Health
South Eastern Sydney
Local Health District

ANNUAL REPORT AND QUALITY INDICATORS 2013

Department of Renal Medicine
St George & Sutherland Hospitals

This is the 2013 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. Once this report was developed we met as a Unit and feedback helps us drive necessary change.

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 yet have an ongoing high involvement in 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 2013 with untied support and we appreciate the support from:

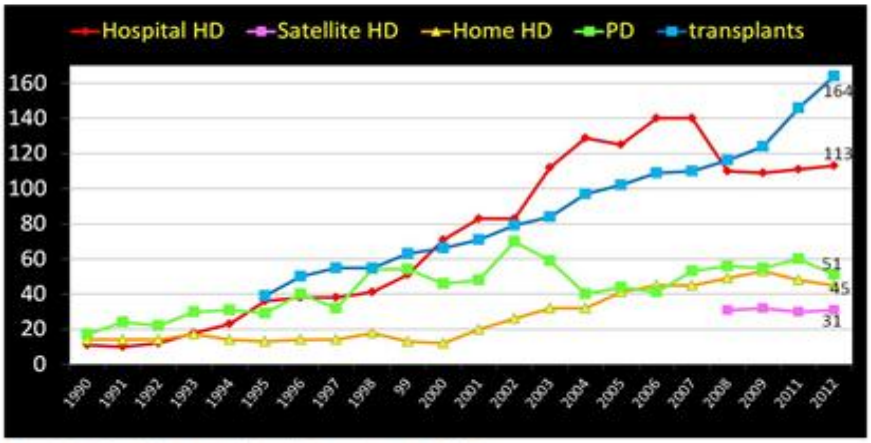
- ALEXION
- AMGEN
- BAXTER
- BOEHRINGER INGELHEIM
- NORVATIS
- PFIZER
- ROCHE
- SANOFI
- SHIRE

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

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

1. EXECUTIVE SUMMARY

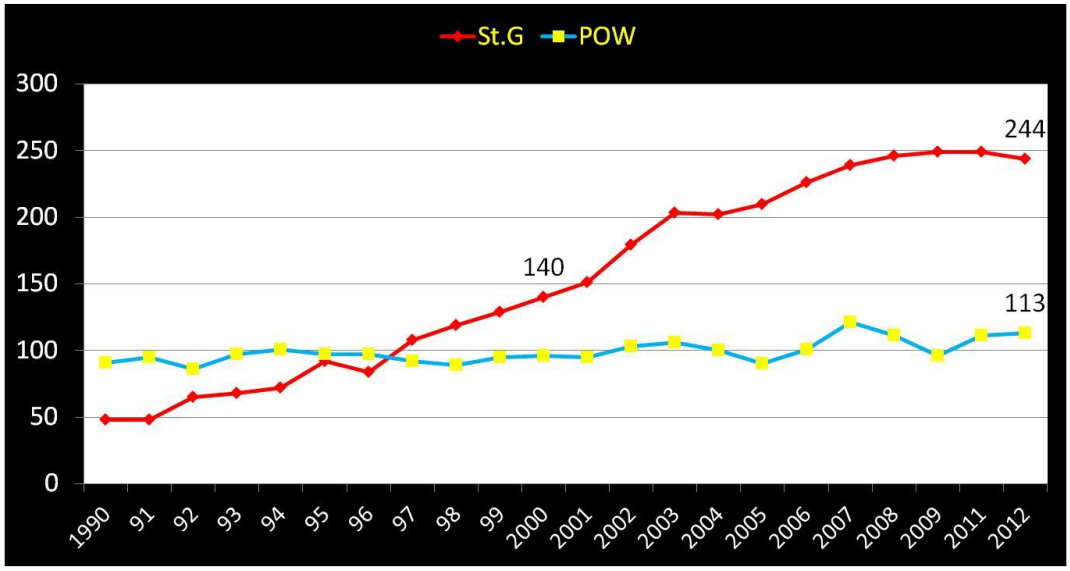
Dialysis & transplant patients St.George 1990-2012



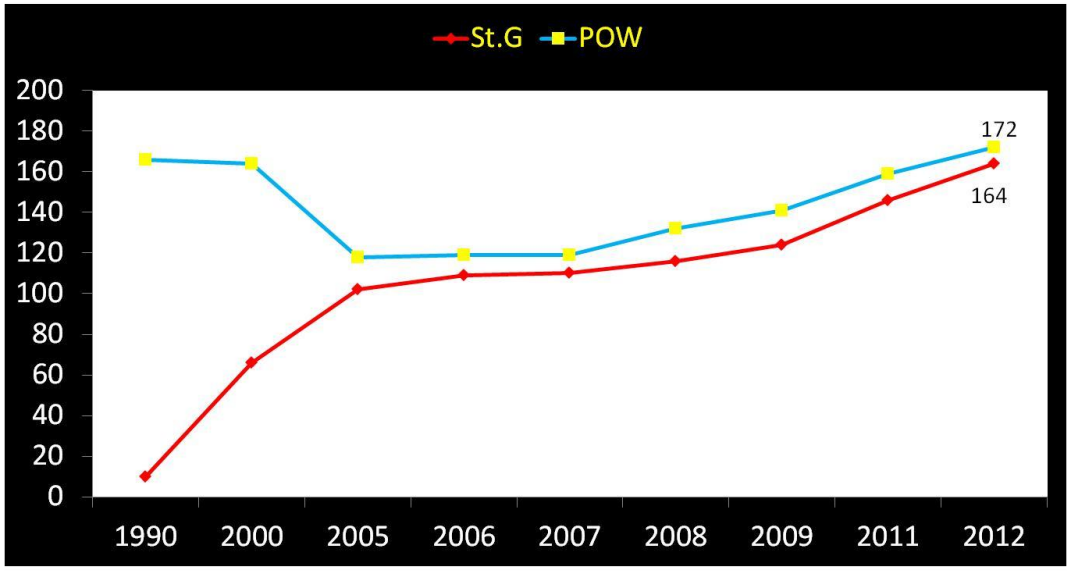
NB. Hospital HD includes potential satellite patients until 2008

ANZDATA 31/12/12

Dialysis patients South East Sydney LHD



Functioning Transplants South East Sydney LHD



ANZDATA Dec 2012

Activity 2012-13 Visits

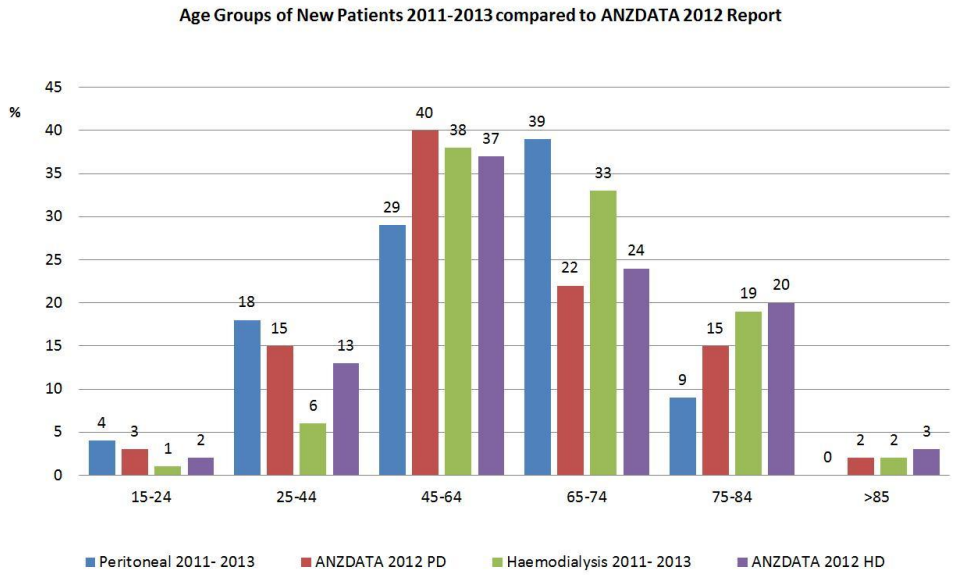
- General nephrology clinics — 1947
- 4 west nephrology clinics — 4169
- Total — 6116 (2% rise; 5999 in 2011-2)

- Pre-dialysis — 180 (199 2011-2)
- VAN clinic — 340 (371 2011-2)

- 4 west HD — 15257 (17817 2011-2)
- TSH satellite — 5079 (4651 2011-2)
- Total HD — 20336 (9.5% fall; 22468 2011-2)

- PD average no. patients per month — 55 (60 in 2011-2)

Commencing dialysis

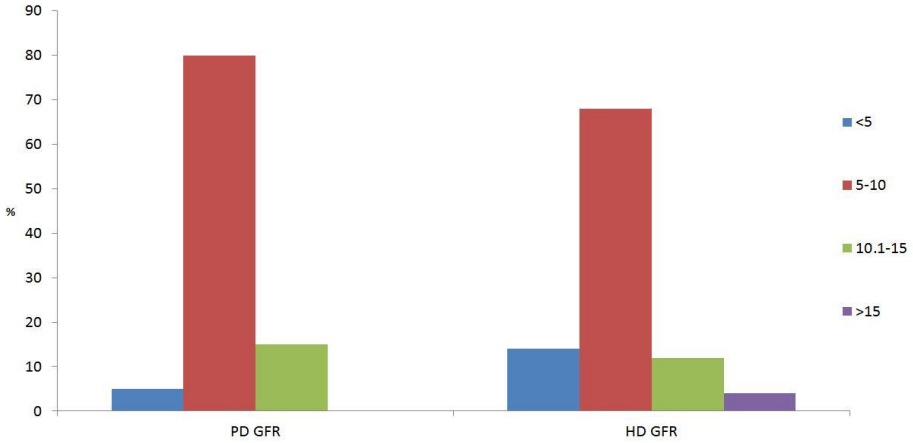


New Patients

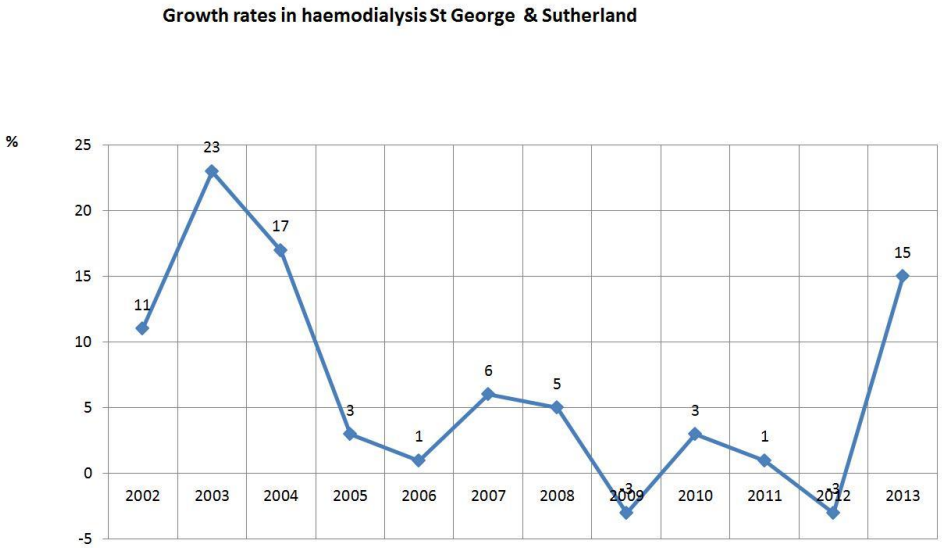
- 7(12%) late referrals - below the National average (22%).
  - All late referral patients received haemodialysis
- we commence fewer patients on PD as their primary modality in the 45-64 age group but start more patients than nationally in the 65-74 age group
- Fewer new patients were obese and fewer late referrals than nationally
- co-morbidity burden was fairly similar to National

- ***we are accepting patients for dialysis who have a fairly similar profile to those nationally and there is no major departure from standard practice***

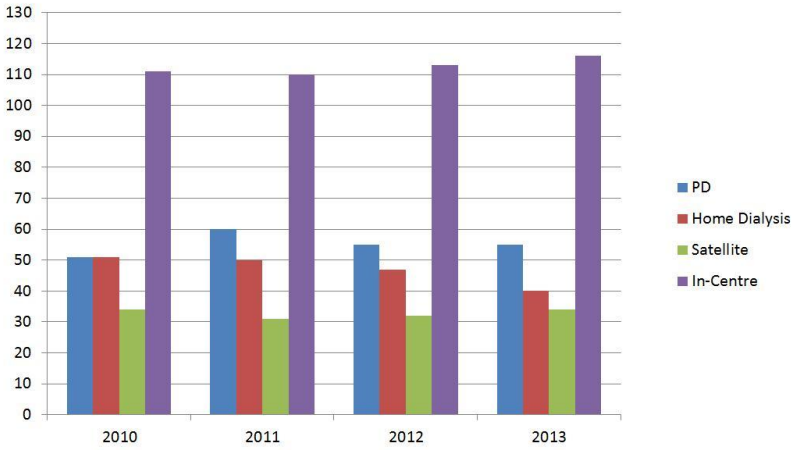
New Patients eGFR



Acute & Chronic HD

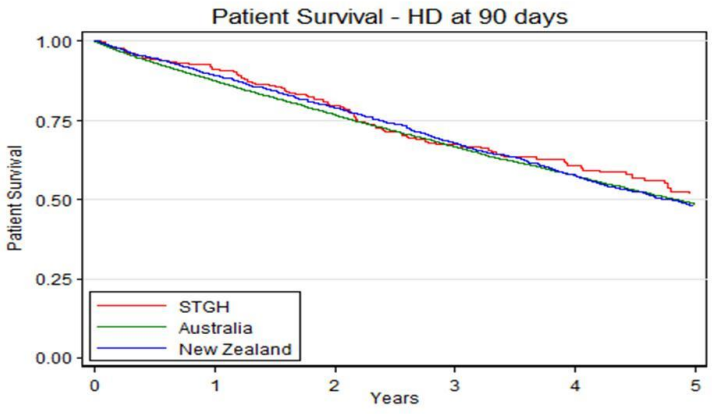


Dialysis modalities



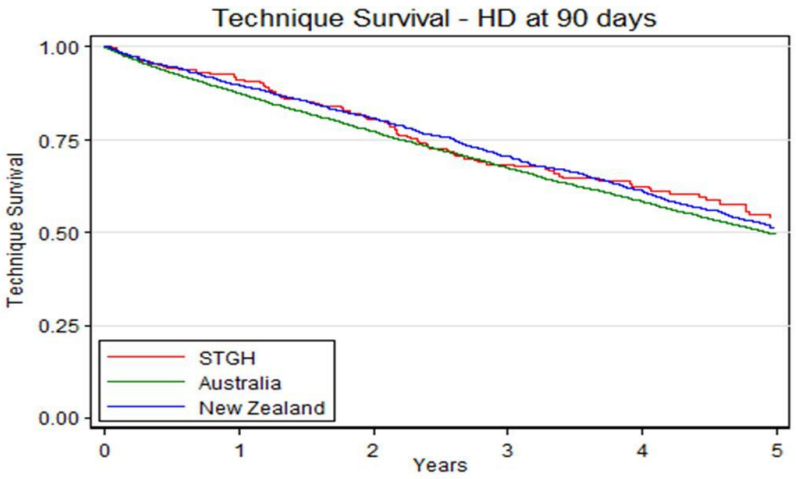
38 % of St George patients are dialysing on a home therapy (PD and HD) compared to 27% nationally

HD patient survival



Data are for 301 patients dialysed from 2003 to Dec 31st 2012.
one year survival of 91% and 5 year survival 52%,

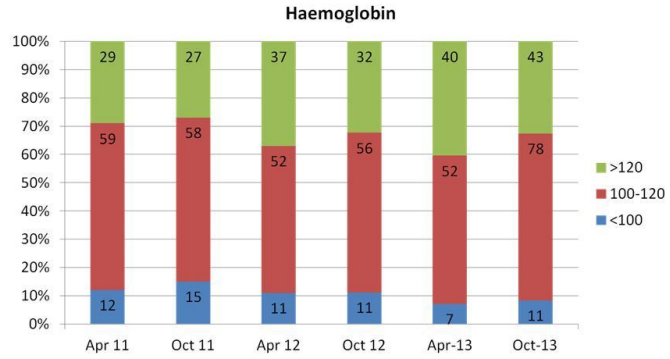
HD technique survival



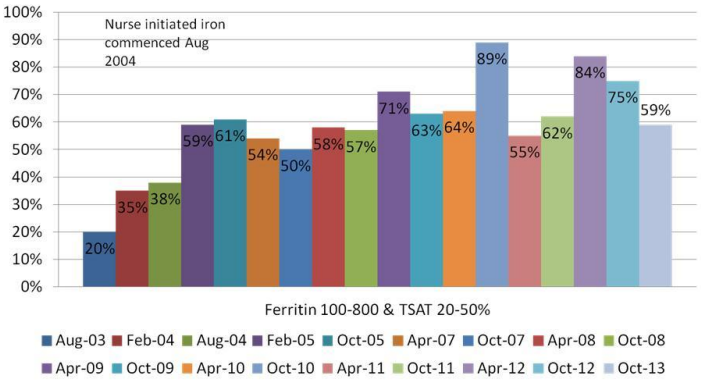
HD Blood results

Parameter	Target	Apr 11	Oct 11	Apr 12	Oct 12	Apr 13	Oct 13	ANZDATA 12
Ca	2.25-2.58 mmol/L	65	59	64	51	60	57	-
Corr Ca	2.1-2.4 mol/L	31	40	42	54	49	40	-
PO4	0.8-1.6 mmol/L	55	62	64	65	62	61	-
$CaPO_4$	<4.0 mmol/L	62	70	74	70	71	67	67
Ferritin	200-800 ug/L	72	74	75	67	76	69	60
Fe Sats	20-50%	76	72	73	64	72	68	-
Albumin	33-48 g/L	72	66	71	54	59	56	-
PCR	<1.0	60	65	57	52	64	55	-
KT/V	≥ 1.2	95	96	93	98	94	97	-
URR	>65%	94	95	91	97	93	96	92

Hb and Fe in HD

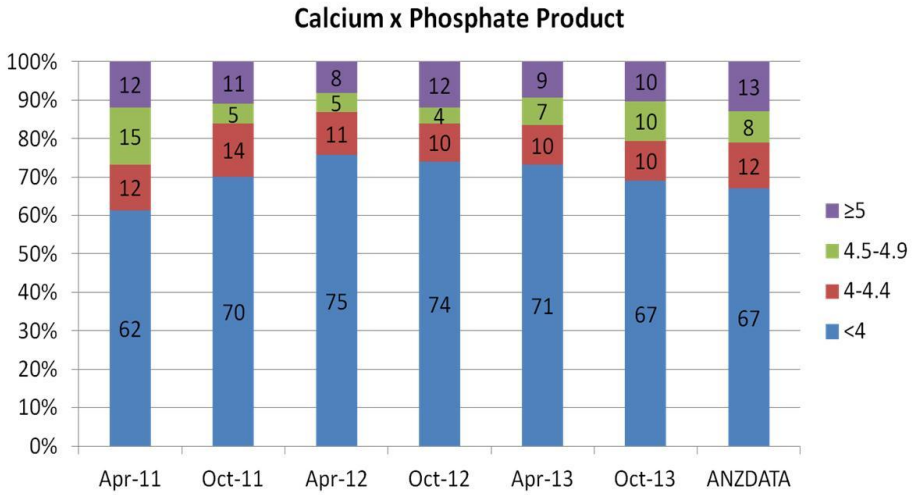


Unclear whether those with Hb >120 were on ESA or not

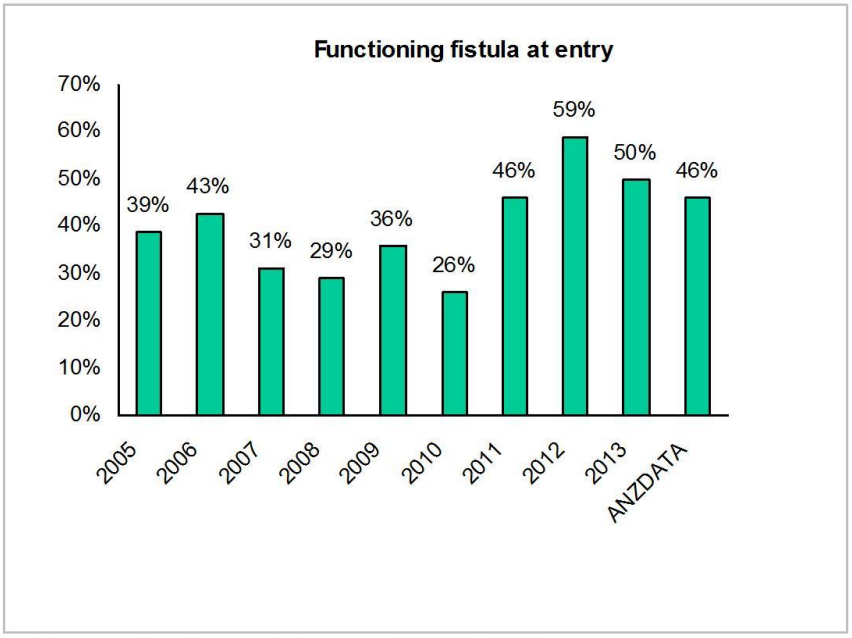


Rate of achieved iron targets is dropping

Ca x Phosphate in HD



1st HD AVF/AVG is above ANZDATA rates

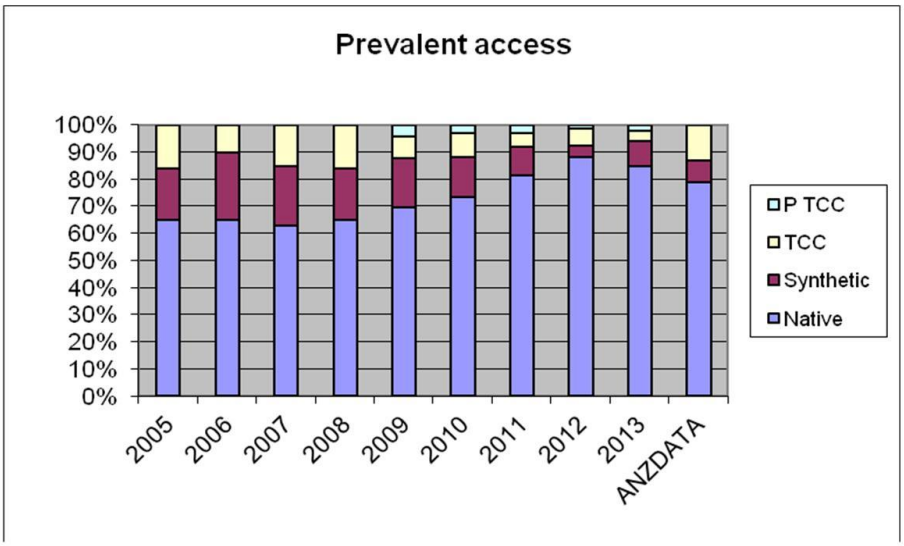


The late referral rate at St George = ANZDATA (22%).

Average time from initial referral to access creation was 56 days. Aim is 30 days

Average time to first cannulation in 2013 was 13 months

Prevalent AVF/AVG (n=192) above ANZDATA rates



2% permanent vascath

Other vascular access meeting targets

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
2013	1 BSI (0-0.15 BSI/100 pt months)	2 BSI (0-2.3 BSI/100 pt months)

BSI for fistulas (0.6%) but grafts (25%) - small number of prevalent patients with grafts

Median survival times:
AVF = > 6.1 years, AVG = > 2.9 years, Flexine = > 6.0 years

Thrombosis rate for St George Hospital is meeting target:
AVF = 0.06 episodes/pt-year
AVG/SVG = 0.19 episodes/pt-year

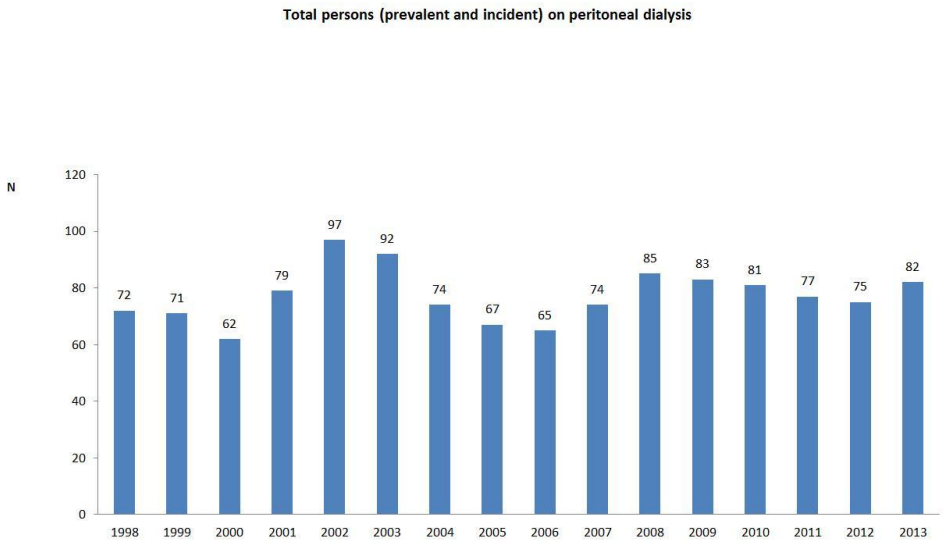
Catheter infection rates:

KDOQI (2006) recommends < 1.5 episodes/1000 catheter days

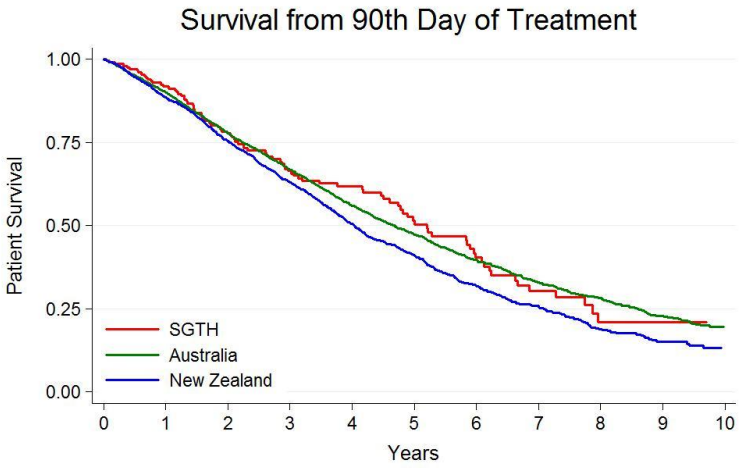
Catheter related bacteraemia (CRB) rate
1.2% (0.23 episodes/1000 catheter days)

Exit site infections (ESI) rate 2013
2.3% (0.45 episodes/1000 catheter days)

PD patients

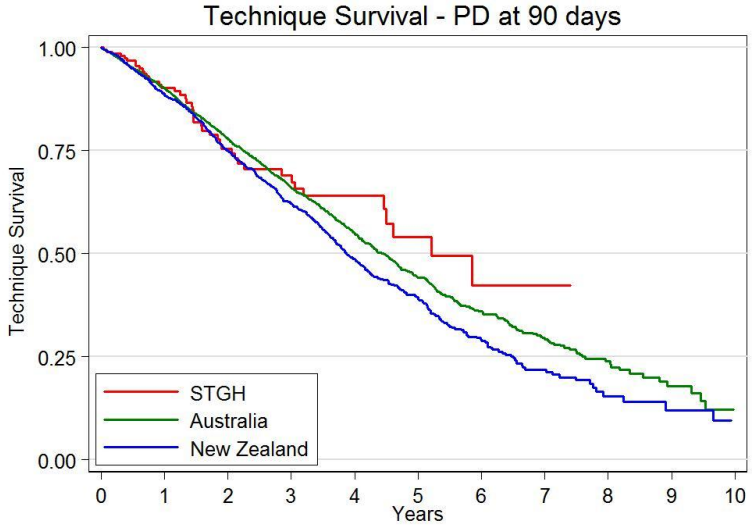


PD patient survival



Peritoneal dialysis was used to treat 25% of all dialysis patients in St George compared to 19% reported on the 35th Annual ANZDATA report (2012).

