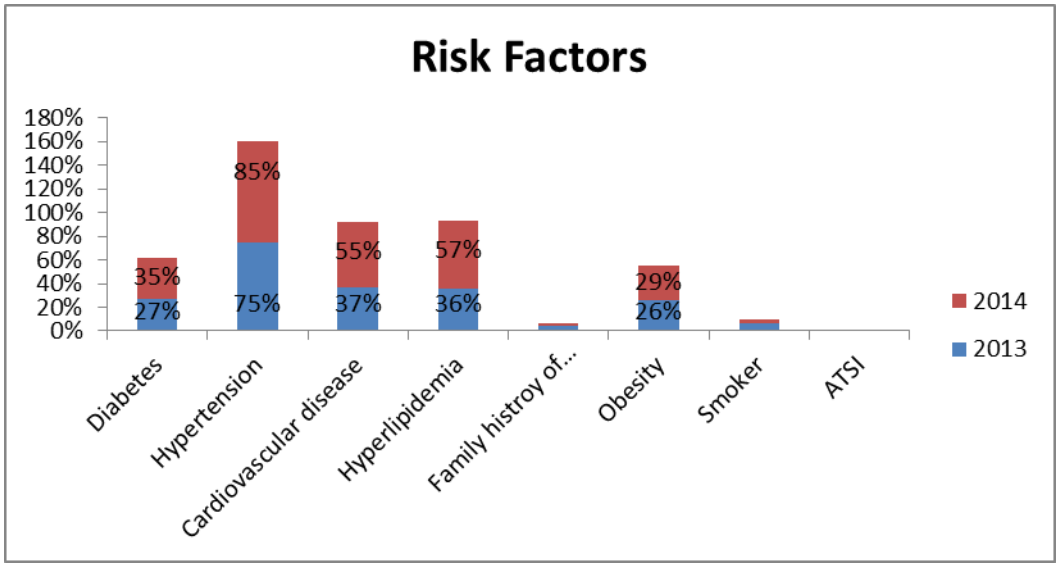


Figure 5. Risk Factor profile of patients referred to general nephrology outpatient clinics

Albuminuria

One of the most important factors influencing the likelihood of deterioration of a person's CKD is the presence of albuminuria. In table 2 below we outline the referral number of patients by CKD stage and by albuminuria.

Albuminuria is a major predictor of cardiovascular morbidity and mortality. Both reduced eGFR and significant albuminuria are independent risk factors for cardiovascular disease (CVD).

Table 2: Number of patients with albuminuria and low eGFR (N=100)

Kidney function stage	GFR (ml/min/1.73m2)	Normal (urine ACR mg/mmol) Male: <2.5 Female:< 3.5	Microalbuminuria (Urine ACR mg/mmol) Male: 2.5-25 Female: 3.5-35	Macroalbuminuria (Urine ACR mg/mmol) Male: >25 Female: >35
1	≥ 90	1	6	5
2	60-89	13	9	1
3a	45-59	7	8	4
3b	30-44	7	9	6
4	15-29	1	1	5
5	<15	1	1	

Table 2 : Patient Characteristics (2014 Referrals)

11. EDUCATION – TRAINING AND SATISFACTION 2014

Dr Cathie Lane

Performance measures

ISSUES FOR DISCUSSION AT BUSINESS MEETINGS AND ANNUAL REPORT	OUTCOME MEASURE & Method	ACHIEVEMENT STATUS 2014
		A = Achieved **PA = Partially Achieved** **NA = Not Achieved**
• **JMO feedback (annual)** • **BPT feedback (annual)** • **Advanced trainee feedback (annual)** • **Student feedback (annual)** • **Review of weekly clinical meetings (annual)**	• **JMO evaluation forms (CETI)** • **BPT evaluation forms (CETI)** • **Exit interviews with AT (deidentified and cumulative results to ensure anonymity)** • **Student evaluation forms** • **Currently informal feedback**	• **A** • **A** • **PA – one interview not completed** • **A** • **NA**

2015 MEDICAL STUDENTS (phase 3 i.e. yr. 5 and 6)

- **Number**: 3 of possible 11 (27%). Poor response rate attributed to new student administrative officer who was unaware until midway through year regarding need for evaluations. Number of evaluations ranges from 3 – 7 per annum since 2010. Average 5

Format of feedback: UNSW faculty of Medicine general feedback form.