PD Technique

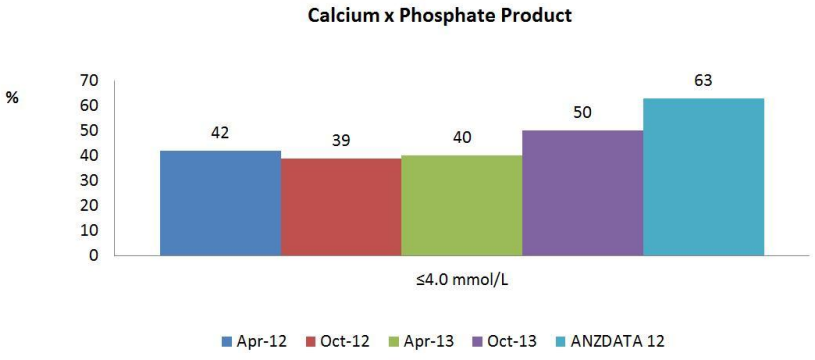


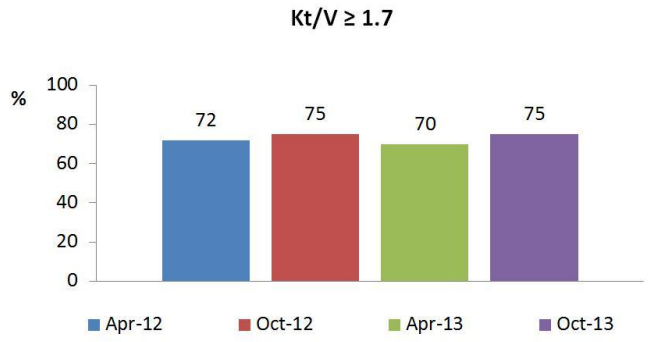
PD blood results

Parameter	Target	Apr 12	Oct 12	Apr 13	Oct 13	ANZDATA 12
Corr Ca	2.1-2.4 mmol/L	32	33	34	50	-
PO4	0.8-1.6 mmol/L	42	36	42	53	45
$CaPO_4$	<4.0 mmol/L	42	39	40	50	63
Ferritin	200-800 ug/L	54	50	59	50	52
Transferrin	20-50%	60	64	70	63	70
Albumin*	33-48 g/L	46	33	44	29	-
PTH	7-45 nmol/L	65	50	67	58	-
KT/V	≥ 1.7	72	75	70	75	-
CCL	>50L (L & LA) or >60L (H & HA)		62	67	77	-

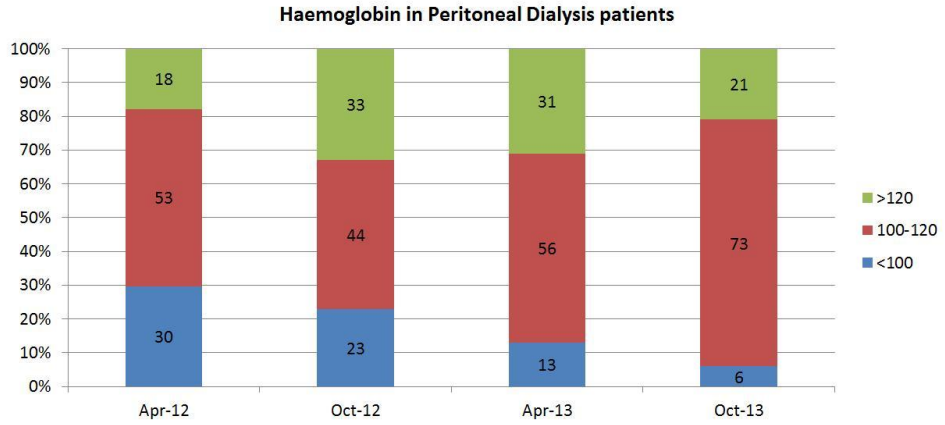
Need targeted dietetics involvement

PD adequacy & Ca Phosphate



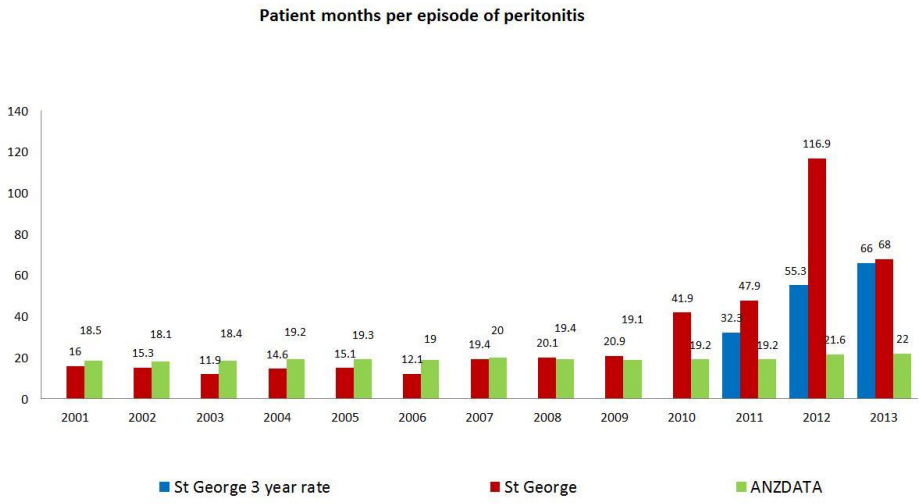


PD - Hb



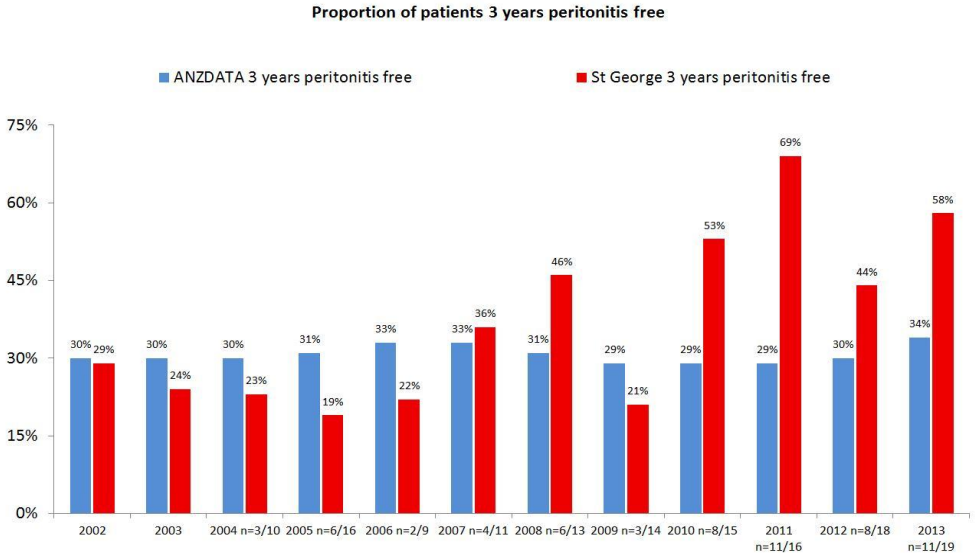
Only half of those with high Hb had their ESA ceased

Peritonitis



3 patients transferred to HD permanently as a result of peritonitis.

Peritonitis



3 patients transferred to HD permanently as a result of peritonitis.

PD summary

- All outcome measures of patient survival, peritonitis and technique survival are as good or better than national outcomes.
- There is room for improvement in improving calcium x phosphate control, iron management and nutrition,

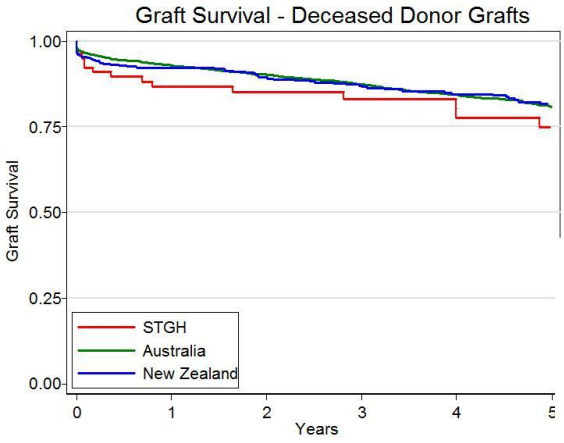
Transplants

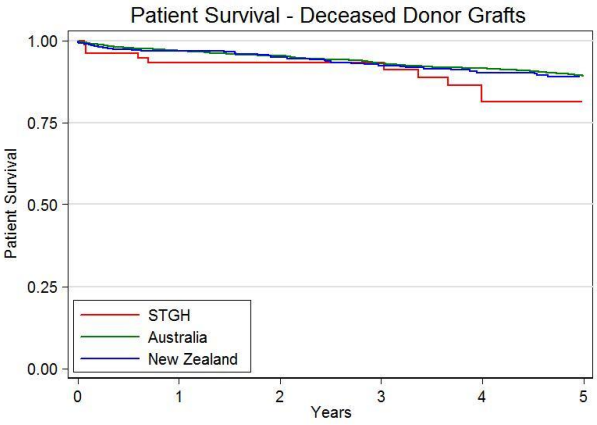
- 20 patients received a kidney transplant, one received a combined kidney liver and one received a combined kidney pancreas.
- 3 patients died with functioning grafts.
- 3 patients had graft failure and returned to dialysis.
  - Overall 3% of the transplant patients lost their graft in 2013

Transplant cohort compared with National

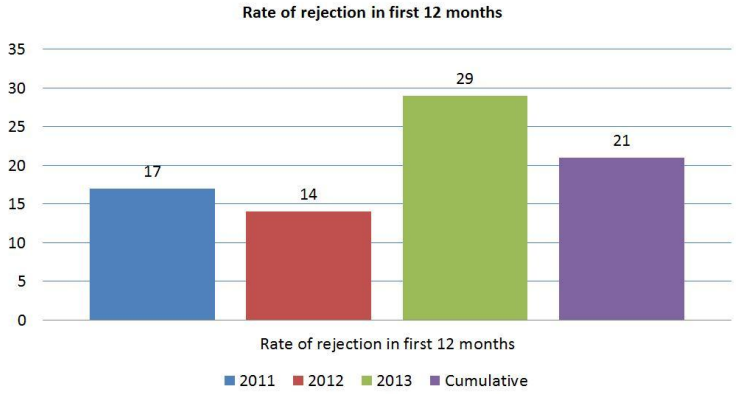
- Recipient age groups and gender are similar; fewer Caucasians at St George (69 vs. 80%) due to a larger Asian population.
- Primary renal disease spectrum is similar
- Slightly longer time on dialysis pre-transplant (85 vs. 76% over 2 years)
- No difference in smoking, co-morbidities (IHD, CLD, CVD, PVD, diabetes)
- Donor age > 60 only slightly higher (29 vs. 24%)
- No difference in HLA mismatches - better for zero mismatch (11 vs. 4%)
- No difference in ischemic times
- **Fewer patients with creatinine <120 at 12 months (34 vs. 41%)**
- **More deaths/graft loss (10 vs. 7%)**

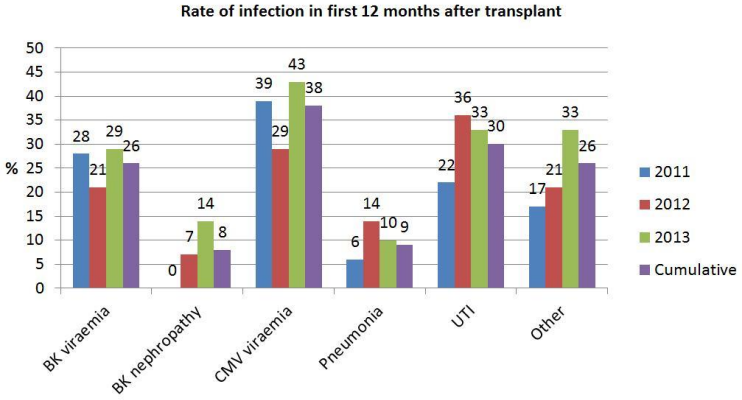
Transplant outcomes

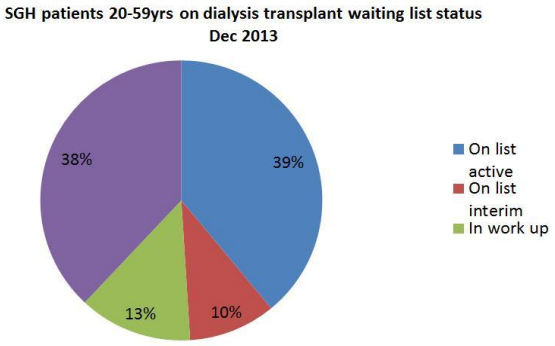




Patients transplanted between Jan 1st 2003 and Dec 31st 2012
(n=124, 3% of the National transplants)



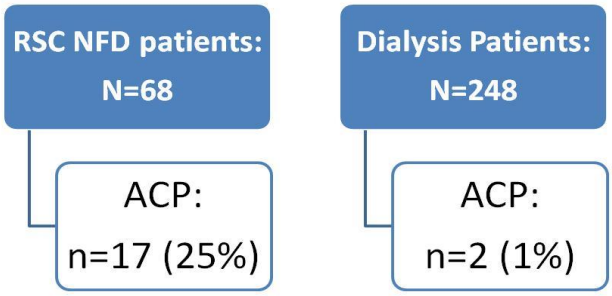




Age group (years)	NOMS list (Australia)	On dialysis (Australia)	% age group on waiting list (Australia)	NOMS list (SGH)	Dialysing (SGH)	% age group on waiting list (SGH)
20-29	74	237	**31%**	2	5	**40%**
30-39	151	580	**26%**	6	11	**55%**
40-49	254	1217	**21%**	13	22	**59%**
50-59	342	1961	**17%**	13	35	**37%**
60-69	289	2465	**12%**	13	55	**24%**
70-79	24	2701	**1%**	0	68	**0%**
80-89	1	1343	**<1%**	0	51	**0%**

Renal Supportive Care

	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

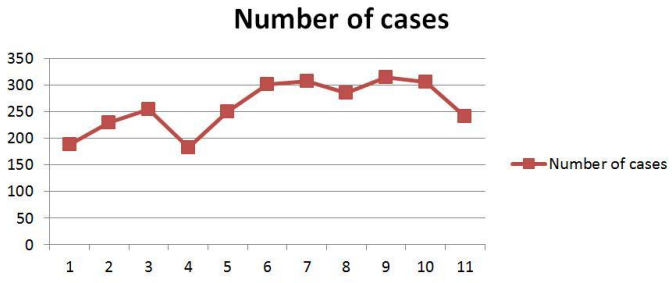


Hypertension

- 13 patients underwent renal denervation and data from these 13 patients will be analysed during 2014 and presented.
- 477 Ambulatory Blood Pressure Monitors

Pregnancy

Trend over past 10 years



No perinatal deaths
No pulmonary edema
No dialysis
High LSCS rates

	N	Severe Htn (%)	Neuro (%)	Anti Con (%)	Eclampsia (%)	Liver (%)	Renal Ceat>90 (%)	Platelets <150 (%)	SGA <10% (%)	NICU (%)	PNM	CS rate (%)	<34/40	<37/40
GH	76	9(12)	2(3)	0	0	2(3)	1(1.5)	5(7)	7(9)	0	0	23(30)	0	11(14)
PE	101	31(31)	17(17)	11(11)	2(2)	25(25)	12(12)	17(17)	20(20)	7(7)	0	56(55)	9(9)	20(20)
EH+PE	6	3(50)	3(50)	1(17)	1(17)	2(34)	2(34)	1(17)	0	0	0	5(83)	2(33)	1(17)
EH	21	1(5)	0	0	0	0	0	1(5)	2(10)	0	0	9(43)	1(5)	2(10)
Renal	9	0	1(11)	0	0	1(11)	4(44)	0	0	0	0	3(33)	1(11)	0
WCH	5	0	0	0	0	0	0	0	0	0	0	3(60)	0	0
Renal+PE	2	0	0	0	0	0	1(50)	1(50)	0	0	0	2(100)	1(50)	1(50)

Renal Biopsy

Year N	2010 N=85	2011 N=109	2012 N=86	2013 N=118	Last 4 years N=398
Total complications	9.4(8)	10(11)	7.2(6)	5.1(6)	7.7(31)
Gross Haematuria, %(n)	4.7(4)	4.6(5)	3.5(3)	3.3(4)	4(16)
Perinephric Haematoma, %(n)	4.7(4)	4.6(5)	3.5(3)	1.7(2)	3.5(14)
Perinephric bleed – angioembolisation, %(n)	0(0)	0(0)	0(0)	0(0)	0(0)
Required blood transfusion	0(0)	1(1)	4.7(4)	0.8(1)	1.5(6)

Our bench marks (Am J Kidney Dis 60(1):62-73. 2012) are:
Macroscopic hematuria 3.5% - **met**
Blood transfusion 1%- **met**
Angio-embolisation 0.6%- **met**

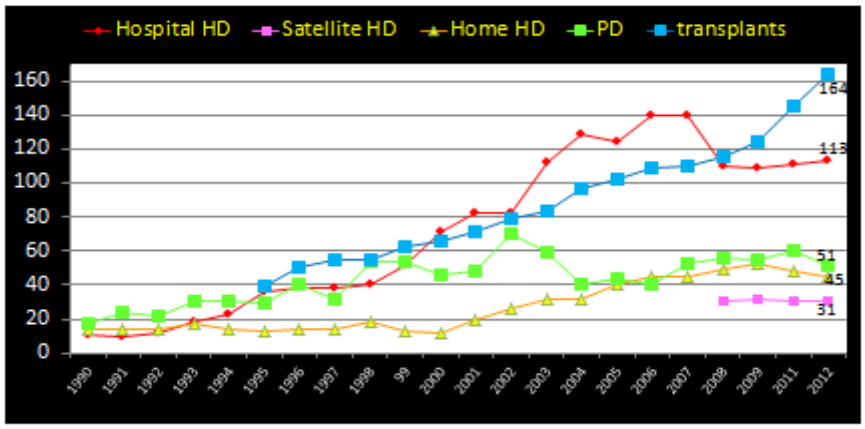
There is no benchmark for symptomatic perinephric haematoma.

Research & Presentations

- Invited Presentations
  - 34 Local
  - 6 National
  - 6 International
- Presentations at Scientific Meetings
  - 1 Local
  - 7 National
  - 1 International
- Peer reviewed Publications
  - 28 Journal papers

2. ACCEPTANCE ONTO DIALYSIS

Dialysis & transplant patients St.George 1990-2012



NB. Hospital HD includes potential satellite patients until 2008

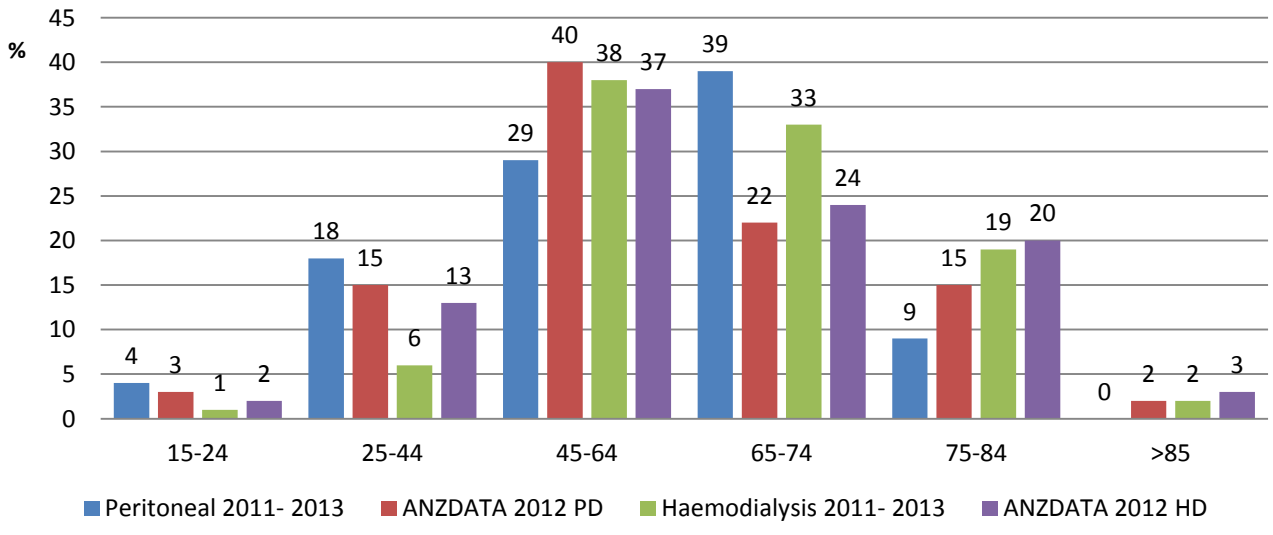
ANZDATA 31/12/12

Out of 59 new patients who started dialysis in 2013, 22 patients commenced peritoneal dialysis and 37 started haemodialysis. Patients are analysed according to their first mode of dialysis only.

- There were 7(12%) late referrals which is below the National average (22%). All late referral patients received haemodialysis with three transferring to PD in 2013.
- Mean age at commencement of PD was 62.8 years in 2013 and for haemodialysis 64.1 years. This was older than 2012 (57 and 62 years respectively).

Age group of new patients

Age Groups of New Patients 2011-2013 compared to ANZDATA 2012 Report

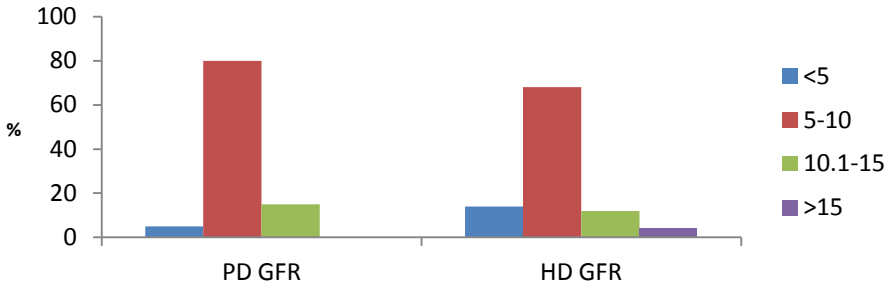


The major finding for acceptance to PD is that we commence fewer patients on PD as their primary modality in the 45-64 age group while we start more patients than nationally in the 65-74 age group. This is a finding to be discussed within the department.

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 2011 -2013



Baseline characteristics of new patients

Body mass index

St George Hospital new patients		PD 2011 – 2013 (%) N=54	ANZDATA 2012 (%)	HD 2011 – 2013 (%) N=90	ANZDATA 2012 (%)
Body Mass Index	<20	5		8	
(kg/m)	20-24	35		24	
	25-30	35		26	
	>30	22	No data	28	36
	>35	2	No data	12	16

According to ANZDATA (2012), 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 Haemodialysis 2011-13 (n=90*)	HD ANZDATA 2011 (n=1811)	St George Peritoneal dialysis 2011-13 (n=54*)	PD ANZDATA 2011 (n=543)
Age	(Average age in years)	64.1	60†	63.3	60†
Gender	Male	61%	60%	71%	56%
	Female	39%	40%	29%	43%
Late Referral	(< 3 months before first treatment)	12%	26%	11%	12%
Co-morbidities	Smoking (Current and former)	49%	54%†	37%	54%†
	Chronic Lung Disease (yes and suspected)	10%	21%	4%	15%
	Cerebrovascular Disease	9%	16%	13%	15%
	Coronary Artery Disease	44%	47%	31%	33%
	Peripheral Vascular Disease	21%	30%	16%	22%
	Diabetes	52%	49%	39%	43%

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

Fewer new patients were obese and there were fewer late referrals than nationally. Our patients commencing dialysis were less likely to be smokers than nationally and their co-morbidity burden was fairly similar with perhaps slightly less lung disease and peripheral vascular disease.

We can conclude from these data that we are accepting patients for dialysis who 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

Aim

To provide data to the department concerning Predialysis Clinic attendances and outcomes compared to previous years that allows ongoing discussion and planning for patients requiring renal replacement therapies.