Best features of term:

- Being included and incorporated into team valuable and appreciated.
- Teams regarded as friendly and welcoming.
- The registrars and residents were a significant source of teaching and seen as highly motivated and enthusiastic teachers.

Areas that could be improved:

- requests for more bedside and case-based teaching catering toward student knowledge and standards
- Less enthusiastic regarding feeling supported to develop clinical learning opportunities but only 3 feedback forms.

JMO

Number: 8 feedback appraisals from 2014. (possible 12). Response rate 67% (range since 2010 67%- 87%)

Format of feedback: Prevocational term evaluation form from the NSW Institute of Medical Education and Training (now CETI).

Usefulness of term: Highly useful = 67% ; Useful=33%

Orientation received by 100% and felt it was representative

In other years registrars had been identified as greatest source of guidance and supervision but this has now reduced to 50% with half the respondents identifying the consultant the primary source. This may not be the most favourable weighting as registrar teaching opportunities not being maximised.

Supervision regarded as of high quality.

The learning and teaching opportunities were rated very highly and met the stated objectives. Formal teaching was received by 100% of JMOs

100% would regard the overall term as being clinically important and useful and 88% would recommend the term to colleagues. The majority of responders felt they had improved clinical and communication skills at the end of the term.

One respondent identified ward rounds as not occurring regularly.

100% felt the clinical workload was appropriate.

The majority identified nursing and allied health staff as being approachable.

BPTs

Number: 3 0f 4 completed term evaluations i.e. response rate of 75%

Format of feedback: 'The Basic Physician Trainees Term Evaluation' for the St George Network from CETI

Teaching and learning generally scored high within term. Clinical skills were felt to improve following the renal term, less so with communication skills (would anticipate communication skills already fairly advanced at this point in career pathway).

Workload and autonomy was viewed as appropriate. The degree of paperwork expected from BPT was rated mod to high but there is no intra-disciplinary comparison available.

Welcoming and supportive atmosphere was identified and term was described favourably in terms of learning opportunities in general

Advanced Trainees

Cumulative results over several years to provide anonymity. Most face to face interviews. Some undertaken as telephone interviews and emails.

.

- What is the pervasive culture in the department,
- Whether it's a welcoming unit,
- Whether it offers a good case mix and
- Whether there is adequate clinical exposure and
- Whether there are strengths we are not yet capitalising on
- Whether we have areas that need strengthening.

3 interviews not undertaken since 2010 (usually 3-4/year) Aspects of interviews which tended to recur

Strengths:

- CNC support excellent.
- Dialysis nursing staff show mature approach and willing to accept ownership of patients
- Trainees only on-call on the weekends. Weekend on-call felt to be a useful learning opportunity. Other sites have weekday on call which is very difficult and represents heavy workload
- Welcoming unit- all staff members. Supportive consultant base. Not intimidating and approachable.
- Sense that department cares about the individual trainee
- Being part of a training unit seen as a strength since assured of coverage of all clinical areas.
- Case-mix at StGH seen as favourable. Note made that transplantation exposure is good and compares favourably to smaller transplanting units
- Thursday meetings very useful. Feel that journal club would be more useful if focus wasn't on critiquing literature but more informal discussions and reviewing more journals in a session
- The new ultrasound machine is helpful for biopsies and the biopsy process runs smoothly.
- Supportive Care Clinic (Non-Dialysis Pathway) – very good. Not offered elsewhere and should be capitalised upon.
- Renal Donor Clinic also a great opportunity for STGH as not offered elsewhere but not many donors and the ability to follow through with individual donors limited by rotational changes
- Obstetric Clinic valuable but has opportunity for improvement (see below)
- Orientation seen by all as very helpful. Newcomers to hospital found orientation clashed with hospital orientation which proved very problematic.
- One very important aspect of orientation was the education of junior staff that patient responsibility was left with them when ATs were in clinic. The transparency of this fact at the time of orientation was felt to be extremely helpful.