Overview

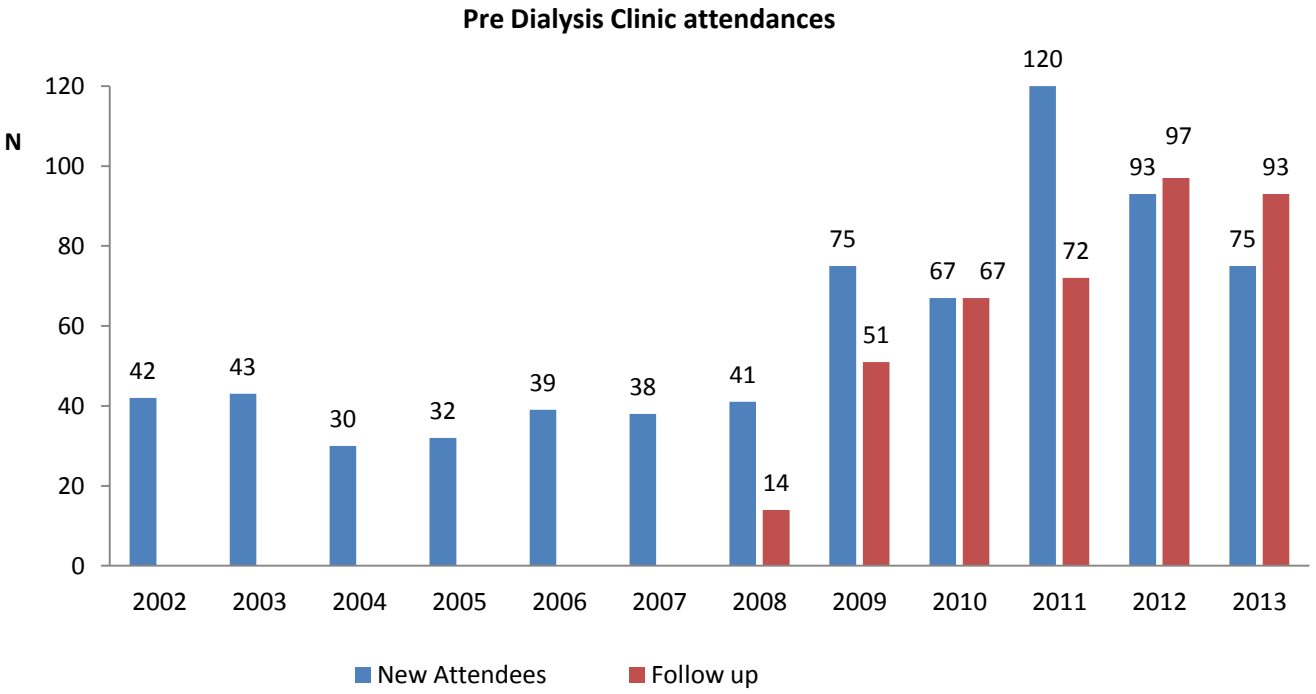
The Renal Department guideline for referral to the multidisciplinary Predialysis Clinic is Creatinine >300umol/L and/or eGFR < 25ml/min. Generally, nephrologists will have considered these patients as suitable for dialysis. As of December 31st 2013, there were 133 patients on the Predialysis Program with an active plan for renal replacement therapy.

The Predialysis Clinic has been operating since April 2002 and in total there have been 695 people who have attended. At the initial clinic visit patients and family are provided with dialysis options education and a comprehensive social and nutritional assessment. Patients return to the clinic for a follow up at 4-6 weeks and then yearly or as required. The patients' progress and outcomes are tracked and initiation of vascular access planning or pre PD assessment conducted when indicated. Patient progress is discussed monthly with all members of the department to assist planning for dialysis.

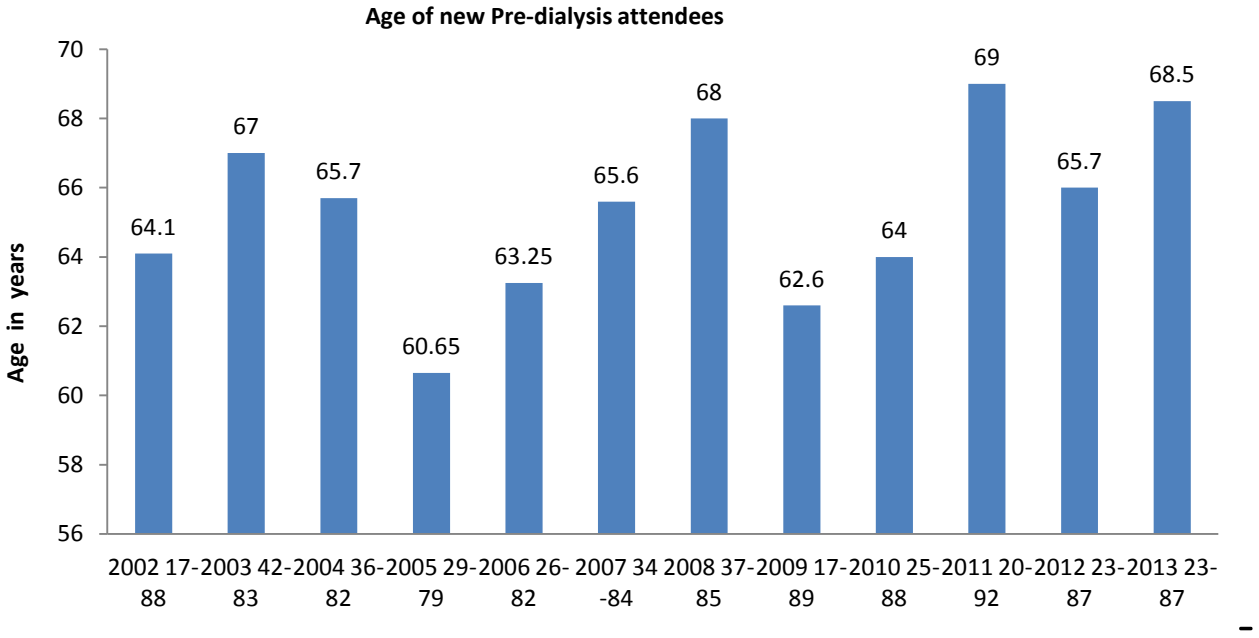
Clinic activity

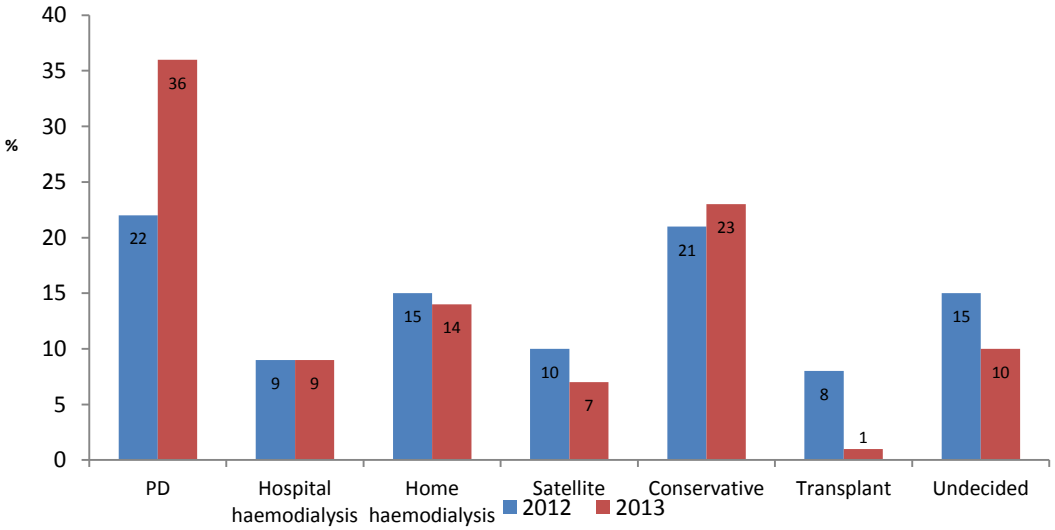
75 new patients attended clinic in 2013 compared to 93 new attendees in 2012. There were 93 follow up appointments compared to 97 follow up appointments in 2012. Clinic Letters and predialysis patient progress spreadsheets continue to be stored electronically for easy access by renal staff. If a patient presents to the Emergency Department and potentially requires urgent dialysis his/her choice of dialysis treatment modality is then known.

New attendees and follow up numbers since inception in 2002 Average age and age range of new



Predialysis Clinic attendees since inception in 2002

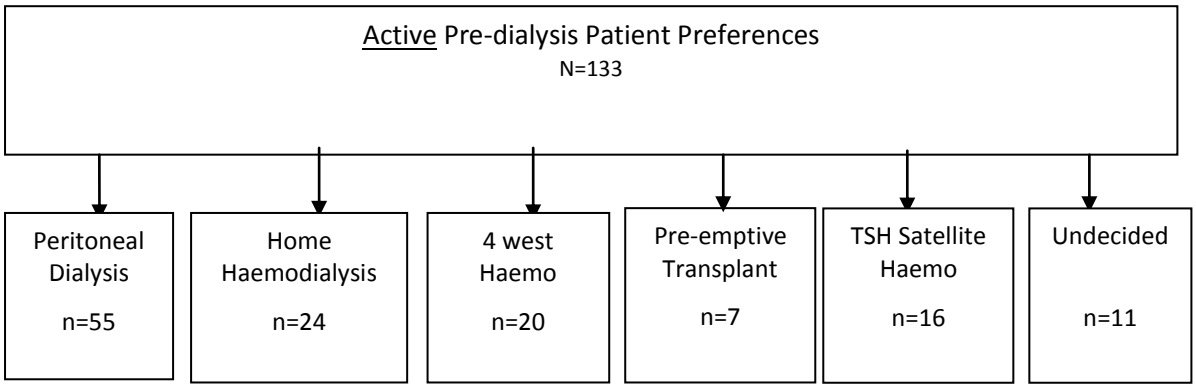




Percent of patients who opt for specific RRT therapies as a result of pre-dialysis education

It is apparent from these data that almost 1 in 4 patients who had been referred to the pre-dialysis clinic with a view to dialysis decide otherwise and proceed down a non-dialysis conservative management pathway. Moreover, for those pursuing dialysis peritoneal dialysis has become the major focus, which permits dialysis at home in an older age group.

Pathways of active Pre-Dialysis patients



It is apparent from these data that there will be increasing pressure on 4 west and TSH satellite haemodialysis areas to cope with this patient load; a new satellite unit in the St George area is still required.

Benchmarking

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

1. **Timely referral to Predialysis Program**
    - 50% eGFR> 20
    - 70% eGFR> 15

eGFR for new patients on referral for pre dialysis education

In 2013, 33% of patients were referred with an eGFR >20 and 80% had an eGFR > 15 which shows an improvement from 2012 in which 23% had an eGFR >20 and 63% had an eGFR >15 on referral for pre dialysis education. The plan is now to determine whether these remain appropriate benchmarks; new referral criteria may account for rate of loss of GFR as well.

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

   - For patients commencing dialysis in 2013 Home haemodialysis starts did not reach the 70% benchmark.
   - Peritoneal dialysis 95% (20/22) – One patient commenced haemodialysis acutely and then transferred when stable.
   - 4 west and satellite haemodialysis 90% (18/20) started 4 west and satellite dialysis.
   - Home haemodialysis 66% (4/6) patients started home haemo. Two patients commenced 4west dialysis and are planned to transfer to home haemodialysis in 2014.
   - 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.**

   - Of the 38 end stage CKD patients who commenced haemodialysis in 2013, 24 (63%) had attended Predialysis Clinic. Of the 22 new peritoneal dialysis patients, 18 (81%) had attended clinic. Of the 4 peritoneal dialysis starts that had not been to Predialysis only one was a late referral. Two although tracked on the predialysis database refused to have follow up appointments.
   - 86% of new dialysis patients (excluding late referrals) had pre-dialysis education ≥ 3 months before dialysis commencement. This result is the same as the previous year.

4. **Hepatitis B vaccination – by commencement of RRT 50% of patients attending the Pre-dialysis Clinic will have completed a course of hepatitis B vaccinations.**

   - 70% of patients who had been through the Predialysis Clinic and commenced dialysis in 2013 had completed a course of hepatitis B vaccinations.
   - In the next report the benchmark will change to 60% starting dialysis with HbsAb positive rather than the % vaccinated

Summary of Benchmarking

1. Improvements in all benchmarks in 2013.
2. Three of the four benchmarks were met. The department will discuss the relevance and setting of these benchmarks for 2014.

3. HAEMODIALYSIS REPORT (2013)

Summary and Data report prepared by: Tracey Blow, 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 116 patients were dialysed each month and a total of 18,889 treatments completed, a 5.0% increase from 2012.

The Satellite haemodialysis service at The Sutherland Hospital operates nine chairs for low care patients. In 2013, 5590 treatments were performed, a 10% increase from the previous year following the opening of one chair, and on average 37 patients were dialysed each month.

Home haemodialysis training commenced for 11 patients during 2013, 7 patients completed training, 2 failed and there were 2 patients in training as of December 31st. Respite dialysis continued to be a well utilised service with 191 treatments provided and ten patients received a transplant in 2013.

Activity for haemodialysis

Activity increased across the two sites in 2013 with a total of 24,479 sessions performed (in-centre and satellite treatments). The graph below shows growth patterns from 2002 with a 15% increase in 2013.This includes haemodialysis for both acute and chronic kidney disease.

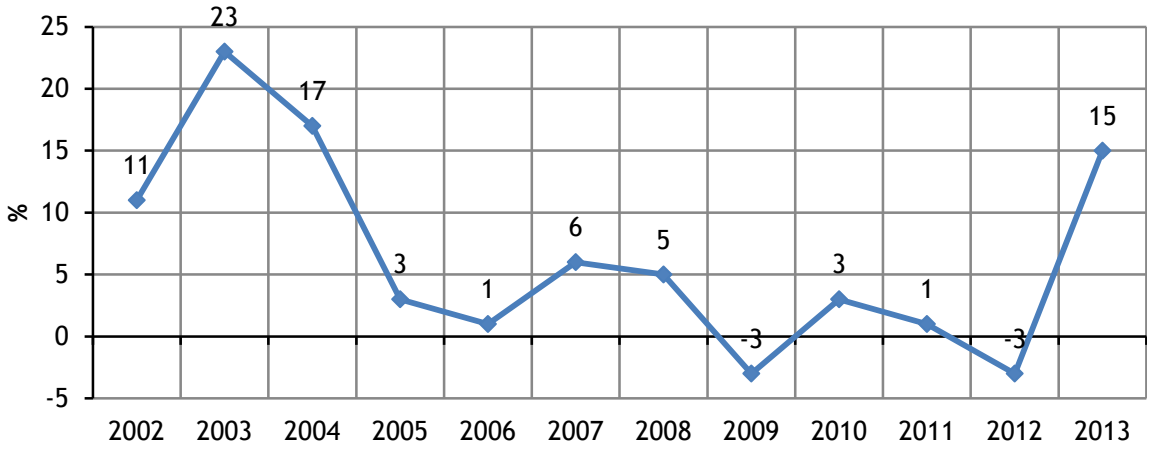


Figure 1. Growth Rates in Haemodialysis at St George and Sutherland Dialysis Units

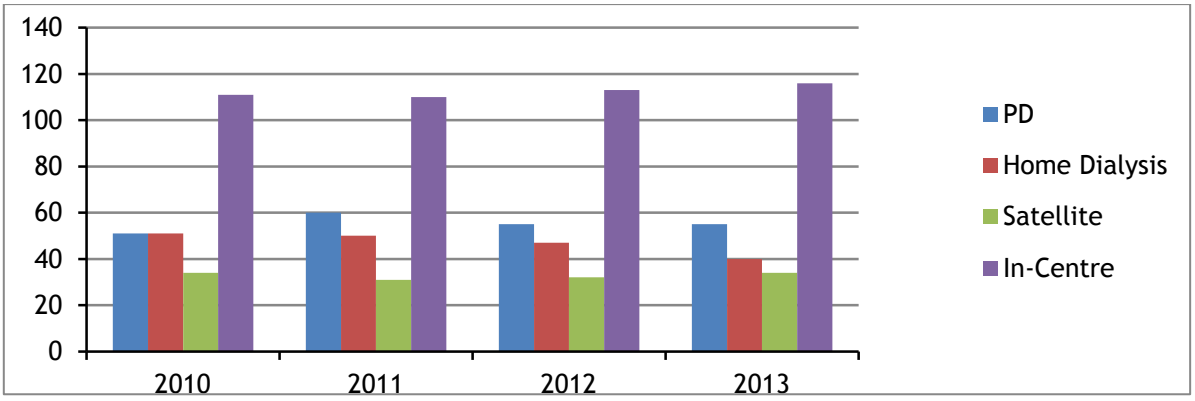


Figure 2. Table 1: Distributions of dialysis modalities for 2010 through to 2013

Table 1. Patient Flow at St George Hospital from and to haemodialysis for 2013

In-centre haemodialysis patients at beginning of year		2009	2010	2011	2012	2013
N value		109	108	111	110	118
In 1)	New Patients	32	35	26	22	36
2)	Transfers from other units	7	1	1	2	1
3)	Transfers from PD	1	8	2	7	10
4)	Failed transplants	7	13	11	4	4
5)	Transfers from Home Hdx/Satellite	0	2	2	0	7
6)	Acutes					19
Subtotal		***47***	***57***	***42***	***35***	***77***
Out						
8)	Transplants	2	4	5	7	4
9)	Transfers to other units/overseas	6	2	2	2	2
10)	Transfers to Home Hdx	7	7	4	2	4
12)	Transfers to PD	6	12	2	3	4
13)	Transfers to Satellite	6	7	8	6	15
14)	Regain Function	2	3	0	0	15
15)	Deaths (medical)	15	11	19	8	19
16)	Deaths (withdrawal)	10	14	5	7	16
Subtotal		***54***	***60***	***45***	***35***	***79***
Net Gain		-1	2	-1	-	-2
In-centre haemodialysis patients at end of year		101	117	110	118	116

Table 2. Patient Flow at The Sutherland Hospital from and to haemodialysis for 2013

Satellite haemodialysis patients at beginning of year		2009	2010	2011	2012	2013
		34	33	34	33	34
In a)	New Patients	1	1	1	1	1
b)	Transfers from other units	1	3	1	1	0
c)	Transfer from PD	0	1	0	0	0
d)	Transfer from In centre	6	7	8	14	8
Subtotal		***8***	***12***	***10***	***16***	***9***
Out e)	Transplants	0	2	3	1	1
f)	Transfers to Home Hdx	1	1	1	0	1
g)	Transfers to PD	1	1	0	0	2
h)	Transfers to In centre	6	3	0	1	3
i)	Transfer to other units	1	0	0	0	0
J)	Deaths (medical)	0	2	2	5	4
K)	Deaths (withdrawal)	0	1	2	2	1
l)	Regain Function		1	0	0	0
Subtotal		***9***	***11***	***8***	***9***	***12***
Net Gain		-1	0	2	7	-3
Satellite haemodialysis patients at end of year		33	34	31	35	39

Patient numbers remained stable in the unit for 2013 at St George Hospital. We saw a higher number than compared with our last two years of new haemodialysis patients. This was accounted for by a higher than normal flow from our home peritoneal dialysis and haemodialysis program. There was no clear clinical reason for this occurrence. This was balanced out by a slightly higher number of deaths and more patients being transferred to the satellite unit in Sutherland. Despite this movement our home haemodialysis numbers remain above the national average.

At The Sutherland hospital satellite dialysis unit had a slightly higher number of patients compared to our baseline. This was accounted for by an effort to move more patients to a satellite unit.

There remains a concerted effort to move patients to satellite dialysis where possible, to open more chairs at Sutherland and to develop a new stand-alone satellite haemodialysis unit for the St George Hospital area patients.

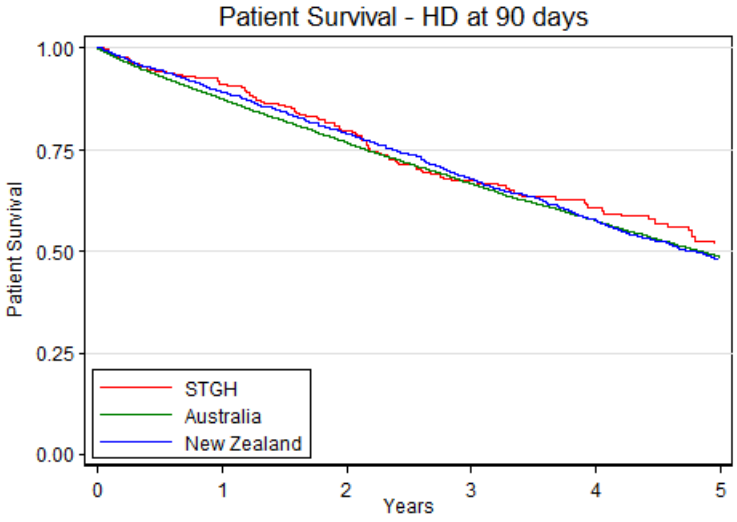
Table 3. Flow to and from Home Haemodialysis from 2009 to 2013

Home haemodialysis patients at beginning of year		2009	2010	2011	2012	2013
		50	54	51	48	47
In	New Patients	3	1	3	4	3
	Transfer from PD	0	0	0	0	0
	Transfers from other units		0	1	1	0
	Transfer from Satellite	1		1	0	0
	Failed transplants	0	1	0	0	0
	New Transfer from In centre Hdx	4	6	5	3	4
	In training at the end of the year	1		1	1	2
Subtotal		***8***	***8***	***11***	***8***	***9***
Out	Transplants	8	1	7	7	10
	Transfers to other units	2	1	0	1	1
	Transfers to In centre Hdx	1	4	0	0	2
	Transfers to Satellite	0	0	1	0	0
	Deaths	0	4	4	1	3
Subtotal		***11***	***10***	***12***	***9***	***16***
Net Gain/Loss		4	-3	-1	-2	-7
Home haemodialysis patients at end of year		54	51	50	47	40

Summary:

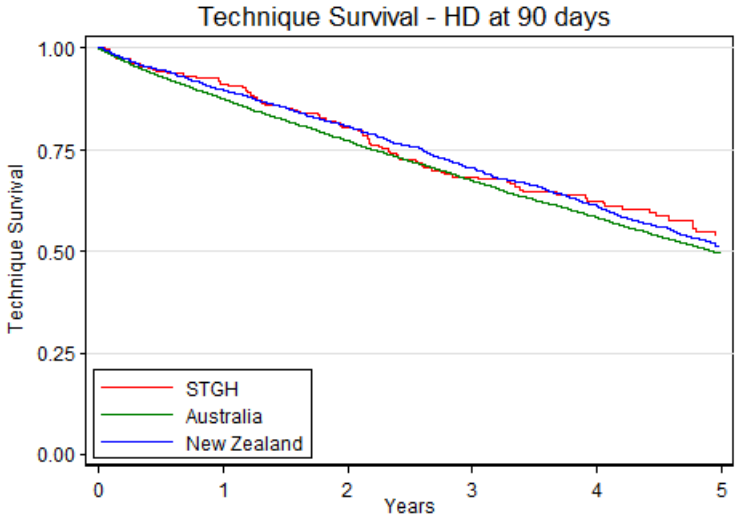
- Activity increased throughout 2013 with an overall growth of 15% across the sites.
- On the 31st December 2013, 34 (14%) StG patients were dialysing at the satellite unit.
- Thirty eight percent (38 %) of St George patients are dialysing on a home therapy (PD and HD) compared to 27% nationally. However, this proportion has decreased from prior years, due to increased transplantation rates in the home HD population.
- Home haemodialysis respite remained a valuable service in 2013 and is an area for service growth in coming years. A system review is required to ensure adequate staffing is provided for home haemodialysis in 2014 to facilitate additional patient training.

- High cut off therapy for patients with cast nephropathy from multiple myeloma (MM) continued to be a treatment option for a small group of patients suffering from MM. Future study of the effectiveness of this treatment is required to determine the benefits. The target of this treatment is to keep patients off dialysis for >6months.



Data are for 301 patients dialysed from 2003 to Dec 31st 2012.
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 52%. This is for our cohort which is slightly older than the national average.

1 year	233	91.1 (87.1-93.9)	10455	87.5 (86.9-88.0)
5 years	57	51.7 (43.9-58.9)	2315	48.7 (47.5-49.8)



Dialysis technique survival continued to remain slightly better than the national average, being 91% at one year and 54% at 5 years.

1 year	224	91.2 (87.2-94.0)	9729	87.5 (86.9-88.0)
5 years	55	53.8 (45.8-61.1)	2131	49.4 (48.2-50.6)

Haemodialysis Clinical, Biochemical and Dialysis Adequacy Evaluation

As part of the dialysis units ongoing evaluation to ensure adequate dialysis was achieved for the patients it was standard practice to carry out routine monthly blood testing. Such protocols remain standardised throughout Australia. It is the aim to achieve specific biochemical and haematological targets. To achieve these, a specific 'dialysis dose' is prescribed for each individual patient in order to achieve an accepted 'uraemic toxin' clearance and this is measured with specific tools such as a Kt/v and uraemia reduction ratio (URR) equations.

Achieving the correct dialysis dose, assessing their diet and general well-being is also measured using these standardised biochemical and haematological targets. Some of the markers are achieved through choosing the correct dialyser, dialysis time and dialysis machine settings and others are achieved through diet, lifestyle factors and through multiple medical therapies. An example is that of iron infusion and erythropoietin stimulating agent (ESA) use to achieve a target haemoglobin level. Achieving these targets for patients on dialysis is termed 'dialysis adequacy'. Many targets are used and achieving these targets or KPIs serves as a measure of how our dialysis unit delivers an acceptable standard of healthcare for patients with end stage kidney failure (ESKD).

- 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
- In other instances data are evaluated against the existing national and international guidelines e.g. CARI guidelines, KDOQI

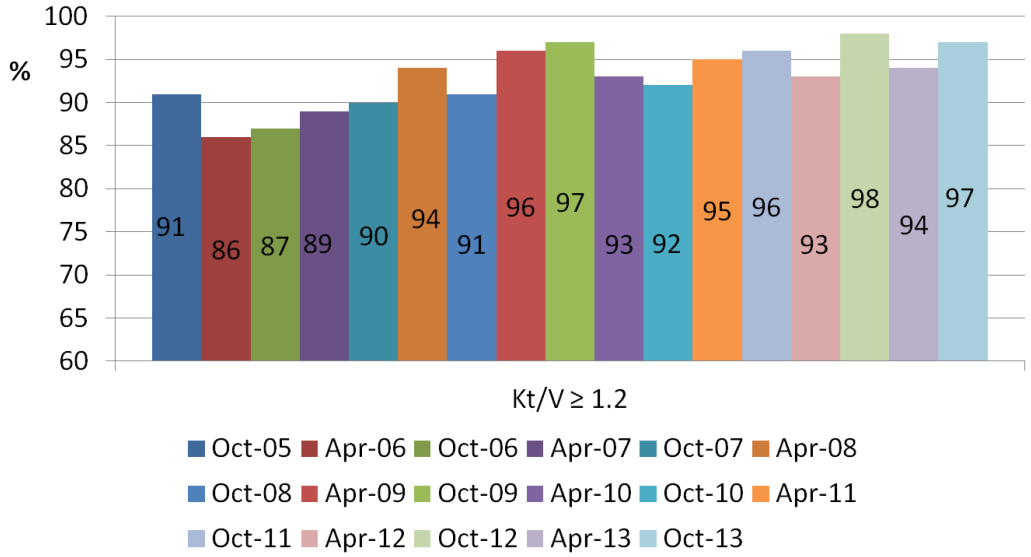


Figure 3. Dialysis Adequacy assessed by Kt/v from 2005 to 2012

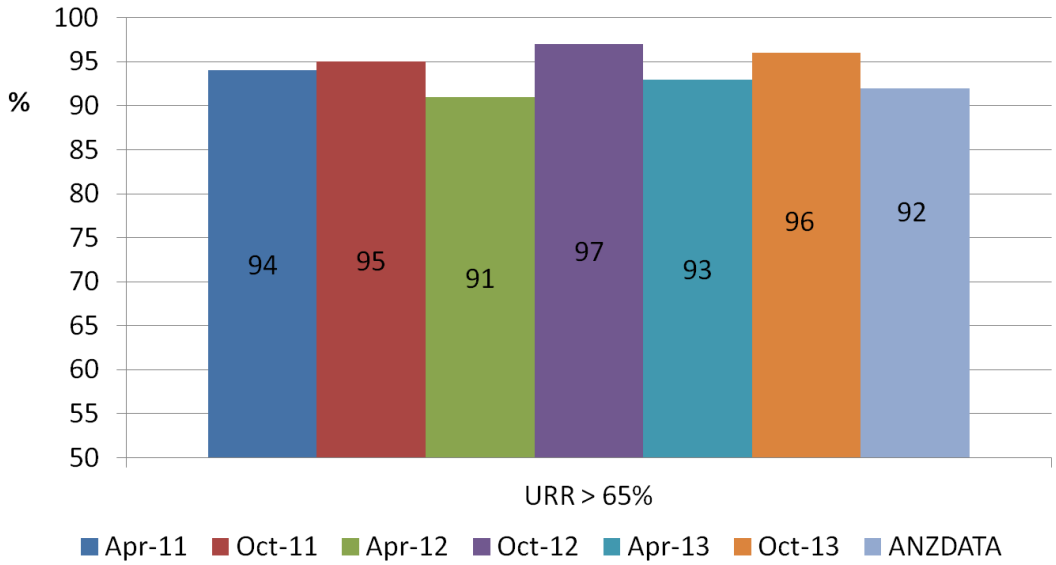


Figure 4. Urea Reduction Ratio (URR) >65% in patients on Haemodialysis by Year

The St George dialysis unit has consistently achieved targets at or better than national or international standards which is in keeping with our overall patient outcomes. Out outcomes are slightly better than the national averages. Again data demonstrates our rates remain similar to national data where URR rates from ANZDATA were 92%.

Table 4. Blood biochemical targets and percentage of patients achieving target levels

Parameter	Target	Apr 11	Oct 11	Apr 12	Oct 12	Apr 13	Oct 13	ANZDATA 12
Ca	2.25-2.58 mmol/L	65	59	64	51	60	57	-
Corr Ca	2.1-2.4 mol/L	31	40	42	54	49	40	-
PO4	0.8-1.6 mmol/L	55	62	64	65	62	61	-
$CaPO_4$	<4.0 mmol/L	62	70	74	70	71	67	67
Ferritin	200-800 ug/L	72	74	75	67	76	69	60
Fe Sats	20-50%	76	72	73	64	72	68	-
Albumin	33-48 g/L	72	66	71	54	59	56	-
PCR	<1.0	60	65	57	52	64	55	-
KT/V	≥ 1.2	95	96	93	98	94	97	-
URR	>65%	94	95	91	97	93	96	92

Haemoglobin Targets
The current haemoglobin (Hb) range is now set at 100 to 120 g/dL. Haemoglobin, iron stores and ESA dosing for patients with CKD will be maintained at optimal levels to provide for an improved quality of life and a decrease in adverse symptoms.

Apr 13: Mean 117, SD 11.7, min 90, max 142 ANZDATA 2012 Mean 112
Oct 13: Mean 115, SD 11.1, min 84, max 138

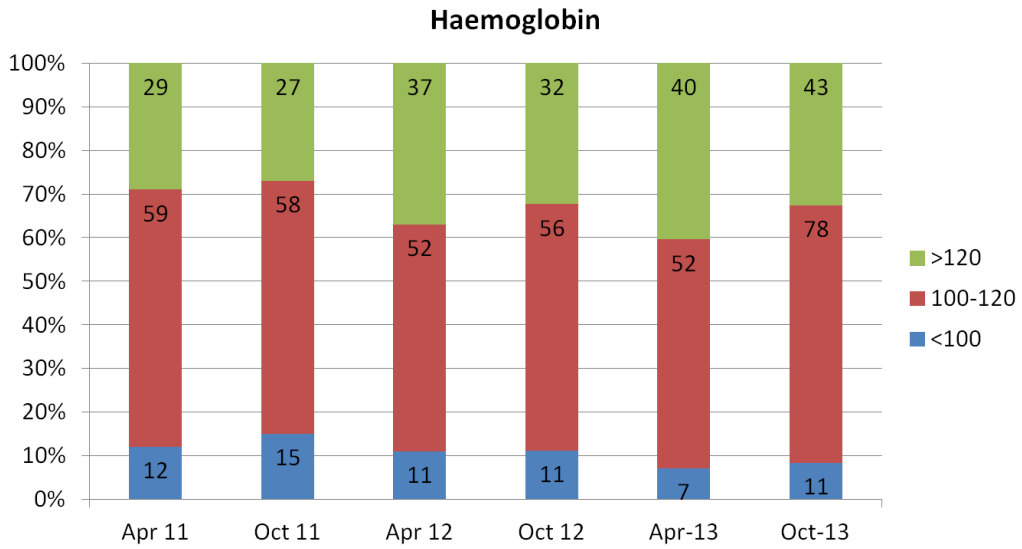


Figure 5. Serum Haemoglobin levels categorised by target level

Overall we continue to keep the majority of our patients within the target range. Importantly very few are at levels below 100mg/dL at which patients may become symptomatic or where quality of life may be impacted upon. The Australian CARI 2011 guideline target for Hb is 100-115g/L. Use of an ESA is suggested when levels drop <95g/L. Levels become potentially dangerous and associated with morbidity and mortality when Hb >130. Keeping the range 100-120 allows for a buffer to ensure levels are clinically safe.

Our mean Hb amongst our dialysis pts was similar to ANZDATA 2012; 112mg/dL vs. 115mg/dL at St George and Sutherland.

Anaemia Management Erythropoietin Use and Serum Iron Studies and

The management of anaemia for patients with end stage kidney disease (ESKD) continues to remain largely the responsibility of the dialysis nurse in our unit with the nephrologist determining ESA dose and being responsible for the prescription. In particular we have nurse led initiation and management of intravenous iron for patients on haemodialysis. The program was commenced over 10 years ago and has resulted in excellent success. We continue to achieve targets above the national ANZDATA targets.

A total of 155 patients were audited for use of erythropoietin use. Sixty four percent (64%; n=100) of patients were receiving an erythropoietin stimulating agent (ESA) at the time of the second audit in October 2013. Fifteen percent (15%; n=24) were having their ESA withheld as their Hb was above target i.e. >120mg/dL. Six percent (6%;n=9) were not on an ESA and no data was available for a further 14.% (n=22). 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.

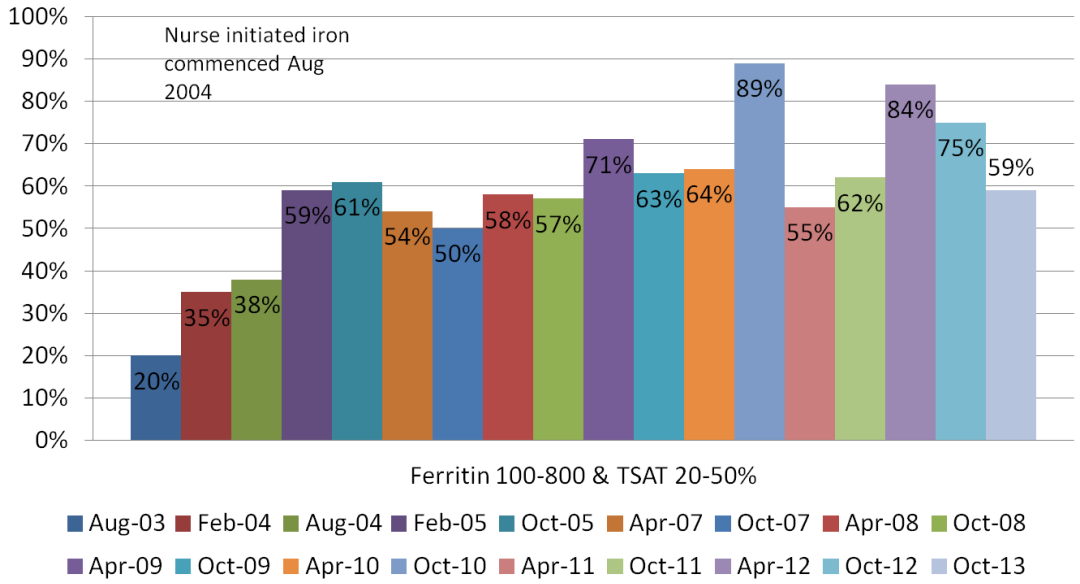


Figure 6. Serum Iron Studies – Serum Ferritin and Transferrin Saturation Levels

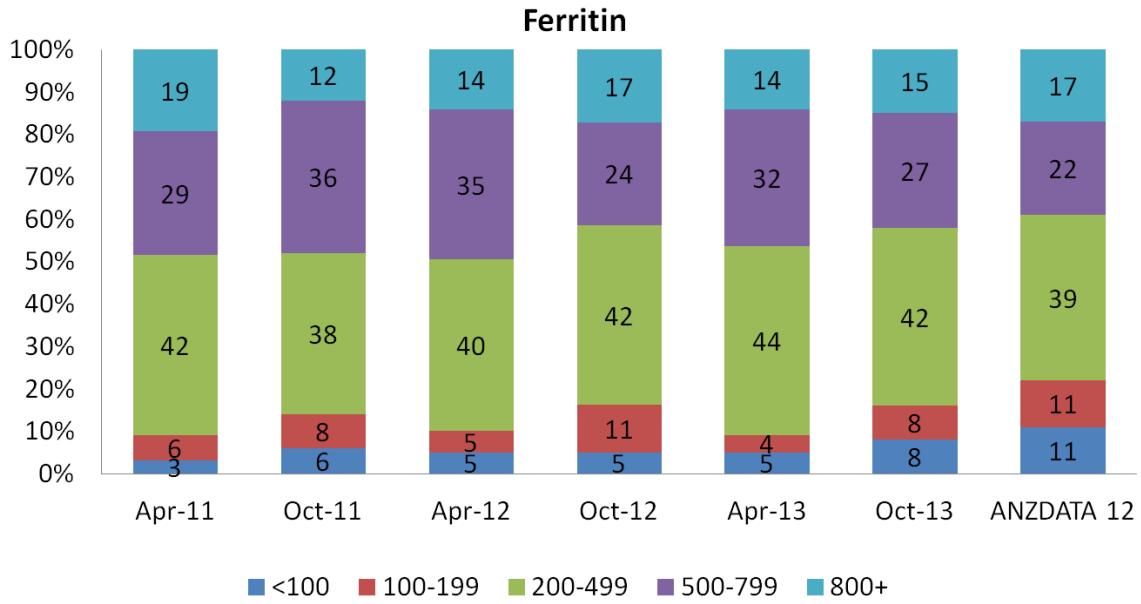


Figure 7. Serum Ferritin levels by target level

Apr 2013: Median 476, CI 434, 610, min 63, max 1200
Oct 2013: Median 427, CI 330, 916, min 51, max 7611

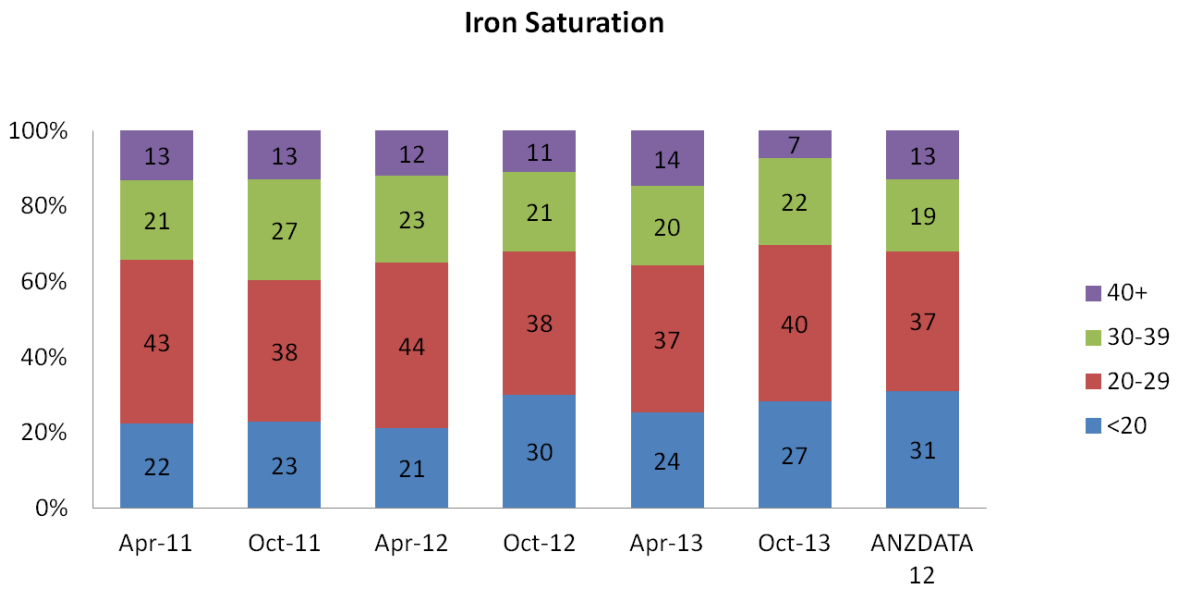


Figure 8. Serum Iron Saturation by target Level

Apr 2013: Median 24, CI 23, 33; min 0.28, max 84
Oct 2012: Median 25, CI 23, 32; min 1.7, max 98

The St George haemodialysis results continue to achieve levels at or slightly better than the national ANZDATA averages for dialysis patients.

RENAL BONE MINERAL METABOLISM MANAGEMENT

Patients on dialysis commonly have abnormalities of PTH secretion, among the causes of which are disturbed regulation of serum phosphate, calcium, calcitriol, bone morphogenic protein-7 and the use of medications that include calcium and aluminium-based phosphate binders and active vitamin D. Levels of PTH have a major influence on bone turnover and mineral metabolism and our patients on dialysis have regular PTH measurements to assess.
For PTH monitoring to provide the maximum benefit to patients, therapeutic targets are necessary. Higher levels of serum calcium, phosphate and the calcium x phosphate product have been associated with coronary artery calcification and increased morbidity and mortality.

Importantly only a very small number of our patients have iPTH levels at those associated with increased mortality i.e. levels >7x normal or >52-95pmol/L or < 3.5 pmol/L. It was noted that a larger number (53%) than previously were <20pmol/L but only 11/131 or 8.3% were <3.5.

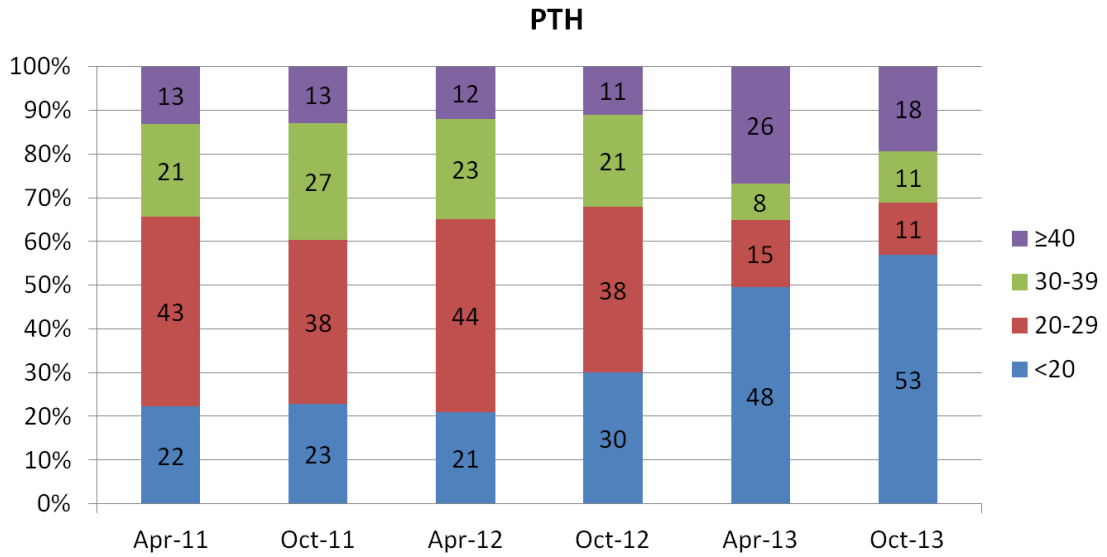


Figure 9. Serum PTH for Haemodialysis patients from 2011 to 2013

Table 5. Mean and Median value for iPTH (pmol/L)

n	131	(cases excluded: 24 due to missing values)			
Mean	29.1557		Median	18.7000	
95% CI	21.9327	to 36.3787	96.4% CI	14.8000	to 24.1000
SE	3.65096				

Interestingly there is a large variation in serum calcium levels through the year. The target levels were lower for October but higher in April compared with ANZDA levels. However, when averaging out the two audits we achieved 57.5% within the target level which is close to the national ANZDATA level. There were more patients at lower levels i.e. serum Ca<2.2mmol/L, possibly indicating the more aggressive focus to achieve lower serum calcium or calcium phosphate products.

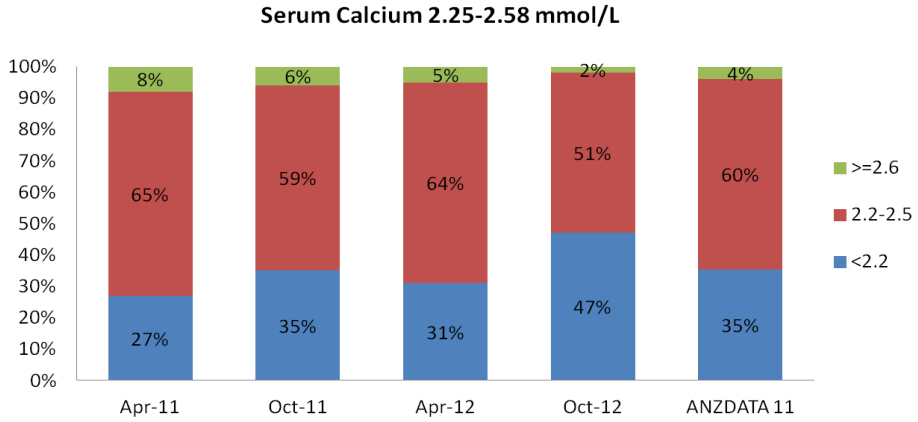


Figure 10. Serum Calcium target levels 2011 to 2012 versus ANZDATA
Apr 2012: Median 2.3, CI 2.28, 2.34; min 1.9, max 2.7
Oct 2012: Median 2.3, CI 2.22, 2.28; min 1.6, max 2.8

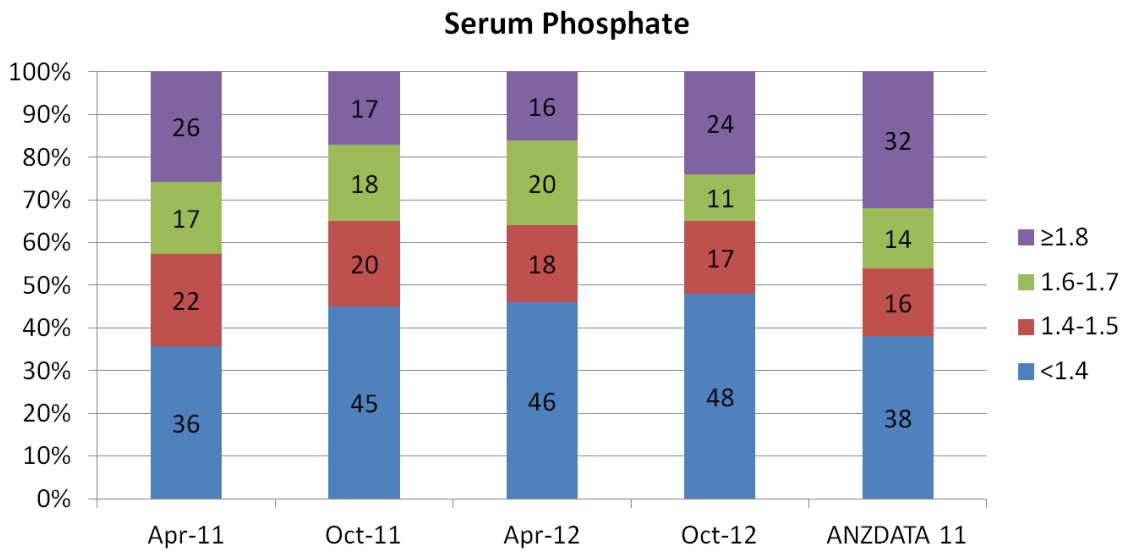


Figure 11. Serum Phosphate target levels from 2011 to 2012 versus ANZDATA
Apr 2012: Median 1.43, CI 1.4, 1.6; min .6, max 4.3
Oct 2012: Median 1.44, CI 1.4, 1.6; min .4, max 4

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

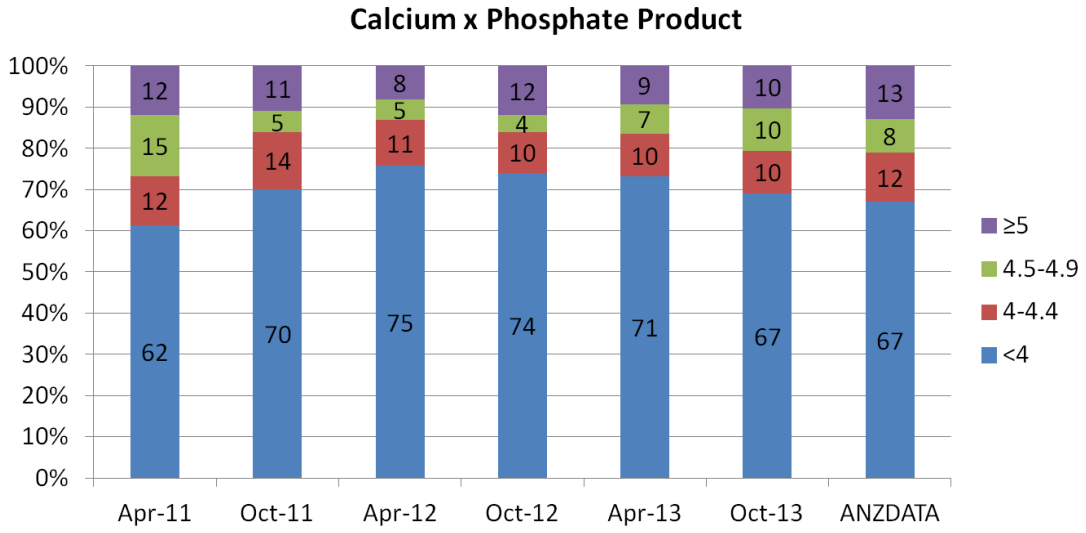


Figure 12. Calcium Phosphate Produced by year and compared to ANZDATA

It is important to recognise and this is acknowledged in the Australian CARI guidelines that ideal targets for bone mineral metabolism parameters are unlikely to be met with conventional dialysis methods and available phosphate binders in the majority of patients.

It is unclear whether using high doses of phosphate binders, using the newer phosphate binders and/or whether performing longer dialysis to improve the bone mineral metabolism status of patients will translate into improvement in the mortality of patients with chronic kidney disease.

Blood Lipid Targets

The most recent KDIGO guidelines have suggested that in adults with dialysis-dependent CKD or ESKD that statins or statin/ezetimibe combination should not be initiated. A few systematic reviews pooling data from all available randomized trials suggest that despite the exceedingly high cardiovascular risk in dialysis patients, it is uncertain whether statin regimens lead to clinical benefit in this population. However, clinicians might reasonably choose statin treatment if they are interested in a relatively small, uncertain reduction in cardiovascular events. Other factors that might influence a patient's decision to receive statin could include recent MI or greater life expectancy (both favouring treatment), and more severe comorbidity or higher current pill burden (both favouring non-treatment).

In light of these new recommendations we present our findings of lipid levels for our dialysis patients. Data are collected only on patients with, or suspected of being high risk or having, coronary artery disease, peripheral vascular disease, cerebrovascular disease or diabetes. In our group of dialysis patients target levels for lipid levels have remained relatively stable and there are no statistically significant changes over this time period in any of the lipid results.