Opportunities:

- Utilise CNCs for educational and training opportunities – eg how to identify a fistula/graft stenosis. Several trainees whilst recognising the great asset of the vascular CNC, acknowledged the downside was the removal of advanced trainee exposure and interaction with the vascular team.
- PD training could be capitalised upon since very variable exposure at other units
- Obstetric focus could be strengthened and developed with respect to training. Although recognised amongst trainees that STG offers obstetric medicine its training (education delivery) is not as strong as RNS.
    - Felt that the exposure is micromanaged here and that too top heavy in the management- leaving registrars with little learning opportunities
- Clinical workload heavy and particularly so for a first year trainee. Balanced to some extent by the fact that trainees only on-call on the weekends. Workload is a recurrent theme with StGH seen as a busy unit and 'burnout' mentioned several times. Felt by most to be a stressful rotation with pressure to perform at a high level. Clinic responsibilities heavy, particularly if someone away. Some trainees felt there were clashes between clinics. These issues have been recurrent since 2010. The Monday afternoon clinic is always cited as the example when it clashes with consults and difficult ward cases.
- Quality of resident staff greatly affect workload but this is quite variable with some ATs commenting on the high quality and others note the low quality of junior staff

Summary of Training Satisfaction

1. Junior staff are generally satisfied with level of teaching and training.
2. Areas that could be focussed upon for basic physician and advanced trainees would be to adjust clinic/ward demands particularly for Monday afternoon clinic as this appears to be a recurring issue.
3. Advanced trainees identify the existence of training opportunities in peritoneal dialysis, greater use of CNCs for advanced training and feel greater autonomy required for maximising learning opportunities in Obstetric Medicine.
4. Ongoing value of advanced trainee satisfaction interviews is questionable given the time taken for this process and the issues of confidentiality if report is to be on an annual basis.

12. ST GEORGE RENAL BIOPSY REVIEW – AUDIT OF COMPLICATIONS

Data for the year 2014

	Total	Transplant biopsies
Number	123	50
Total complications	8(6.5%)	3 (6%)
Macroscopic haematuria	8(6.5%)	3 (6%)
Symptomatic Perinephric haematoma	1(0.8%)	0
Transfusion	0	0

One patient who had gross haematuria following a native kidney biopsy also developed a perinephric haematoma.

Comparison of total complication rates from previous years

	2007	2008	2009	2010	2011	2012	2013	2014
Total Number	58	67	107	85	109	86	118	123
Complication rate	9%	9%	7.5%	9.4%	10%	7.2%	5.1%	6.5%

Comparison of specific complication rates expressed as percentage (number)

Year N	2011 N=109	2012 N=86	2013 N=118	2014 N=123	Last 4 years N=436
Total complications	10(11)	7.2(6)	5.1(6)	6.5(8)	7.1(31)
Macroscopic Haematuria, %(n)	4.6(5)	3.5(3)	3.3(4)	6.5(8)	4.6(20)
Perinephric Haematoma, %(n)	4.6(5)	3.5(3)	1.7(2)	0.8(1)	2.5(11)
Perinephric bleed – angioembolisation, %(n)	0(0)	0(0)	0(0)	0(0)	0(0)
Required blood transfusion	1(1)	4.7(4)	0.8(1)	0(0)	1.3(6)

Bench marks (Am J Kidney Dis 60(1):62-73. 2012) are:

- Macroscopic haematuria 3.5% **- not met**
- Blood transfusion 1%- **met**
- Angio-embolisation 0.6%- **met**

There is no benchmark for symptomatic perinephric hematoma. The rate of complications over the last 4 years were not statistically different (Chi square statistic = 2.27, p =0.52).

After reviewing the literature and the practices of nearby renal units, it was decided to trial discharging the patients on the same day of biopsy from the start of Jan 2015. The data will be analysed in the future to compare outcomes following this change in practice.