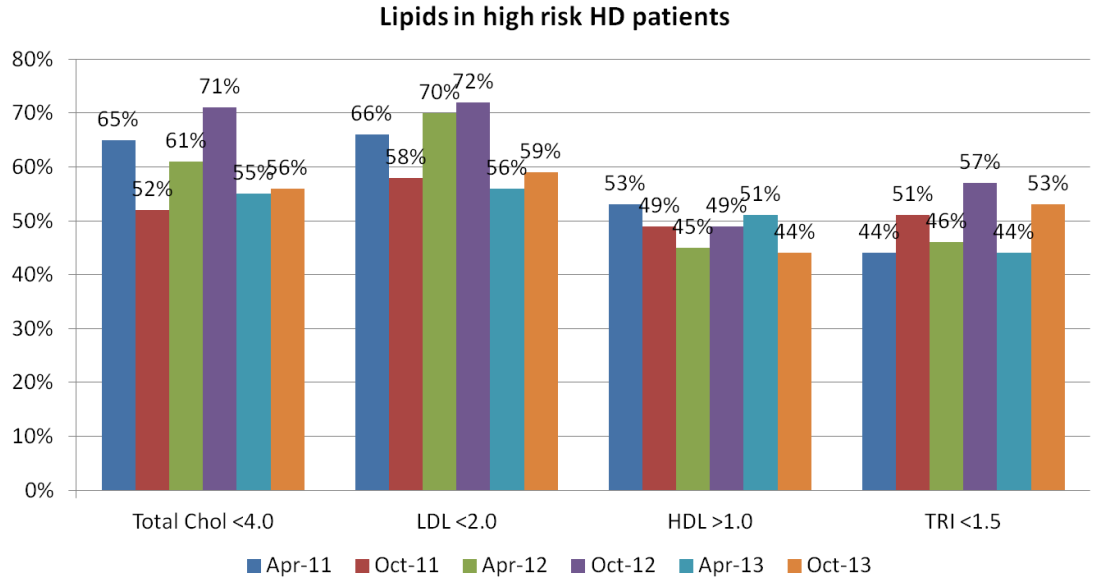


Figure 13. Lipid levels for high risk Haemodialysis patients

Diabetes Control measured by HbA1c

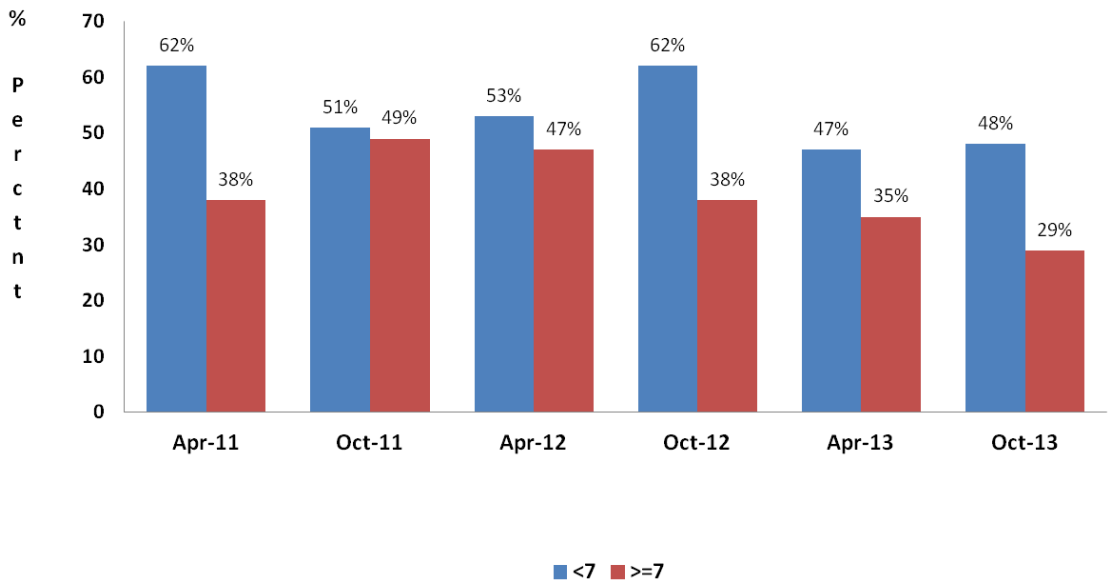


Figure 14. HbA1c for Diabetes patients on Haemodialysis

Data on glucose control was collected on all haemodialysis patients with diabetes (n=73/137) in the October 2012 audit. There is no statistically significant change compared to the previous audits. Twenty nine percent had control which could considered inadequate as HbA1c was >7%. However, the role of HbA1c to assess control on dialysis remains controversial. Nearly half of the patients are having adequate control.

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:

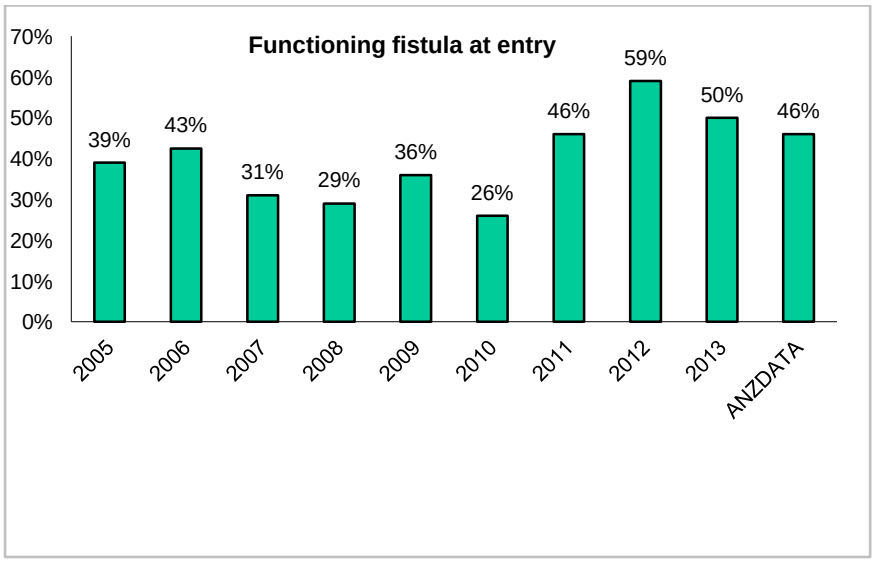
- Data is benchmarked against ANZDATA 2012 report, KDOQI 2006 and CARI 2012 guidelines.

- The key performance measures for vascular access are:

1. > 46% patients commencing haemodialysis with a functioning access (ANZDATA 2012)
2. > 79% of prevalent patients dialysing through a native fistula (ANZDATA 2012)
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)

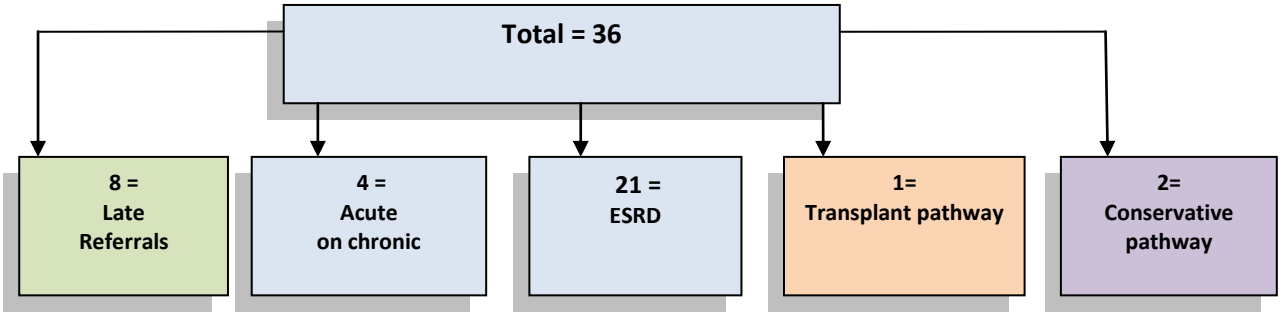
Vascular Access at Commencement of Haemodialysis:

The national average was 46% for patients having a functioning access at first dialysis (ANZDATA 2012).

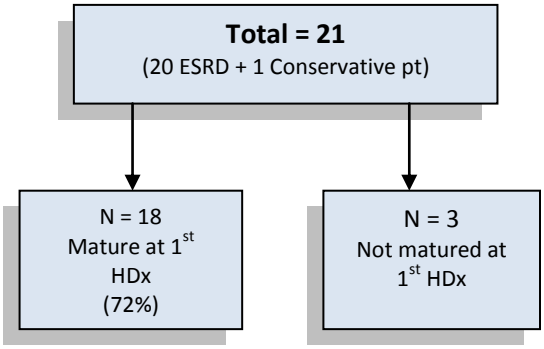


- **In comparison, 50% patients had a functioning access at first dialysis**

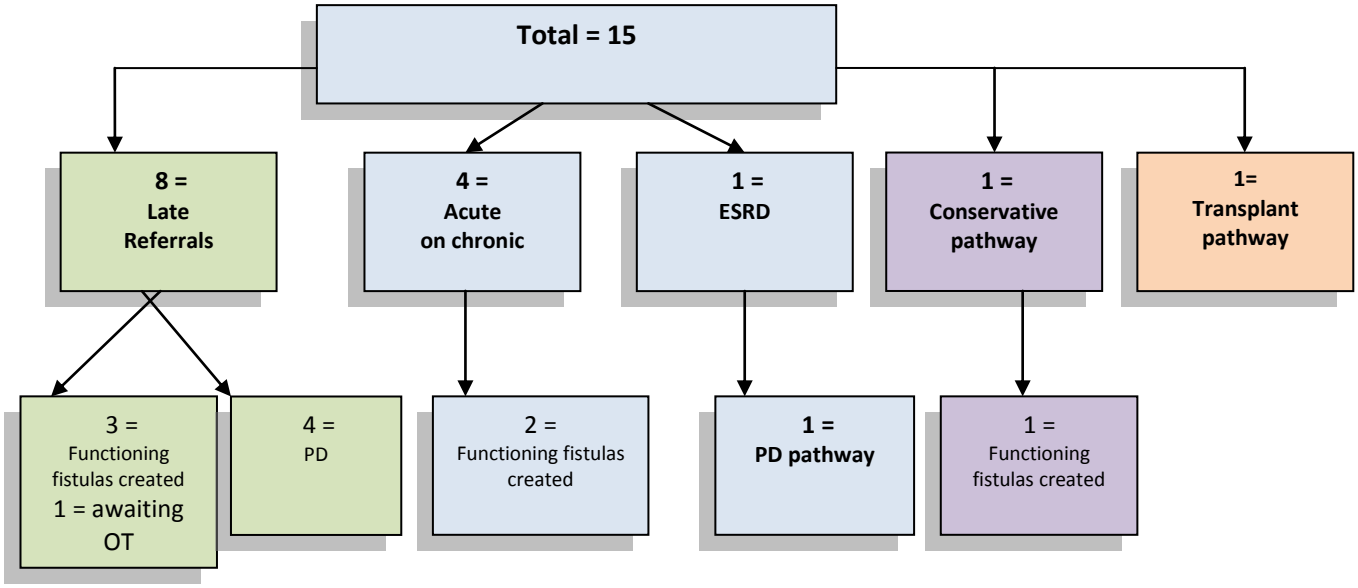
Patients new to haemodialysis in 2013:



Access created before 1st haemodialysis:



No access created before 1st haemodialysis:



Comments:

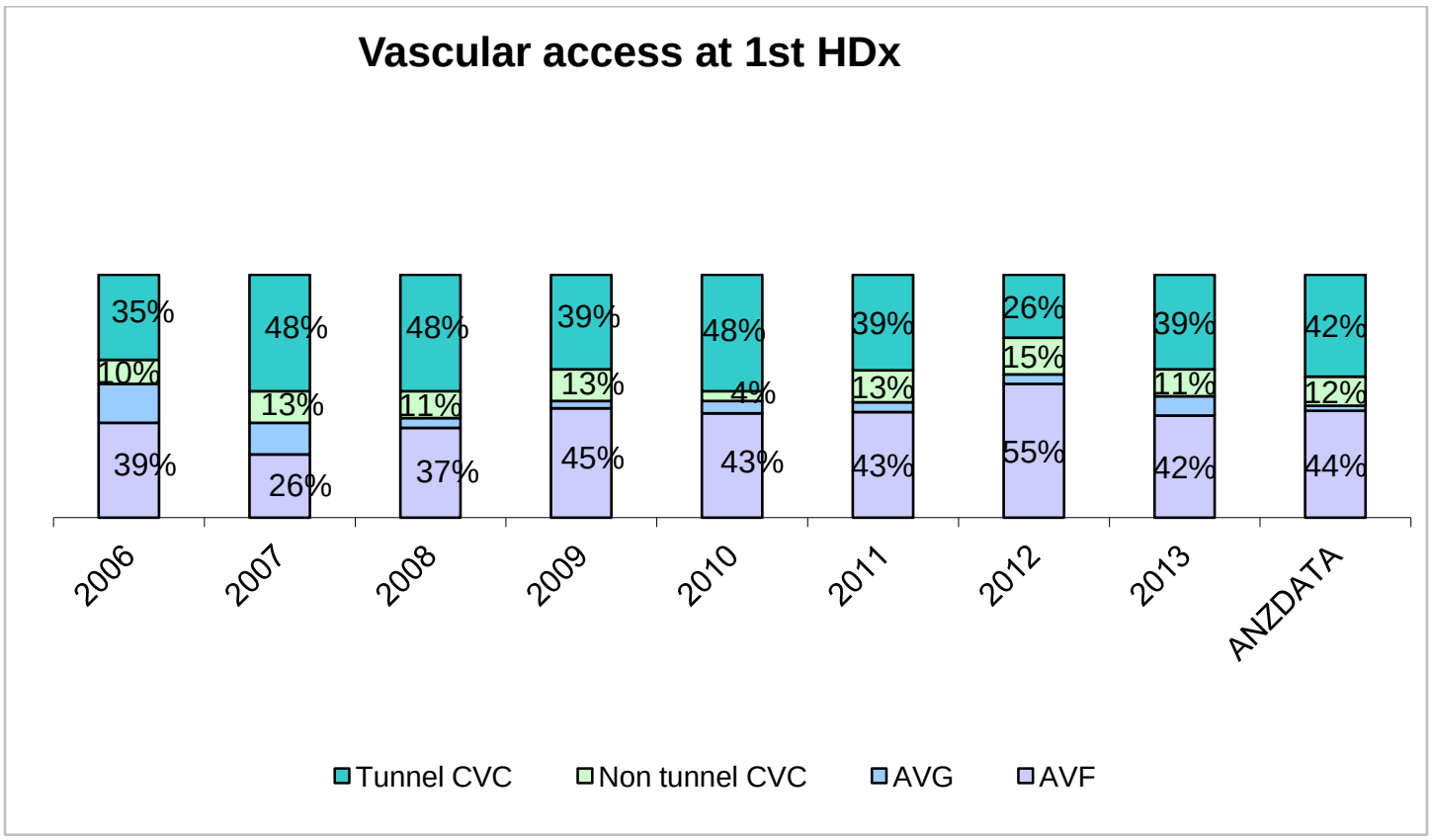
- 18/28 (64%) patients had a mature access at their first haemodialysis **(excluding late referrals) compared to 56% in the ANZDATA report.**

Identified strengths and weakness:

- The late referral rate at St George was the same as the ANZDATA report (22%).
- Average time from initial referral to access creation was 56 days. Aim to have access created within 30 days
- Average time to first cannulation in 2013 was 13 months

Vascular Access at 1st HDx:

ANZDATA (2012) benchmark: 44% commenced with a native fistula (AVF) and 2% with a graft (AVG) equating to 46%



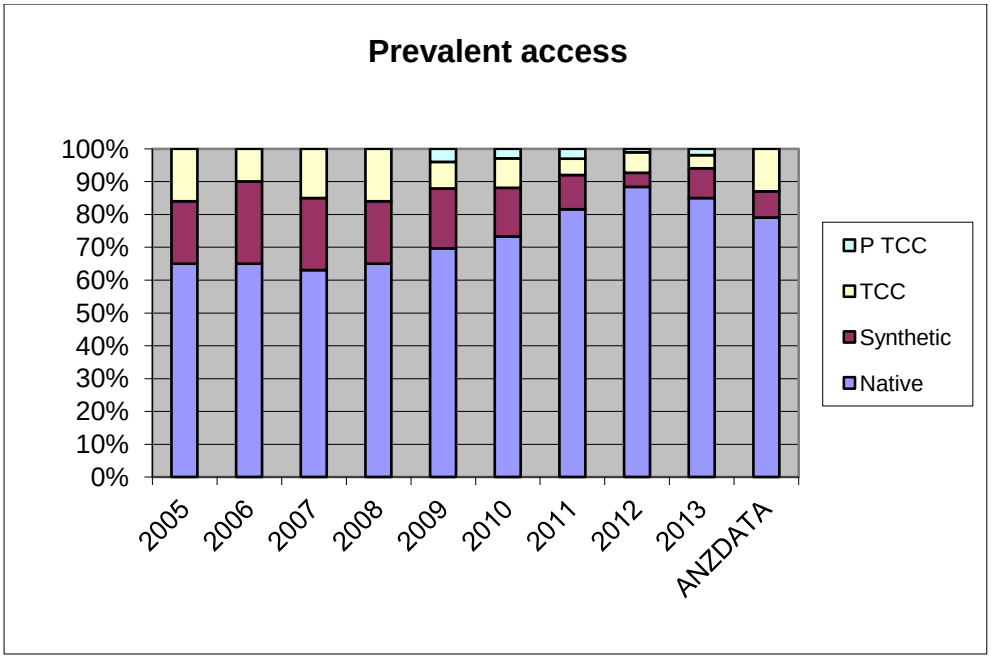
Comments:

- In comparison, St George Hospital Renal Dept achieved 42% with a native fistula and 8% with a graft totalling 50%, surpassing the benchmark of 46%

Access type:

- KDOQI (2006) recommends fistula use in 40% of prevalent patients
- ANZDATA set a benchmark of 79% for fistula use (ANZDATA 2012)
- KDOQI (2006) suggest < 10% of patients have a permanent catheter
- ANZDATA set a benchmark of 13% for tunnelled catheter use (ANZDATA 2012)

Prevalent Data: (n = 192)



Comments:

- 85% of St George patients were using a fistula for haemodialysis surpassing the ANZDATA benchmark of 79% and KDOQI of 40%
- 2% of St George patients were using a permanent catheter which is less than the KDOQI benchmark of < 10%
- A total of 6% 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

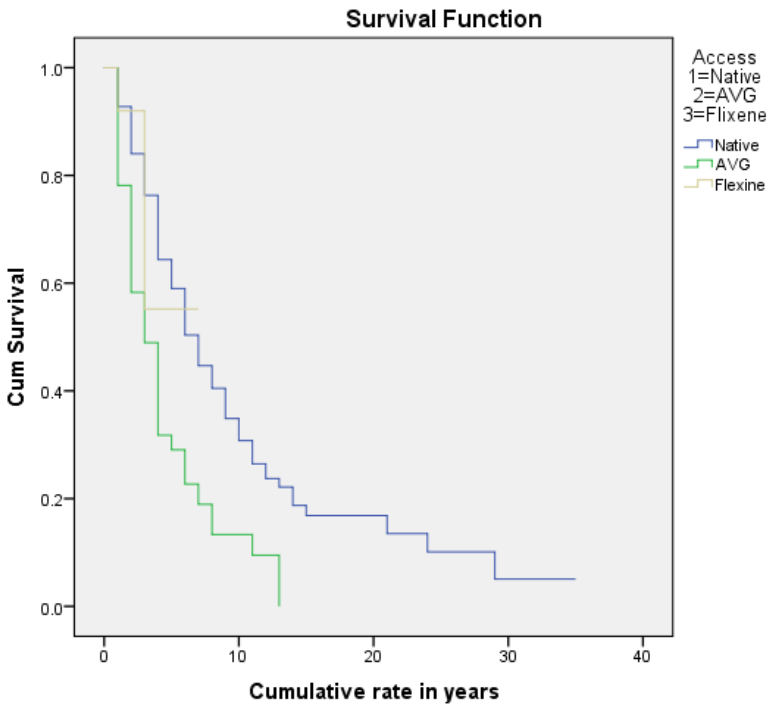
	Blood stream infection (BSI) range AVF/SVG	Blood stream infection (BSI) range AVG
2013	**1 BSI (0-0.15 BSI/100 pt months)**	**2 BSI (0-2.3 BSI/100 pt months)**
2012	1 BSI (0-0.07 BSI/100 pt months)	1 BSI (0-0.59/100 pt months)
2011	2 BSI (0-0.53 BSI/100 pt months)	4 BSI (0-4.5 BSI/100 pt months)
2010	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 patients meet KDOQI benchmark infection rate for fistulas (0.6%) but exceed for grafts (25%) due to the small amount of prevalent patients with grafts insitu

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, 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

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
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:

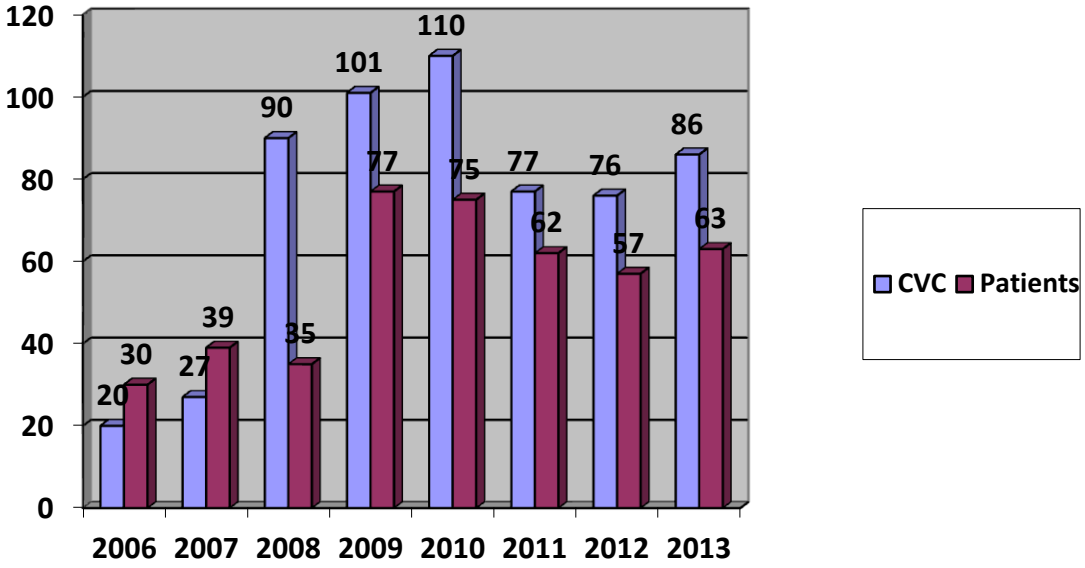
- **Thrombosis rate for St George Hospital is meeting target:**
    - **AVF = 0.06 episodes/pt-year**
    - **AVG/SVG = 0.19 episodes/pt-year**
- Average 1.67 thromboses per month across all fistula types

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)

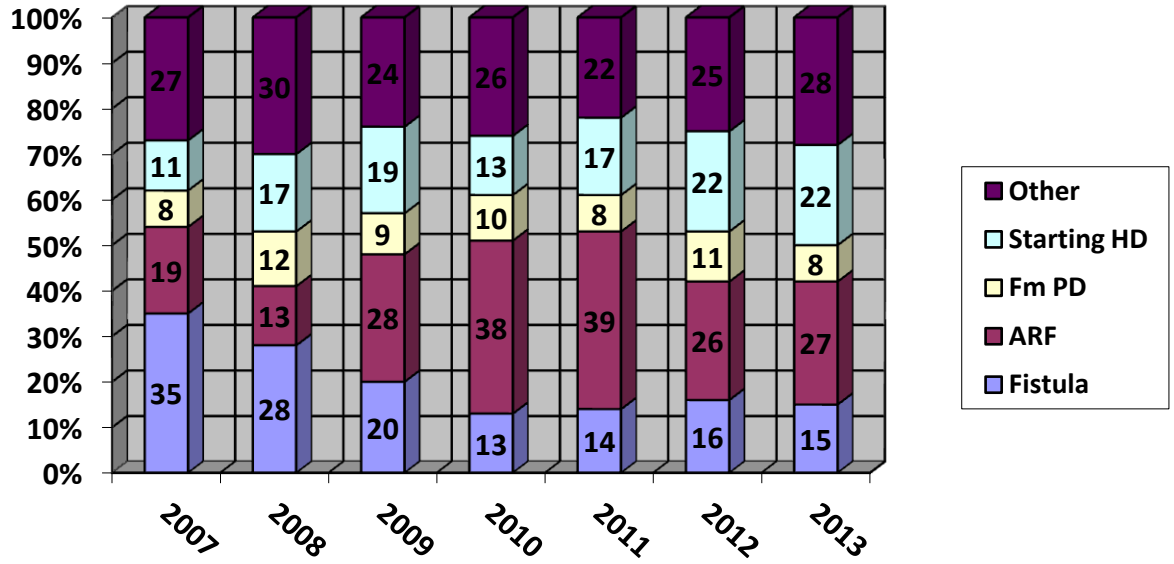
Activity Level:



Comments:

- Total days all catheters in situ = 4404 days (2013) compared to 4232 days (2012)
- 29% of catheters placed in chronic patients in 2013 as compared to 25% in 2012

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 3% of catheter complications related to insertion
- Average days in situ = 51 (2013), compared to 46 (2012) and 94 days (2011)

Catheter infection rates:

KDOQI (2006) recommends < 1.5 episodes/1000 catheter days

	Catheter related bacteraemia (CRB) rate	Exit site infections (ESI) rate
2013	**1.2% (0.23 episodes/1000 catheter days)**	**2.3% (0.45 episodes/1000 catheter days)**
2012	3.9% (0.71 episodes/1000 catheter days)	6.5% (1.18 episodes/1000 catheter days)
2011	1% (0.13 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 is being easily met (CRB 0.23 and ESI 0.45 respectively)
- For 2013, 1 catheter-related and 2 exit-site infections for a total of 86 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)
- Potential for emergence of antimicrobial resistance (CARI, 2012) – random gentamicin levels of 0.4 to 0.8 mg/L indicates toxicity is unlikely

Future plans:

- Vascular Access Clinic will continue
- 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
- New project for 2014: Vascular access learning package and evaluating the Vascular Access clinic through patient satisfaction surveys

5. PERITONEAL DIALYSIS

Aim

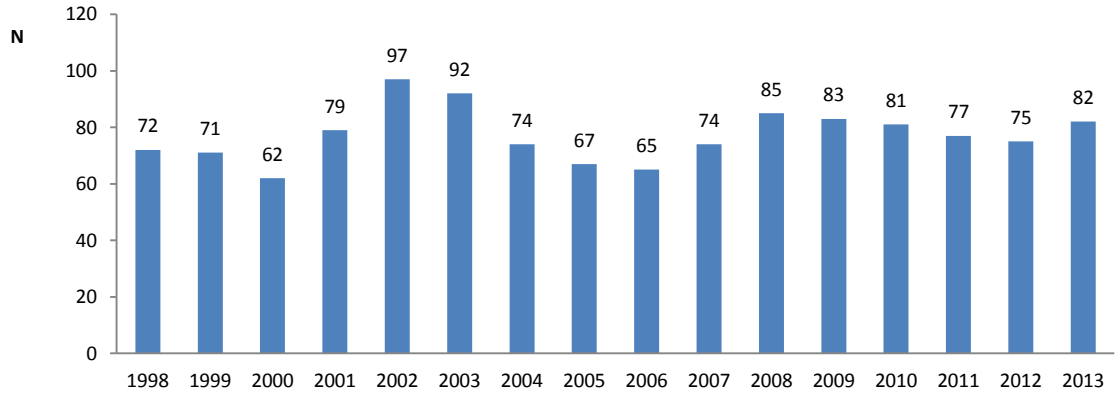
The aim of this report is to provide data on patient outcome indicators of patients on peritoneal dialysis in 2013 i.e. dialysis adequacy, biochemistry and haematology, patient and technique survival and infection rates. ANZDATA results, CARI and KDOQI guidelines are the benchmark used for comparison with St George results. For outcomes without set benchmark, results are compared to previous years' audit. This report is also used to identify improvement in clinical practice.

Activity

Peritoneal dialysis was used to treat 25% of all dialysis patients in St George compared to 19% reported on the 35th Annual ANZDATA report (2012).

A total of 82 patients were treated on PD during 2013 (including hospital IPD) compared to 75 in 2012. In December 2013 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%. This has been a deliberate strategy to enhance the appeal of PD for our patients thereby increasing the number of home patients.

Total persons (prevalent and incident) on peritoneal dialysis



APD	*ANZDATA 62% (1283/2069)*	*St George 95% (61/64)*
CAPD	*ANZDATA 38% (786/2069)*	*St George 5% (3/64)*

PD Patient Flow

Peritoneal dialysis patients as at 31.12.2012 (n=55)

In			
	New Patients	*24*	
	Transfer from another hospital	*0*	
	Returns from HD	*0*	
	On hospital IPD	*3*	
	In Subtotal		*27*
Out			
	Transplants	*3*	
	Transfer to other units	*0*	
	Transfer to Home Haemodialysis	*0*	
	Temporary Transfers to Haemodialysis	*0*	
	Permanent Transfers to Haemodialysis	*10*	
	Return of renal function	*0*	
	Withdrawal from dialysis	*2*	
	Deaths on PD	*3*	
	Out Subtotal		*18*
	Net gain	*9*	
	PD patients December 31st 2013		*64*

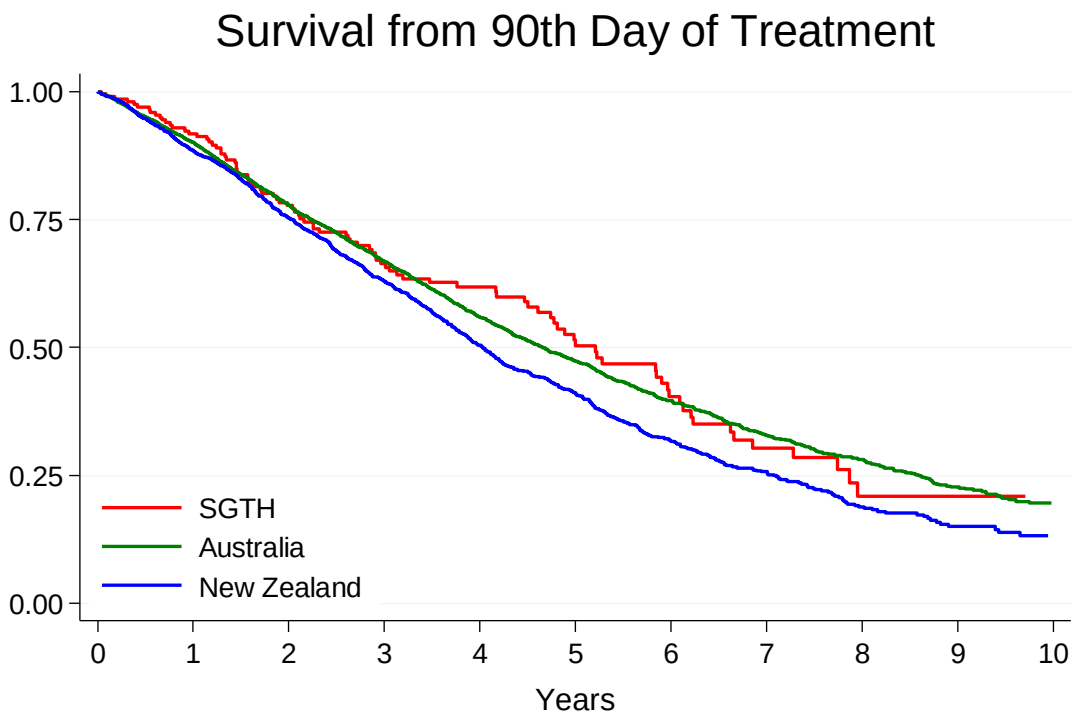
Change of modality and deaths

	St George 2010 (%)	St George 2011 (%)	St George 2012 (%)	St George 2013 (%)	ANZDATA 2012 (%)
Transplants	4	2	5	4	10
Change to haemodialysis	41	17	16	15	16
Deaths	18	7	9	8	13

Note: The rates are calculated using the total number of patients on peritoneal dialysis at 31.12.2013 (n=64), the method used by ANZDATA to calculate their rates.

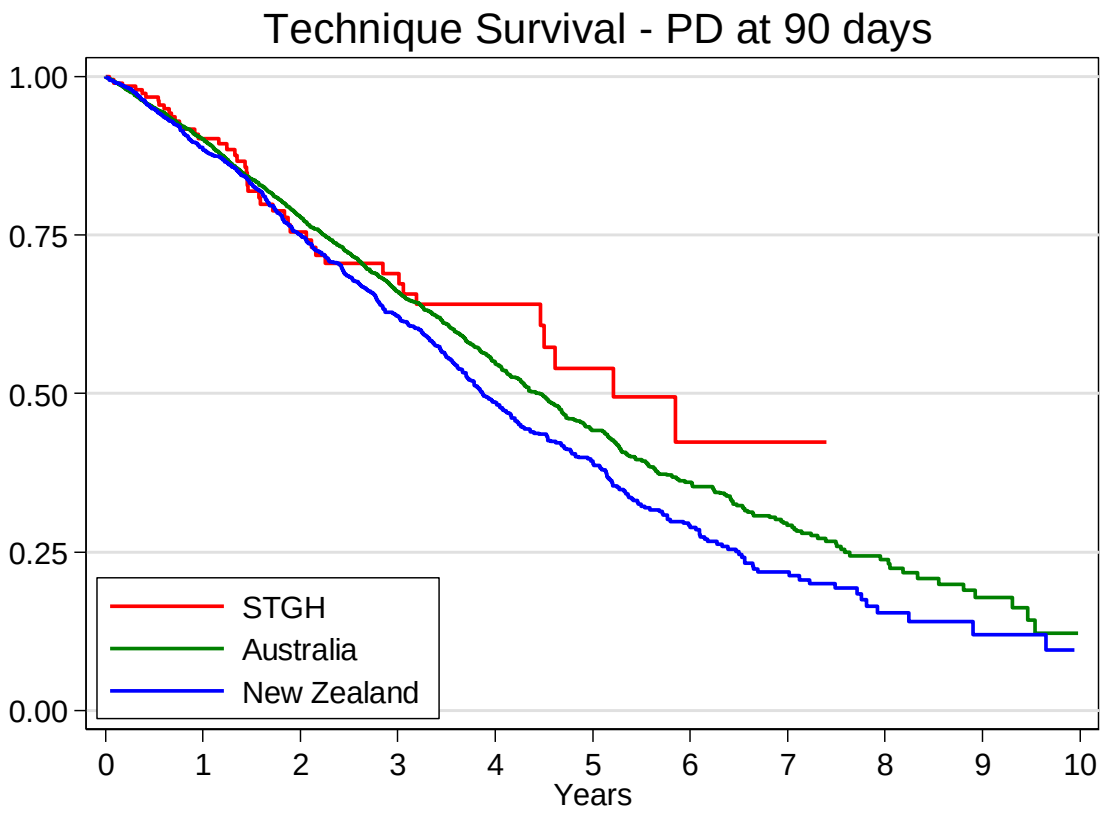
We have fewer deaths than the national average but also fewer transplants in our PD patients.

ANZDATA provided the PD Patient and Technique Survival of St. George Hospital (STGH) compared to Australia and New Zealand results. These results were calculated from 01 Jan 2002 – 21 DEC 2012 ANZDATA database. The 10 year result shows good patient outcome and technique survival.



PD patient survival -PD at 90 days. ANZDATA individual hospital report 2002-2012

Time	STGH n	STGH Survival Percentage	AUS n	AUS Survival Percentage
0	206	100.0	7032	100.0
3 months	197	98.5 (95.5-99.5)	6561	97.6 (97.2-98.0)
6 months	188	97.0 (93.5-98.6)	6069	95.1 (94.5-95.6)
1 year	168	91.8 (86.9-94.9)	5132	90.1 (89.3-90.8)
2 years	125	77.7 (70.8-83.1)	3662	77.8 (76.7-78.9)
3 years	93	66.3 (58.5-73.0)	2588	66.8 (65.5-68.1)
4 years	70	61.8 (53.7-68.9)	1773	55.9 (54.4-57.4)
5 years	46	50.4 (41.4-58.7)	1138	47.3 (45.6-48.9)
6 years	31	40.3 (31.0-49.5)	712	39.6 (37.8-41.3)
7 years	18	30.4 (21.2-40.0)	423	32.8 (30.9-34.7)
8 years	7	20.9 (11.7-31.8)	238	28.1 (26.1-30.1)
9 years	5	20.9 (11.7-31.8)	116	22.7 (20.5-25.0)
10 years	2	20.9 (11.7-31.8)	43	19.6 (17.0-22.2)



PD technique Survival - PD at 90 days. ANZDATA individual hospital report 2002-2012

Time	STGH n	STGH Survival Percentage	AUS n	AUS Survival Percentage
0	206	100.0	7032	100.0
3 months	185	98.5 (95.4-99.5)	6232	97.6 (97.2-98.0)
6 months	160	96.8 (93.0-98.5)	5491	95.1 (94.5-95.6)
1 year	122	90.2 (84.5-93.9)	4225	90.2 (89.4-90.9)
2 years	65	75.5 (66.5-82.4)	2437	77.9 (76.6-79.1)
3 years	43	68.9 (58.9-77.0)	1383	66.1 (64.5-67.7)
4 years	27	64.1 (53.2-73.1)	764	54.9 (52.8-56.8)
5 years	14	54.0 (39.7-66.2)	384	44.2 (41.8-46.5)
6 years	6	42.4 (24.4-59.4)	190	36.1 (33.3-38.8)
7 years	4	42.4 (24.4-59.4)	92	29.2 (26.0-32.5)
8 years	1	42.4 (24.4-59.4)	35	23.8 (20.1-27.7)
9 years	1	42.4 (24.4-59.4)	16	17.9 (13.3-23.0)
10 years	1	42.4 (24.4-59.4)	3	12.2 (6.8-19.3)

PD Adequacy, Biochemical and Haematological targets

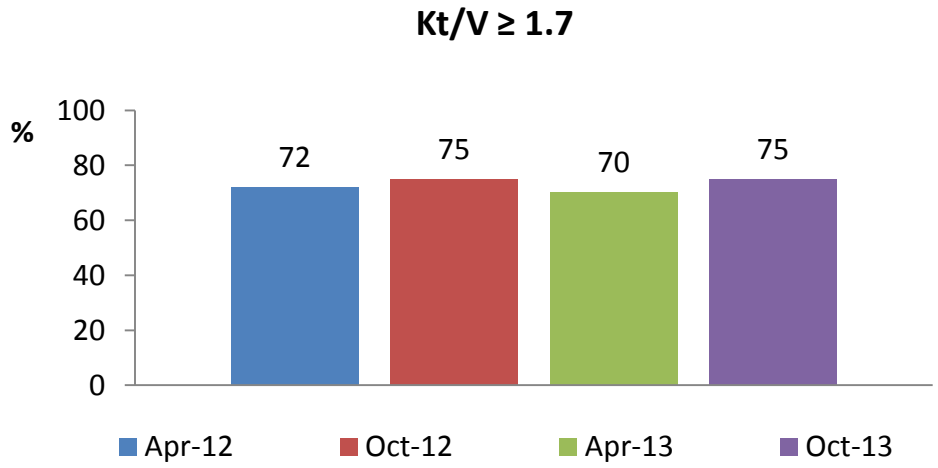
Aim

1. To compare dialysis adequacy using haematological markers, biochemical markers and Kt/V with previous audits. These are performed at 6-month intervals as per the CARI recommended guidelines with the exception of dialysis adequacy, which is conducted annually unless required earlier.
2. To ensure all patients have had a PET test performed to establish a baseline membrane transporter status.
3. To provide members of the renal team with individual patient's dialysis adequacy and biochemical and haematological marker results.

Method

Results are compared to the previous year and measured against the benchmark set by the CARI and KDOQI guidelines (2006). If any action is required, a meeting is organised in the peritoneal dialysis unit and actions are taken to resolve issues.

Peritoneal Dialysis Adequacy



Peritoneal dialysis adequacy is measured using Kt/V; the benchmark used is KDOQI with a target of at least 1.7 per week. No change can be seen over the audit periods. In October 2013 the mean Kt/V was 2.31.

Parameter	Target	Apr 12	Oct 12	Apr 13	Oct 13	ANZDATA 12
Corr Ca	2.1-2.4 mmol/L	32	33	34	50	-
PO4	0.8-1.6 mmol/L	42	36	42	53	45
$CaPO_4$	<4.0 mmol/L	42	39	40	50	63
Ferritin	200-800 ug/L	54	50	59	50	52
Transferrin	20-50%	60	64	70	63	70
Albumin*	33-48 g/L	46	33	44	29	-
PTH	7-45 nmol/L	65	50	67	58	-
KT/V	≥ 1.7	72	75	70	75	-
CCL	>50L (L & LA) or >60L (H & HA)		62	67	77	-

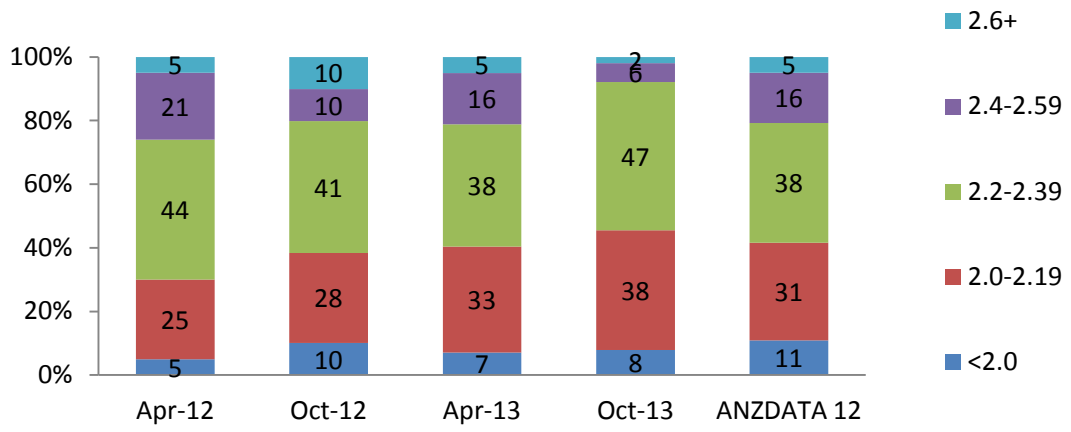
Albumin

- Only 29% of PD patients had an albumin level within 33-48 g/L in October2013. Half of these patients had albumin level 30-32 g/L and mean albumin level was 30 g/L. To address this issue, the annual review of PD patients by the dietician will progress to 6-monthly in 2014. The 6-monthly dietician follow-up and review will correlate with the 6-monthly biochemistry audit.

Serum Calcium

- 50 % of patients achieved the target for serum corrected calcium, however, the ANZDATA benchmark is for uncorrected calcium only.
- We have a higher percentage of people with serum Ca level 2.2-2.4 in October 2013

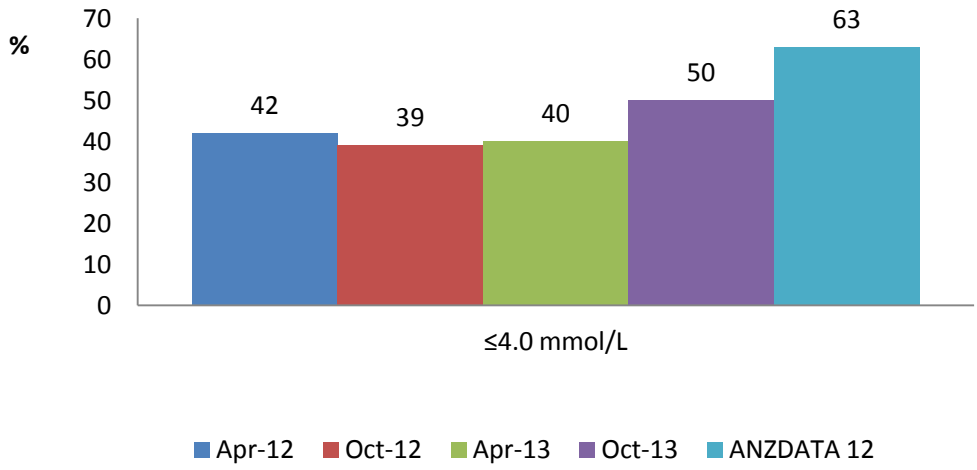
Serum Calcium (mmol/L)



Calcium Phosphate Product

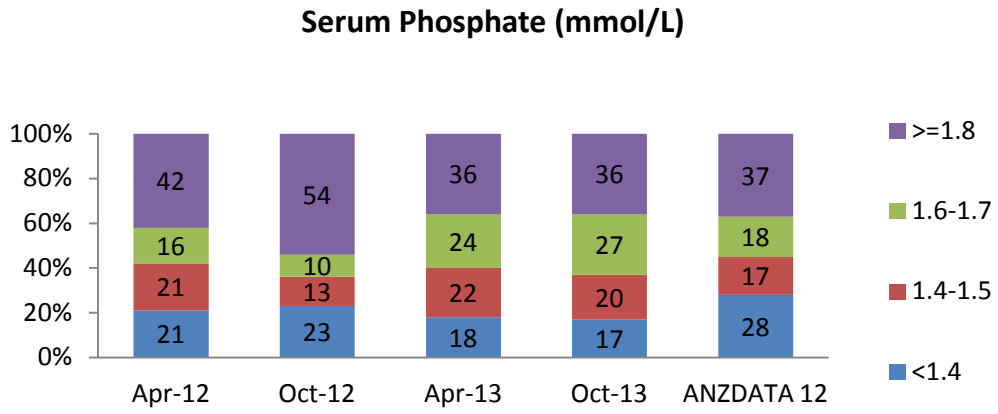
- Calcium x Phosphate product did not match the ANZDATA benchmark results in October 2013 but has improved from previous year's results.

Calcium x Phosphate Product



Phosphate

- Our profile for serum phosphate is very similar to the national data (ANZDATA). The mean Phosphate result in October 2013 was 1.74 mmol/L (min 1.0, max 3.01).

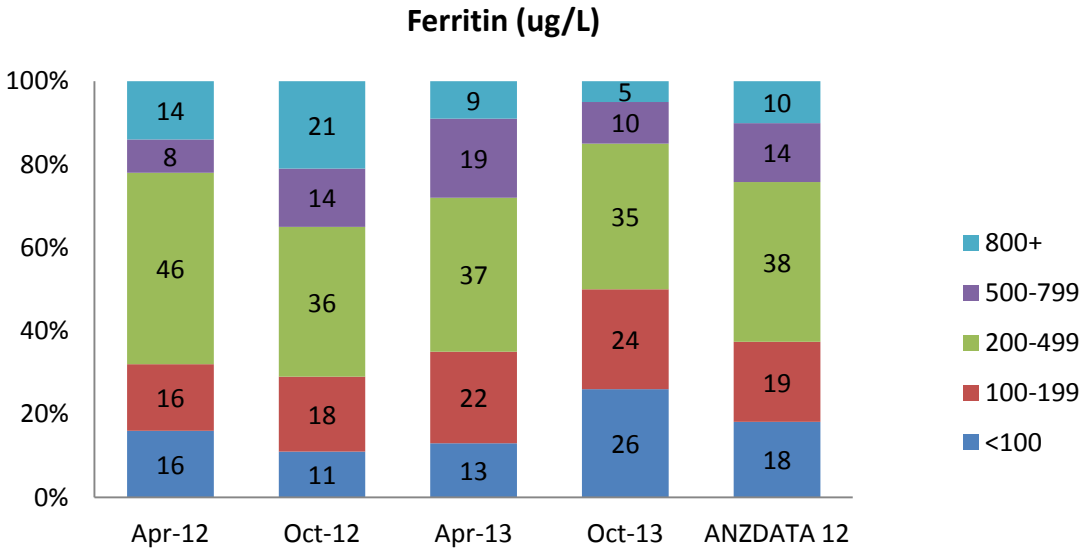


PTH

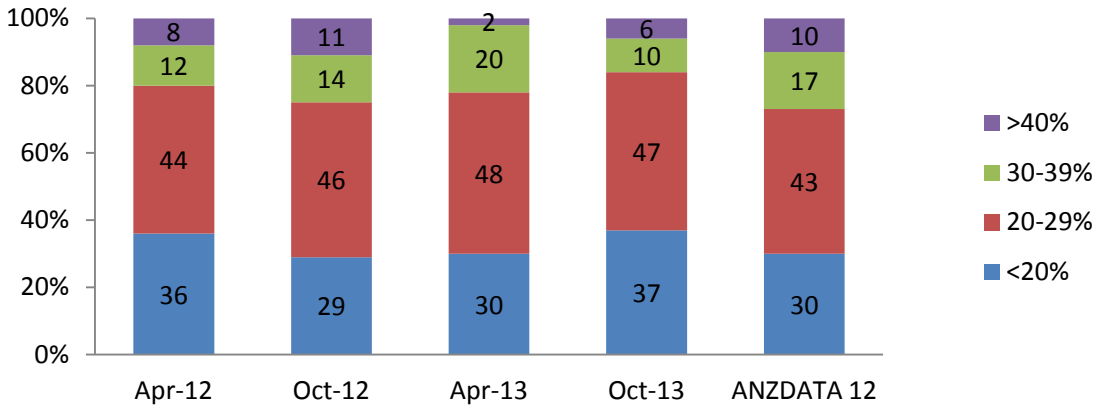
- In October 2013, 58% of PD patients had PTH 7-45 mmol/L, a slight improvement from previous year's result. The mean PTH result in October 2013 was 35 nmol/L (min 3.8, max 131.6).

Iron

- Iron replete refers to ferritin levels between 100-800ng/mL as well as iron saturation between 20-50%. 52% of PD patients were iron replete in October 2013 compared to 63% in October 2012



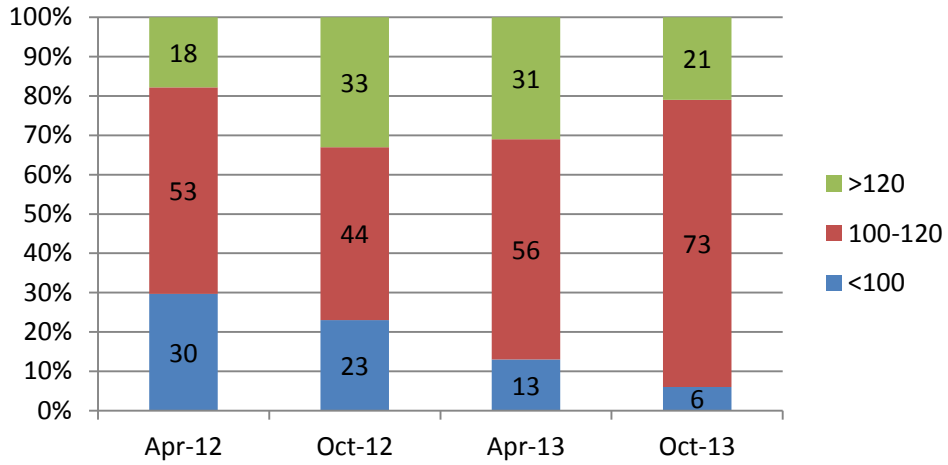
Iron Saturation (Transferrin)



Haemoglobin

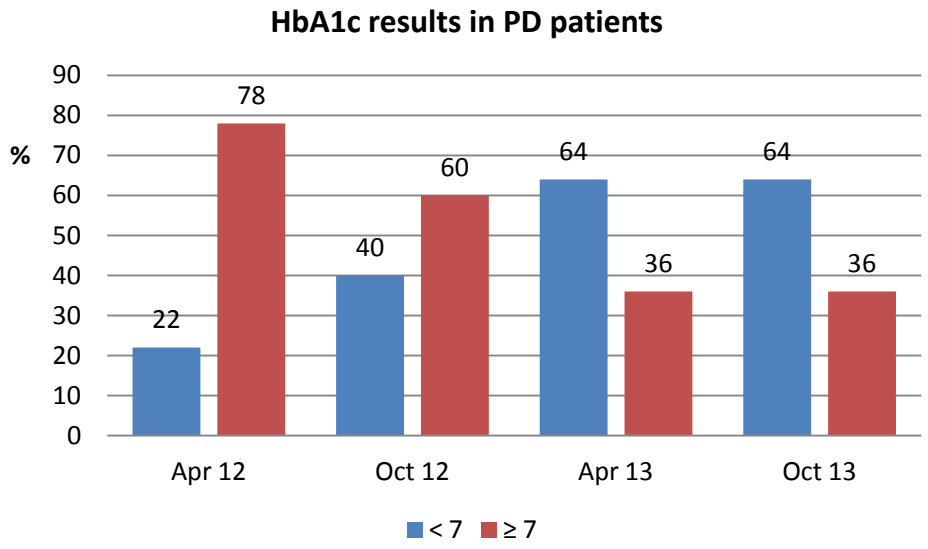
- 73% achieved our target of 100-120 g/L in October 2013 compared to 44% in October 2012
- Further analysis shows in October 2013, all PD patients with Hb <100 were receiving an ESA. 46% of patients with a Hb >120 were also receiving ESA, dose was reduced or stopped for these patients. 25% of patients who had Hb below target 100 g/L had abnormal iron studies.

Haemoglobin in Peritoneal Dialysis patients



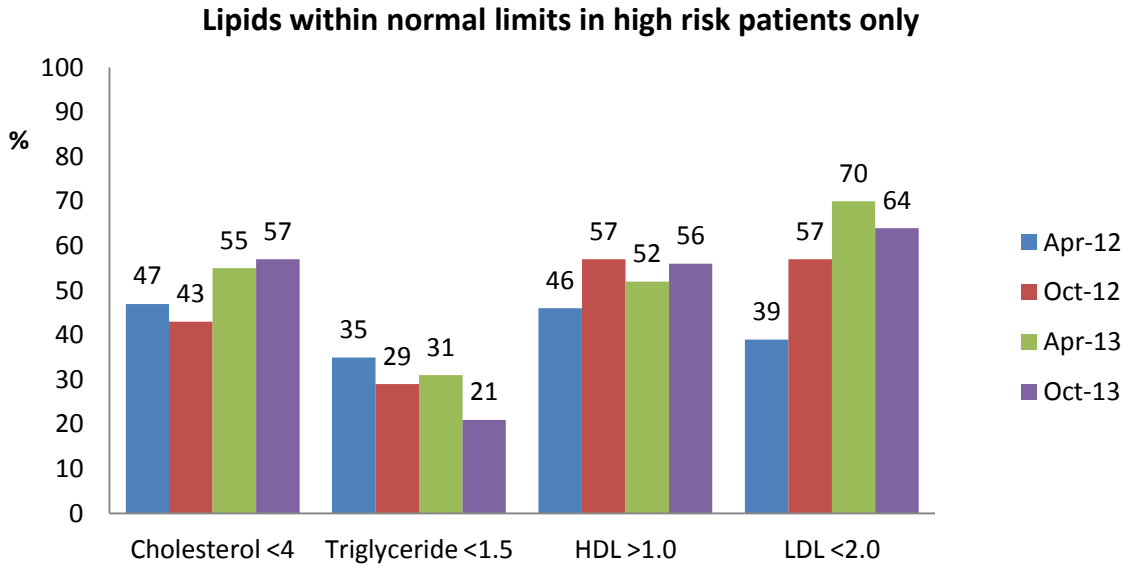
HbA1c (Glycosylated Haemoglobin)

- In October 2013, 42 percent of peritoneal dialysis patients had diabetes. 22/27 diabetics were screened for HbA1C with the average result of 7.4, minimum 5.1, maximum 13.7. 64% of the patients screened had results below 7, an improvement from previous years.



Lipids

- Lipid studies were collected for high-risk patients (n=46); these include patients having or suspected of having diabetes, coronary artery disease, cerebrovascular disease and peripheral vascular disease. Total cholesterol results have improved from previous years except for Triglyceride which remains an ongoing problem.



Infections in Peritoneal Dialysis

Aim

1. Identify peritonitis rates and exit site infection rates in the peritoneal dialysis population, expressed as incidence per patient month, peritonitis free dialysis time and number of episodes per patient years.
2. Identify number of episodes per patient.
3. Identify causative organisms.
4. Peritonitis rates are compared with the national benchmark reported by ANZDATA (2012).
5. Causative organisms and exit site infection rates are compared with previous years.

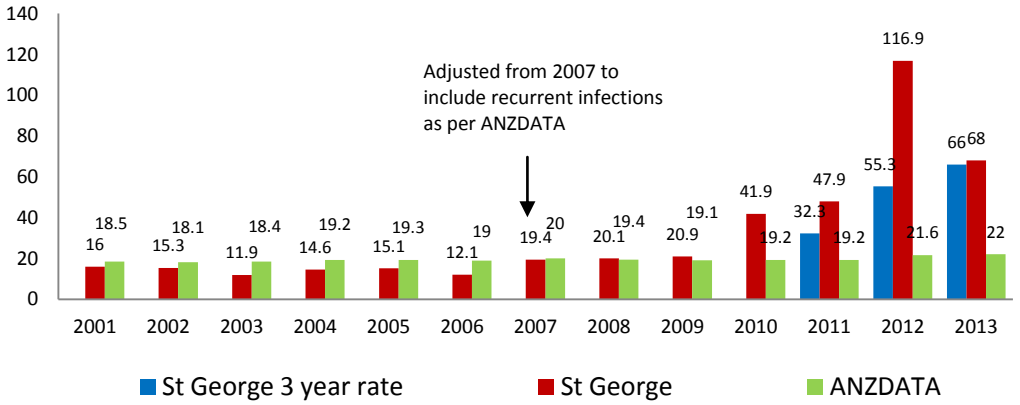
Method

1. Peritonitis Episode Forms from ANZDATA are used to collect peritonitis information (organism, treatment, admission) regarding every peritonitis event. Patient records are reviewed for exit site infections.
2. Recurrent infections were defined as 'within four weeks of the last antibiotic dose (or within five weeks if intermittent Vancomycin used) for the same organism' (ANZDATA 2008).
3. Recurrent peritonitis infections are included from 2009 onwards in this report.

Peritonitis episodes and rates

- 2013 peritonitis rate results continue to surpass the national benchmark. The St George peritonitis rate over a 3 year period from 2011–2013 improved to 1/66 months. ANZDATA 2012 reports the APD rate at 1/21 months, St George APD rate for 2011-2013 is 1/63.6 patient months.

Patient months per episode of peritonitis



- 80% of patients dialysing on December 31st 2013 were peritonitis free.
- Combined peritonitis and exit site infection percentage remains lower since data collection while the total numbers of patients are stable.

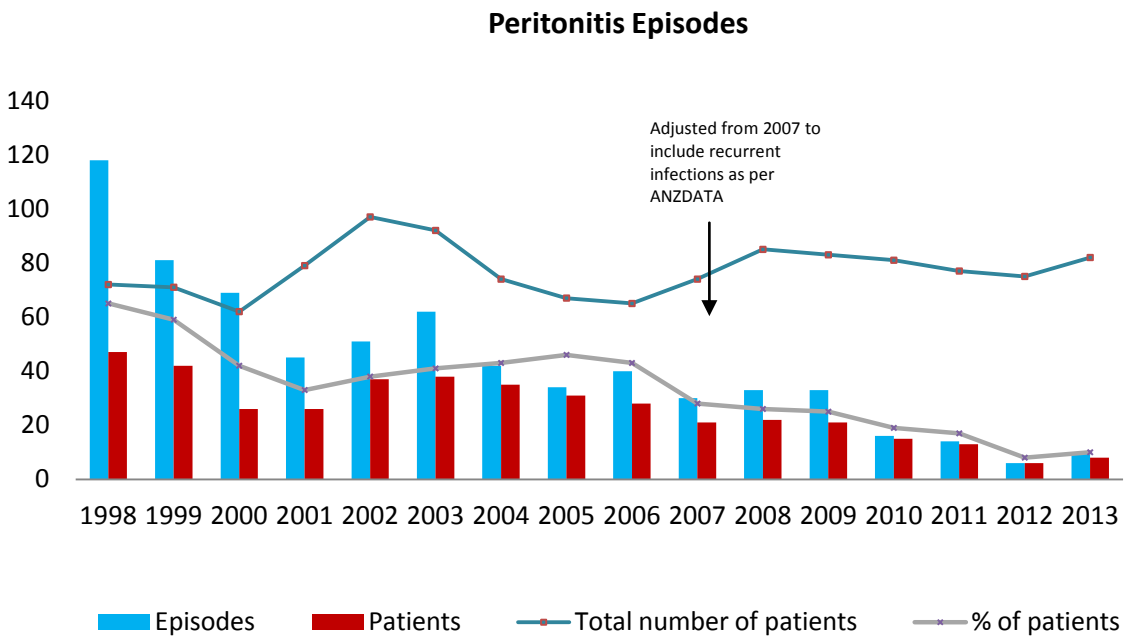
Peritonitis episodes

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total patients	71	62	79	97	92	74	67	65	74	85	83	81	77	75	82
Peritonitis episodes	81	69	45	51	62	42	34	40	30	33	33	16	14	6	10
Patients with at least 1 episode of peritonitis	n=42 59%	n=26 42%	n=26 33%	n=37 38%	n=38 41%	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%
Patients with at least 1 episode of Exit site infection	n=43 60%	n=33 53%	n=21 27%	n=32 33%	n=38 41%	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%

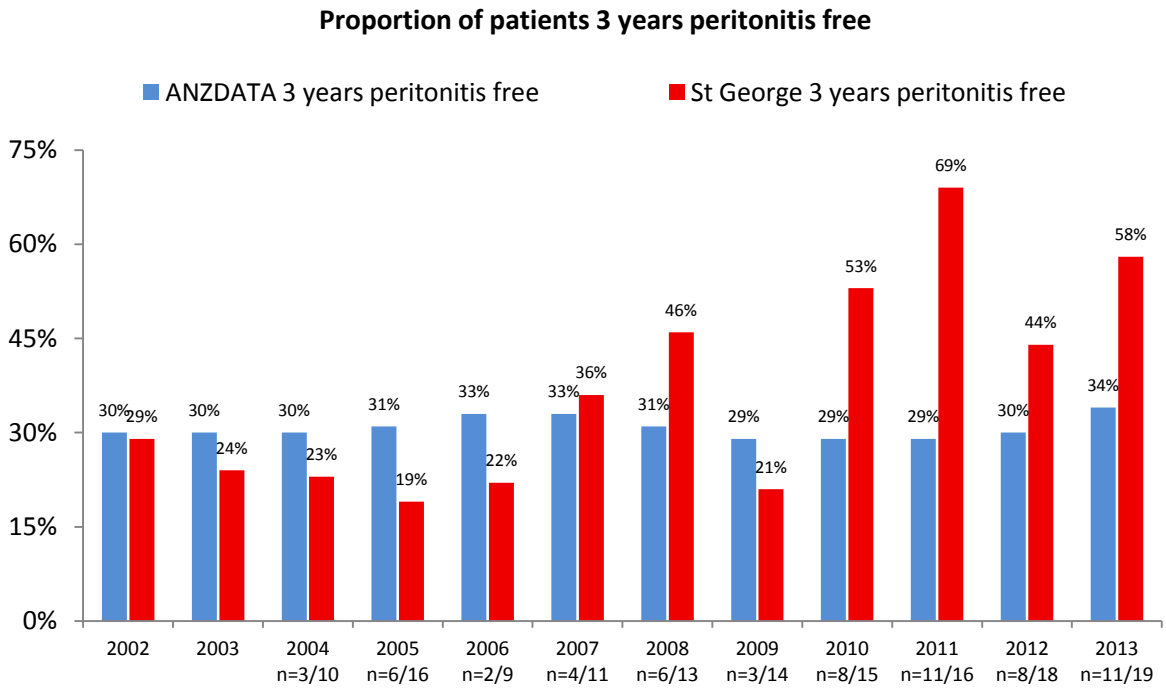
Rates of peritonitis (per patient-year) ANZDATA Individual Hospital Report 2007-2012

	STGH			Australia		
Year	Episodes	Years	Rate (95% CI)	Episodes	Years	Rate (95% CI)
2007	30	46.89	0.64 (0.43-0.91)	1193	1957.72	0.61 (0.58-0.64)
2008	33	53.20	0.62 (0.43-0.87)	1307	2054.61	0.64 (0.60-0.67)
2009	33	55.02	0.60 (0.41-0.84)	1244	2089.52	0.60 (0.56-0.63)
2010	16	54.22	0.30 (0.17-0.48)	1095	2032.82	0.54 (0.51-0.57)
2011	15	53.91	0.28 (0.16-0.46)	858	1943.92	0.44 (0.41-0.47)
2012	6	56.06	0.11 (0.04-0.23)	768	2031.85	0.38 (0.35-0.41)
Overall	133	319.30	0.42 (0.35-0.49)	6465	12110.44	0.53 (0.52-0.55)

- The number of episodes of peritonitis and the number of patients who had peritonitis in 2013 remains low. Better connection systems and patient training continues to contribute to the improvement in peritonitis episodes.
- 10 years ago 40% of our patients could expect peritonitis in any one year; that rate is now 10%.



- The proportion of peritoneal dialysis patients who are 3 years peritonitis free has improved to 58% and remains higher than ANZDATA 2012 (34%).



- 80 % (51/64) of patients on peritoneal dialysis in 2013 remain peritonitis free.
- The average time on dialysis for current patients who have had peritonitis is 39.6 months, and for those who are peritonitis free is 16 months.

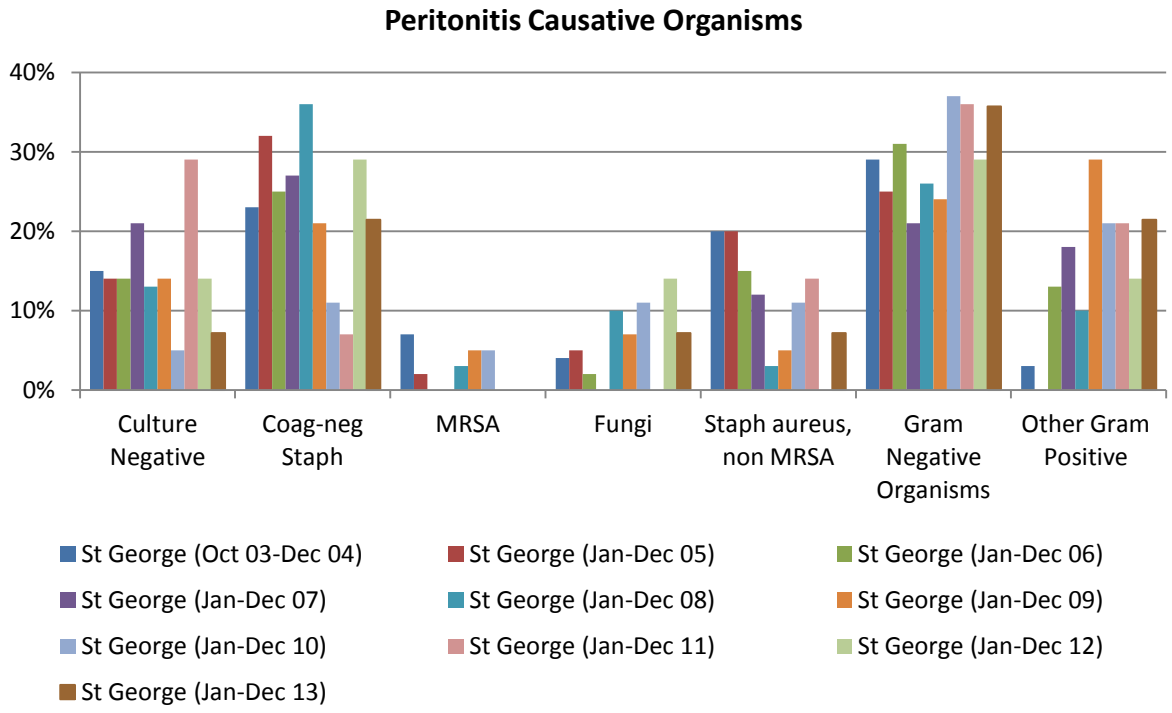
Change of treatment as a result of peritonitis

- The peritonitis data is measured to determine the rate of transfer to haemodialysis as a direct result of peritonitis. The results are listed in the following table:

Change in treatment as a direct result of peritonitis (%)	2006	2007	2008	2009*	2010*	2011*	2012*	2013*
				*includes recurrent infections				
Interim Haemodialysis	9	10	6	0	6	0	0	0
Permanent Haemodialysis	13	13	18	15(5/33)	24(4/17)	14(2/14)	16(1/6)	30(3/10)
Catheter removed	22	20	24	15(5/33)	41(7/17)	14(2/14)	16(1/6)	**20(2/10)

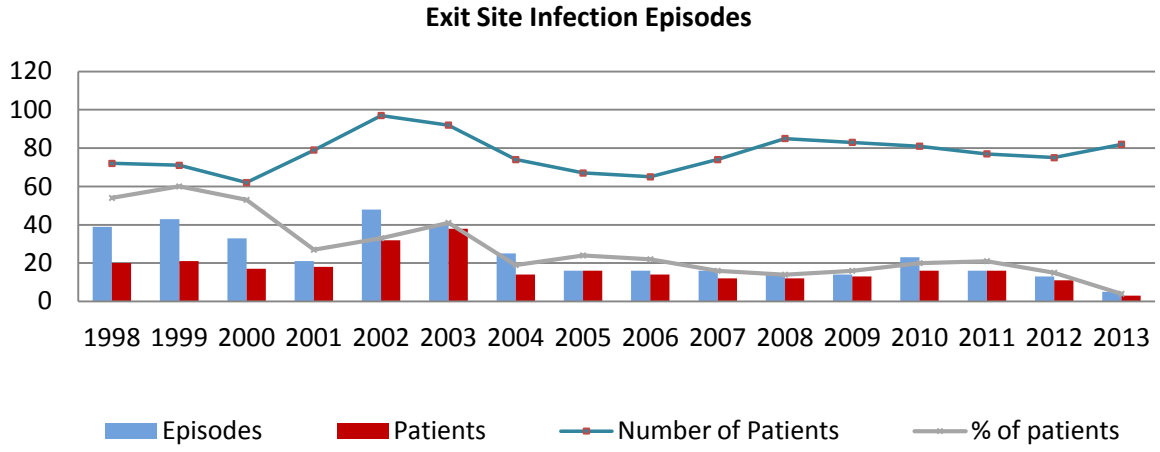
***1 x PDC was only removed in 2014*

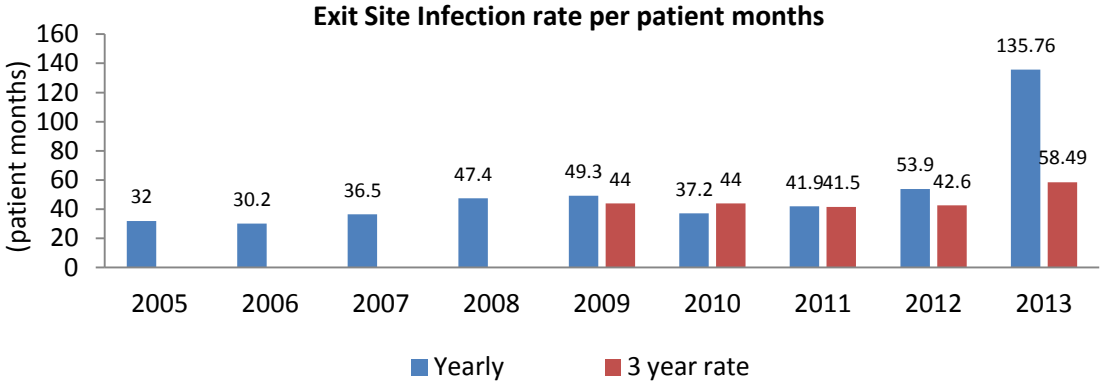
- 3 patients transferred permanently as a result of peritonitis.
- Main causative organism for peritonitis infections in 2013 was coagulase-negative staph. There was one fungal infection.
- Peritonitis causative organisms continue to fluctuate. Due to low numbers of infections from 2012 to 2013, the proportions of infective organisms are exaggerated.
- There were no MRSA peritonitis infections in 2013.
- Peritonitis caused by gram negative organisms appears to be in higher proportion in 2013, but due to the low number of infections, the proportions appear much higher.

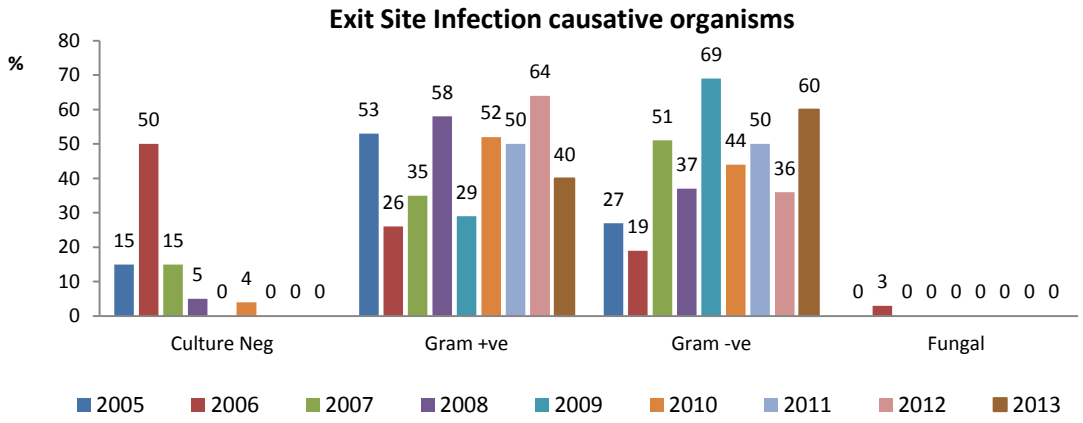


Exit Site Infections (ESI)

- Exit site infections have reduced considerably since data collection began. There was a significant decline in the percent of patients who have exit site infections, 4% in 2013 compared to 15-20% in 2010 -2012.
- ANZDATA does not collect data on Exit Site Infections; therefore there is no Australian benchmark data with which to compare.







Technique failure

- ANZDATA 2012 reports the most common primary cause of technique failure (ceasing peritoneal dialysis) was social reason at 44%, followed by total dialysis/technical failure at 35% and infection at 21%. St George primary cause of failure in 2013 is total dialysis/technical failure (60%) originating from blocked catheters, membrane failure resulting in inadequate solute clearance, leaks and surgery.
- Ten patients transferred to haemodialysis either temporarily or permanently during 2013. One patient transferred to haemodialysis for social reasons.
- The percent of patients transferring to haemodialysis through technical failure decreased in 2013. These transfers can be accounted for by abdominal surgery, inadequate solute clearance problems and pleural leaks. This is similar to previous reports.

Primary reason for technique failure	St George 2009 n=9	St George 2010 n=21	St George 2011 n=11	St George 2012 n=9	St George 2013 n=12	ANZDATA 2010
Infective	44%	24%	18 %	22%	30%	21%
Total Dialysis/Technical Failure (inadequate dialysis, leaks, surgery, mechanical)	44%	62%	73%	78%	60%	35%
Social (patient choice, failed training)	11%	14%	9%	0%	10%	44%

Summary

1. Infection and survival outcome remains well above the National average.
2. ANZDATA results are the benchmark used for comparison with St George results. The peritonitis incidence per patient months is 1/68 months for 2013.
3. All outcome measures of patient survival, peritonitis and technique survival are better than national outcomes.
4. The percentage of patient's peritonitis free at 3 years has improved to 58% in 2013 from 44% in 2012 which continues to be better than the ANZDATA results.
5. The marked reduction in the exit site infection rate to 1/135.7 months can be attributed to better patient education, follow-up and policy change. Routine exit site care includes mupirocin ointment and dressing regimen is tailored to patient needs.
6. The comprehensive training and retraining program in the PD unit and bi-annual patient newsletter continues to be effective in ongoing education for the PD patients.
7. The rate of failing PD due to social reasons continues to be lower than the rate reported by ANZDATA which implies patients remain happy with peritoneal dialysis.
8. There is room for improvement in improving phosphate control, iron management and nutrition, though these are not impacting upon patient survival at this stage. Monthly clinical review of PD patients between dietician, nephrologist and PD nurses is ongoing. In addition, nurse review of PD patients at renal clinics commenced in 2009 which has advanced into a structured clinic review project from 2013. It is projected to roll out on most renal clinics in 2014. This project provides a link between PD nurse assessment and nephrologist review which may assist in improving patient outcome through collaborative care planning.
9. Improved patient outcome in the recent years resulted in improved patient numbers on peritoneal dialysis.

Future plans

- Work closely with renal dietician in developing strategies to improve nutrition.
- Continue the effective initiatives and projects i.e. annual allied health talks, bi-annual patient newsletters, clinic review, outpatient support and retraining.
- Evolve what is already in place i.e. training program, pre-PD assessment and education.
- Investigate patient's dialysis experience and transition process through a project titled "Transition from PD" wherein strategies such as patient stories will be used.
- Reinstate annual people on PD support group meeting.
- Biannual patient satisfaction surveys.
- The annual review of PD policies on our website to continue, in the aim to keep it in line with ISPD best practice guideline.
- Re-introduction of a "Glitterbug" hand hygiene project to assess PD patients hand hygiene practice when training.

6. TRANSPLANT REPORT

Tania Burns and Kylie Turner

Aim

The aim of this report is to provide data about patients who have had a renal transplant and are under the care of a St George Hospital (SGH) nephrologist. It also provides data about patients who are currently on the National Organ Matching Service (NOMS) transplant waiting list, renal donors and the transplant assessment clinic.

Overview

In 2013 there were 188 patients under the care of SGH nephrologists with functioning renal transplants.

- 178 of these were primary grafts and 10 were second grafts
    - 47 (25%) of these patient received grafts from live donors
    - 10 (6%) were pre-emptive transplants
    - 3 ABOi
    - 2 paired kidney exchange
- 26 patients had known DSA's at the time of transplant

There were 48 SGH dialysis patients waiting for a kidney transplant and 4 patients with CKD who had completed work up and been assessed as suitable for transplant.

Activity during 2013

- 20 patients received a kidney transplant, one received a combined kidney liver and one received a combined kidney pancreas.
- 3 patients died with functioning grafts.
- 3 patients had graft failure and returned to dialysis.
    - Overall 3% of the transplant patients lost their graft in 2013
- 12 patients transferred out to other units (Liverpool, Campbelltown, and John Hunter) due to one nephrologist reducing his commitments and patient relocation, and two transferred in.
- A total of 65 patients were reviewed at the transplant assessment clinic by a nephrologist from Prince of Wales hospital, the transplanting unit.

Transplant patient flow

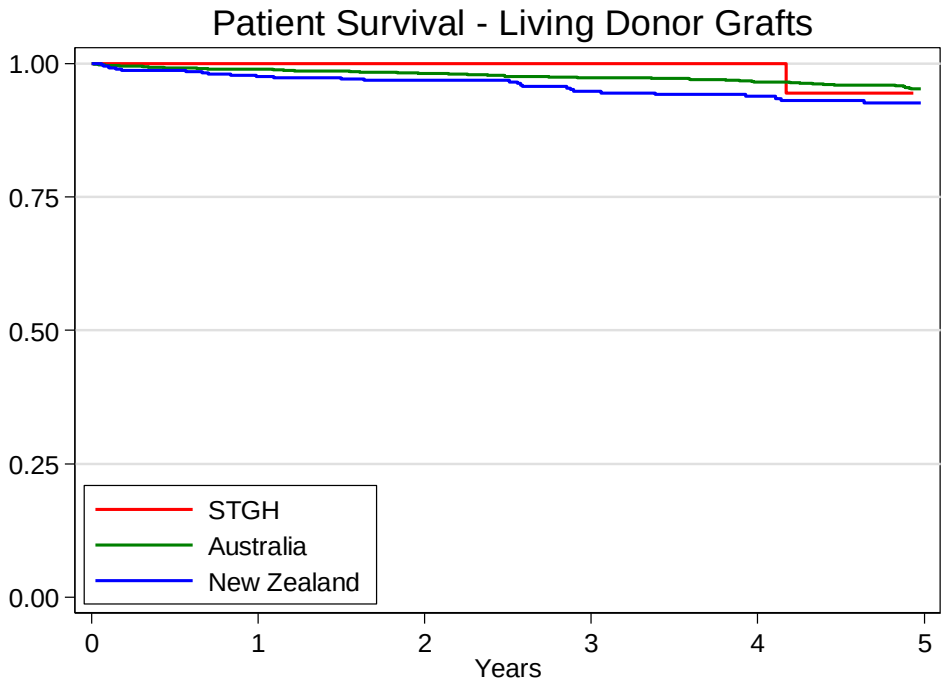
	1/1/13 SGH transplant patients registered with ANZDATA	**164**
Out	Transferred care out	12
	Died	3
	Graft failure transferred back to dialysis	3
	Subtotal out	**18**
In	Transplanted	22
	Transferred care in	2
	Subtotal in	**24**
	Net gain	**+6**
	31/12/13 SGH transplant patients	**170**

Patient and graft survival

KPI: 1 and 5 year graft and patient survival at or better than national

Patients transplanted between Jan 1st 2003 and Dec 31st 2012 (n=124, 3% of the National transplants in this time) are included in analyses provided by ANZDATA.

Outcomes for live donors meet our benchmarks but patient and graft survival for deceased donor transplants (n=93) do not.



The characteristics of the DD transplants at St George compared with National data (n=3906) are as follows:

1. Recipient age groups and gender are similar; fewer Caucasians at St George (69 vs. 80%) due to a larger Asian population.
2. Primary renal disease spectrum is similar
3. Slightly longer time on dialysis pre-transplant (85 vs. 76% over 2 years)
4. No difference in smoking rates, co-morbidities (IHD, CLD, CVD, PVD, diabetes)
5. Donor age > 60 only slightly higher (29 vs. 24%)
6. No difference in HLA mismatches, in fact better for zero mismatch (11 vs. 4%)
7. No difference in ischemic times
8. Fewer patients with creatinine <120 at 12 months (34 vs. 41%)
9. More deaths/graft loss (10 vs. 7%)

There is early graft loss that is probably statistically significant. The ANZDATA report shows that there is a 4.6% greater graft loss by 3 months; 6.3% by 12 months and 6.2% at 5 years. In other words, the period of worse performance against the National average is in the first 3 months with slightly greater deterioration at 12 months but not thereafter. We need to aim for achieving a greater % of patients with serum creatinine <120 umol/L by 12 months.

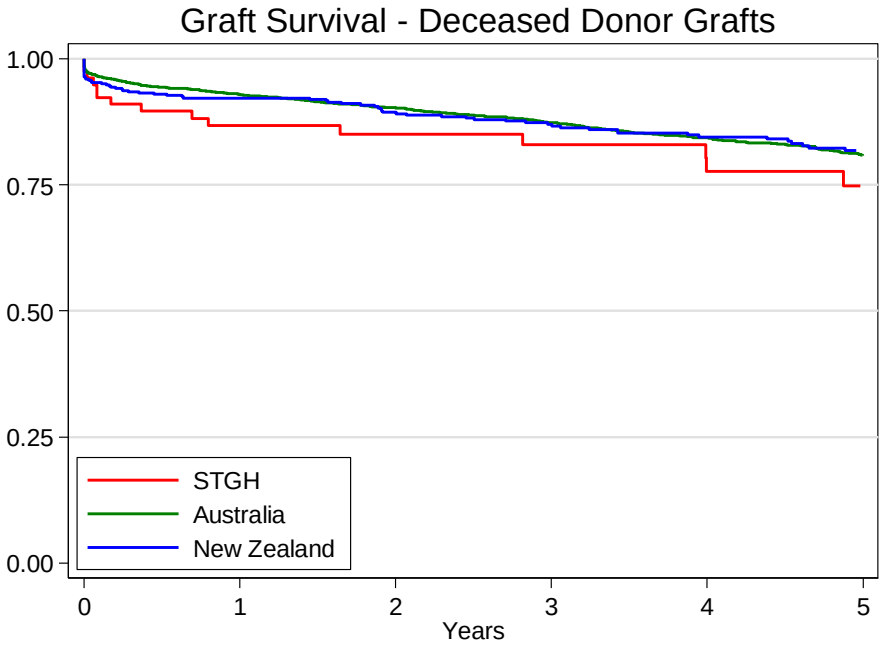
3 months	68	91.0 (82.1-95.6)	3060	95.6 (94.8-96.2)
1 year	57	86.7 (76.7-92.6)	2655	93.0 (92.0-93.8)
5 years	25	74.8 (60.4-84.6)	1053	80.8 (79.1-82.4)

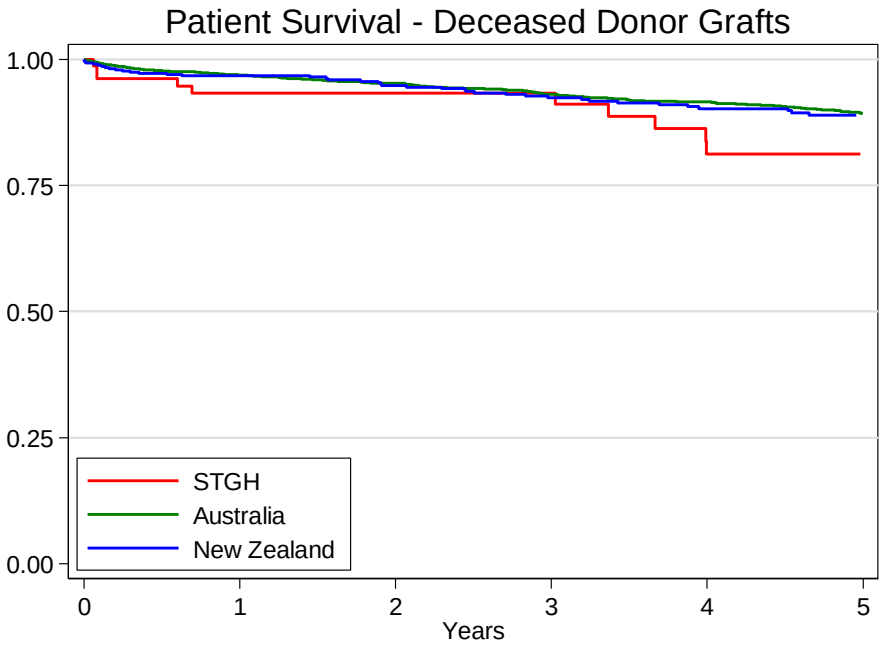
Causes of death were fairly similar to those nationally:

	STGH	Australia
Total Deaths	14	529
Cardiac	3 (21.4)	149 (28.2)
Vascular	2 (14.3)	40 (7.6)
Malignancy	1 (7.1)	110 (20.8)
Infection	4 (28.6)	129 (24.4)
Other	4 (28.6)	101 (19.1)

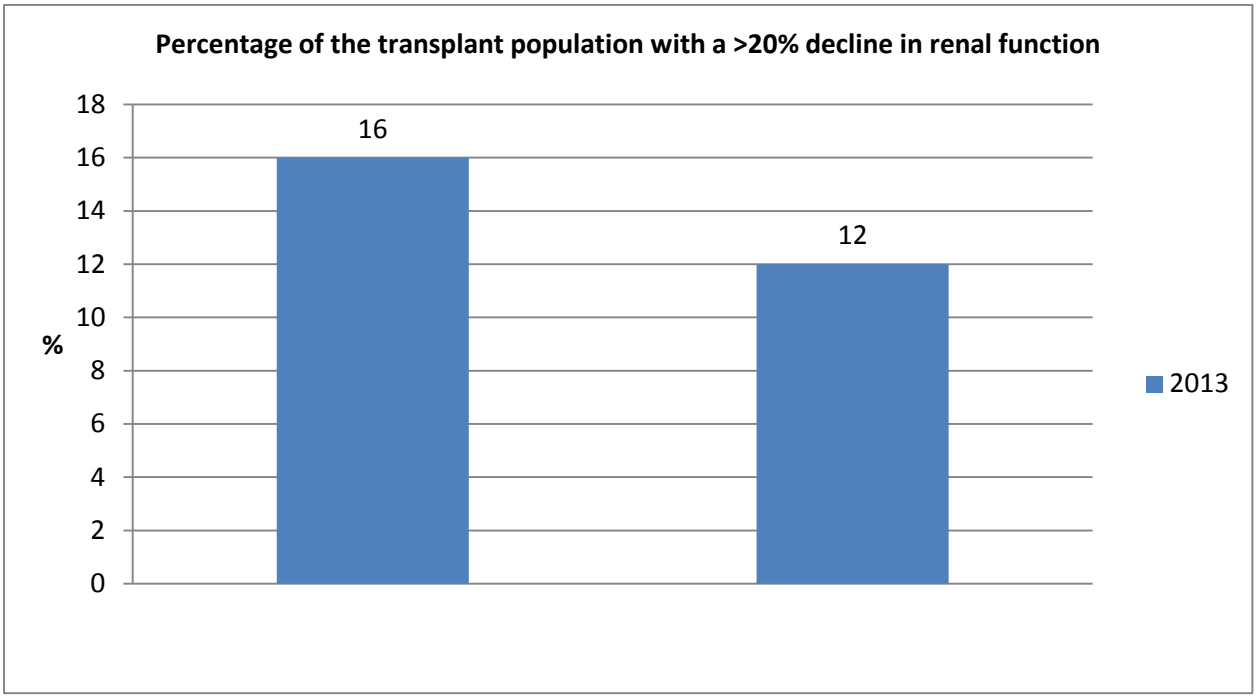
Patient survival was slightly less than nationally with 2.4% more deaths by 3 months, 3.6% by 12 months and 8.1% by 5 years. Attention needs to focus on preventing the very early and the later deaths which seem to occur from about 3 years post-transplant.

3 months	72	96.2 (88.5-98.7)	3156	98.6 (98.1-98.9)
1 year	61	93.3 (84.7-97.2)	2772	96.9 (96.3-97.5)
5 years	28	81.2 (67.0-89.8)	1175	89.3 (87.9-90.6)





Ongoing renal function



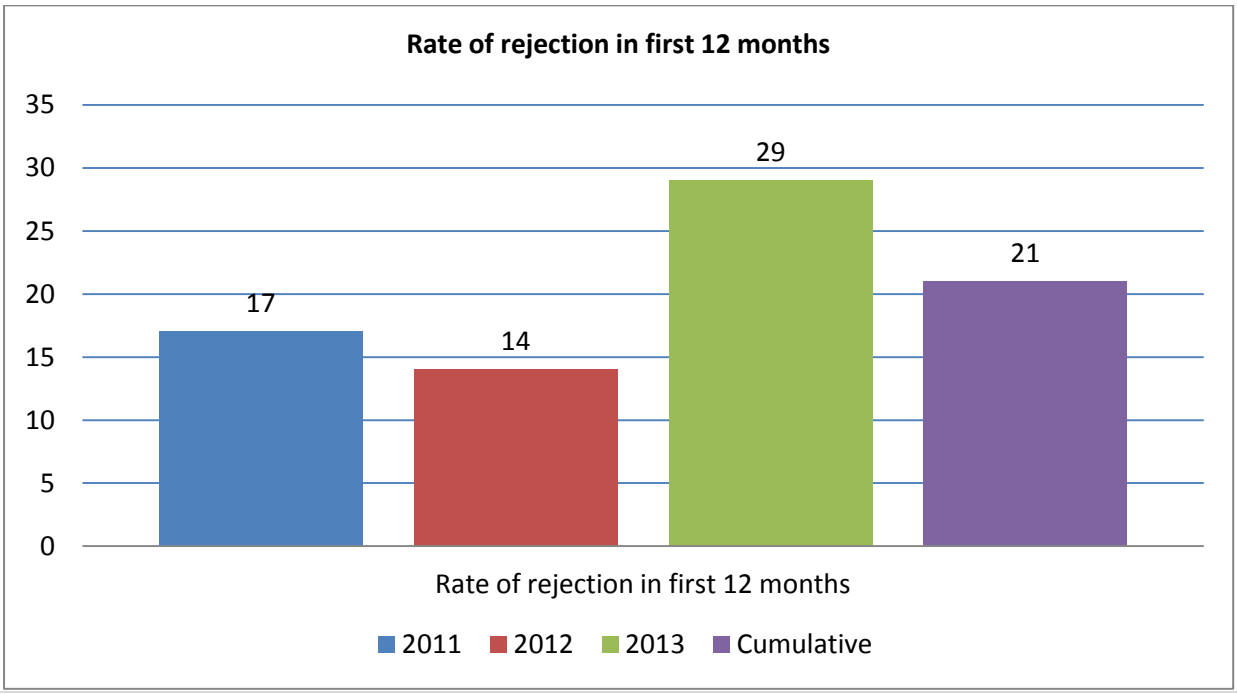
In 2013 31 patients (16%) had a >20% decline in renal function since 3 months post-transplant and 22 patients (12%) had a >20% decline within the last 12 months. 12 patients appeared in both categories, two of whom returned to dialysis. Ongoing tracking of graft function will continue and will be reported to the nephrologists twice annually as information that may assist with patient care.

Episodes of rejection

KPI: Episodes of biopsy proven acute rejection within first 12 months <30%

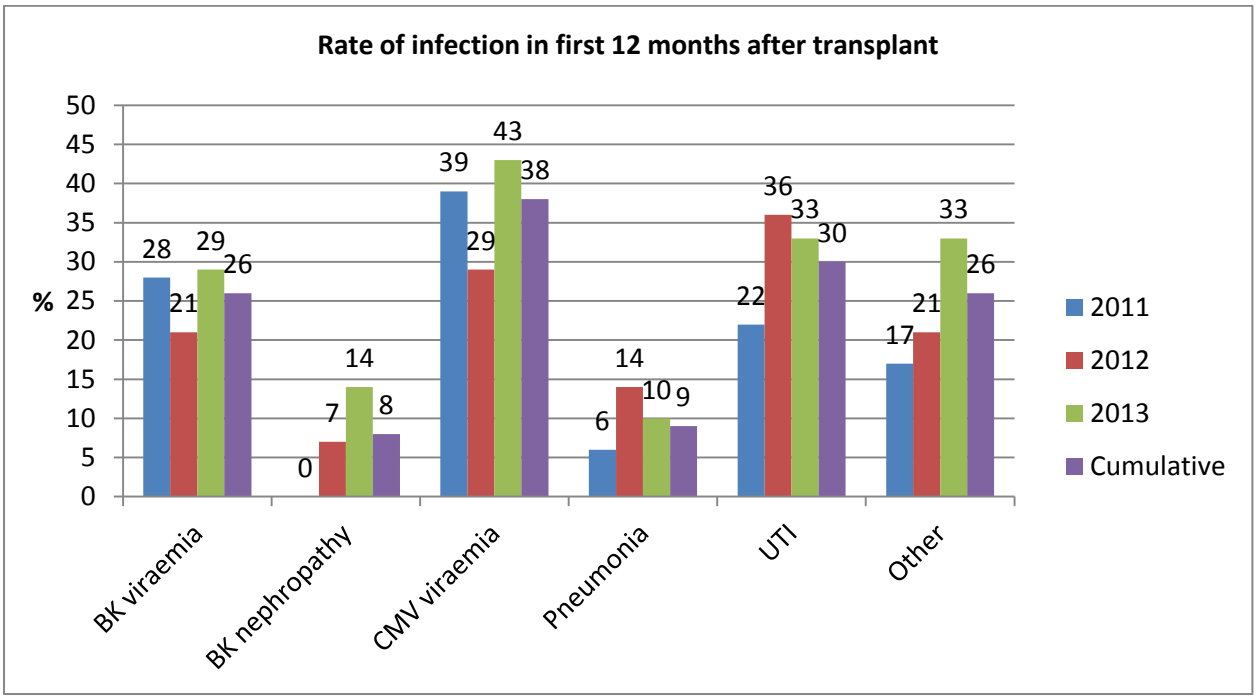
We are meeting this target though there was an increase in the BPAR rate in 2013, possibly related to transplanting patients with greater immune risk.

(Based on the 18 patients transplanted 2012 completing their first year of transplant 2013)



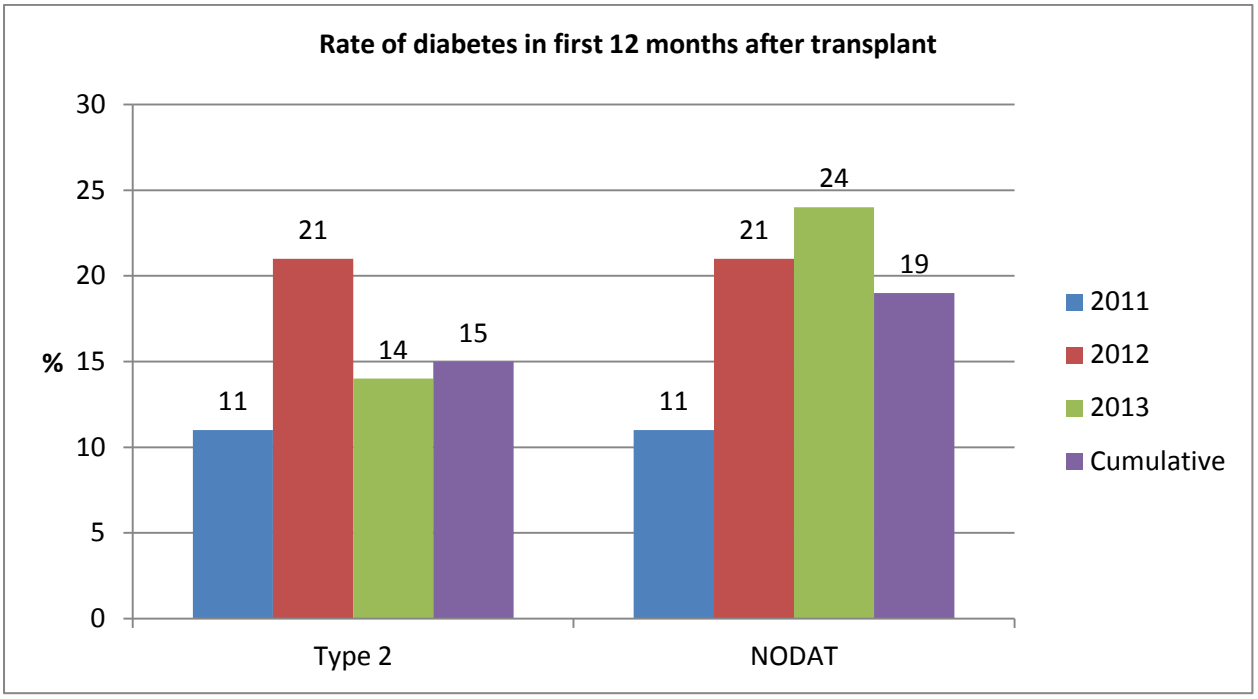
Infection

Rates of infection were constant in 2013 and overall death rates from infection are similar to national data.

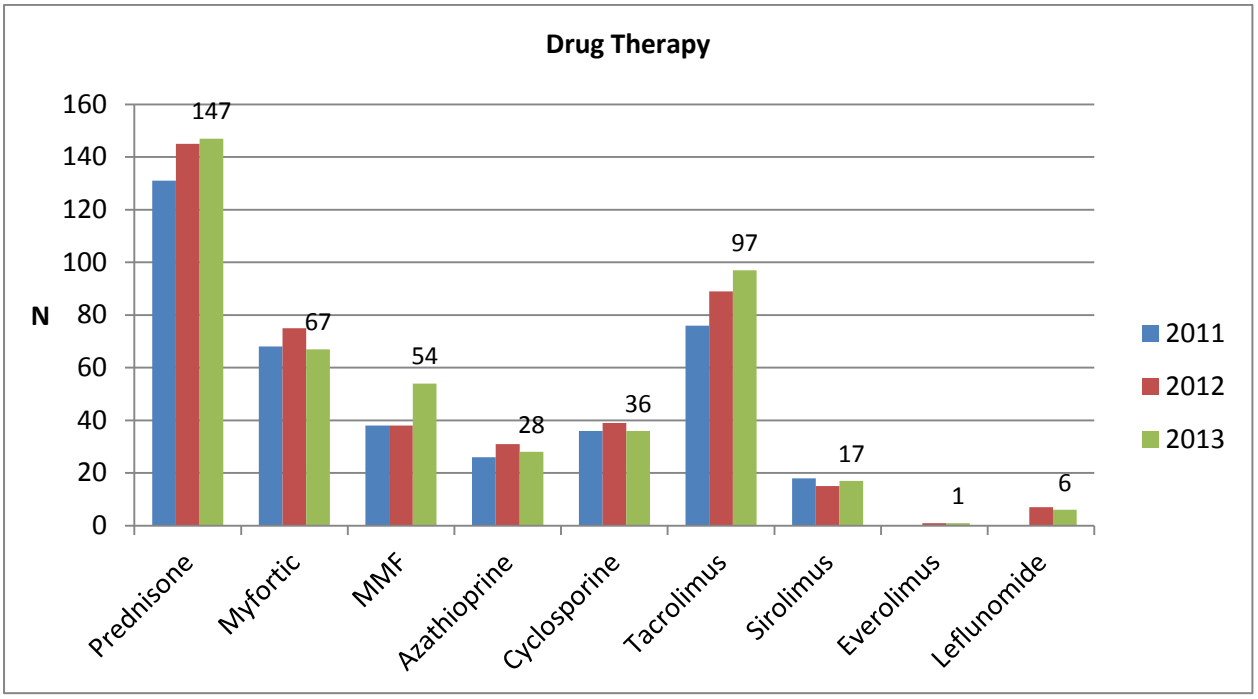


Diabetes

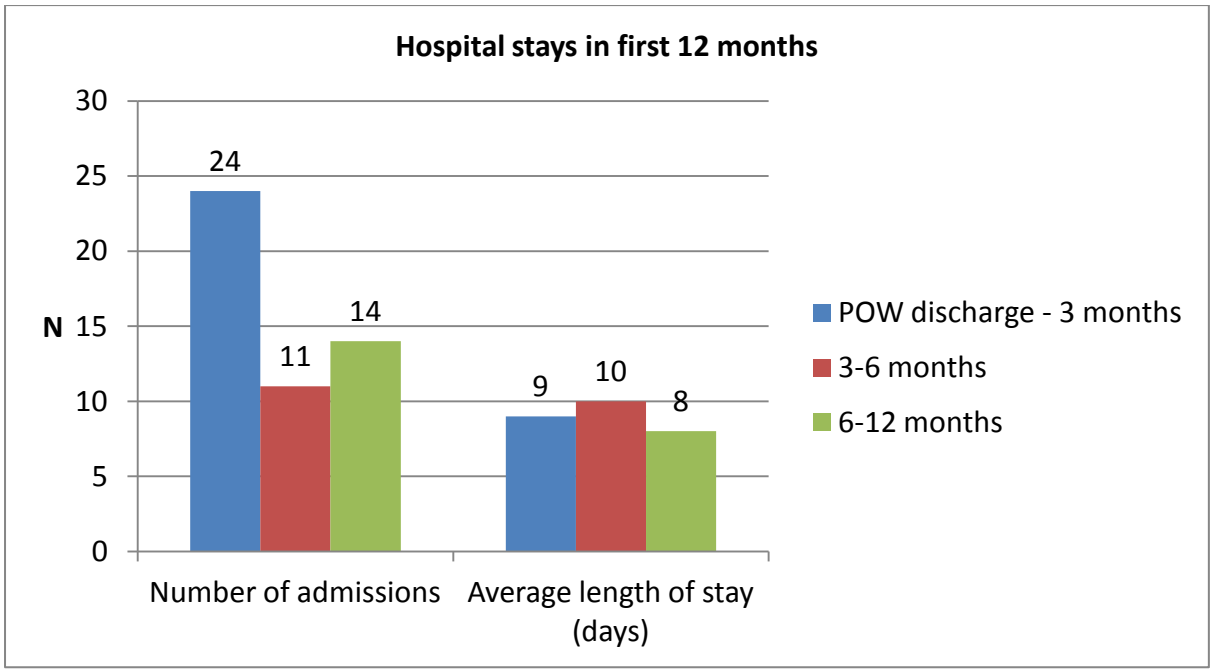
The higher rates of NODAT in 2012-3 are almost certainly due to better screening, including now full GTT. These outcomes are well within those reported in the literature.



Drug therapy

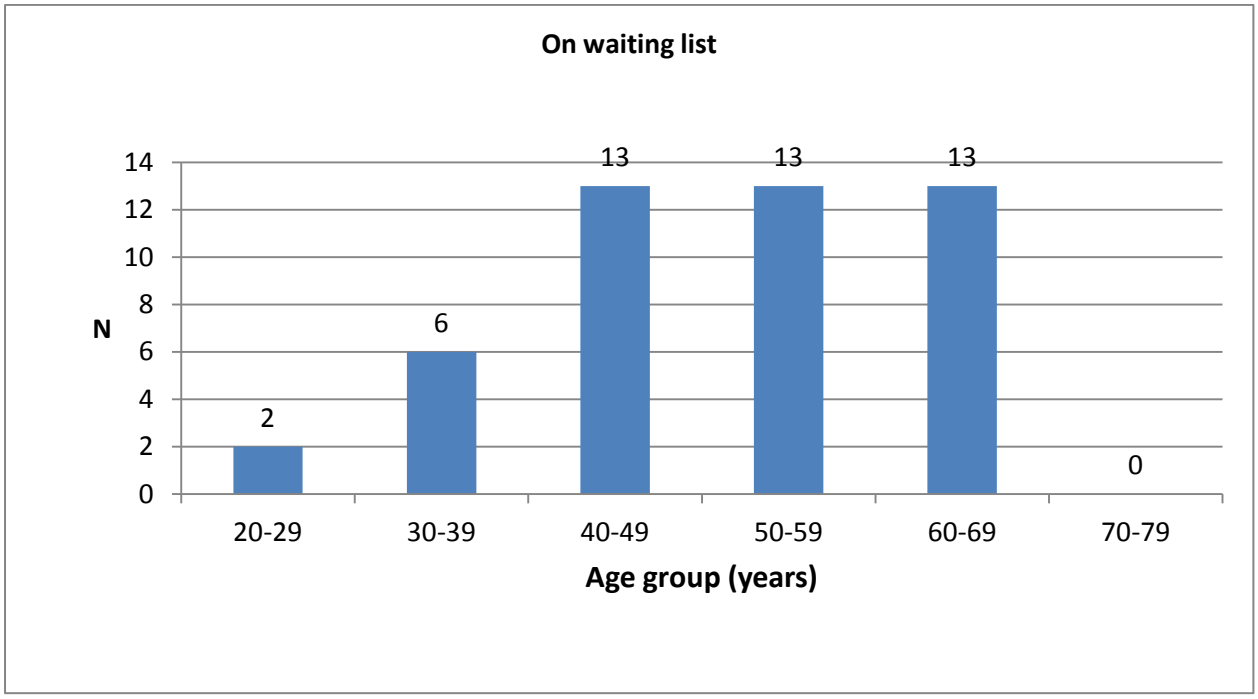


Hospital stays in first 12 months



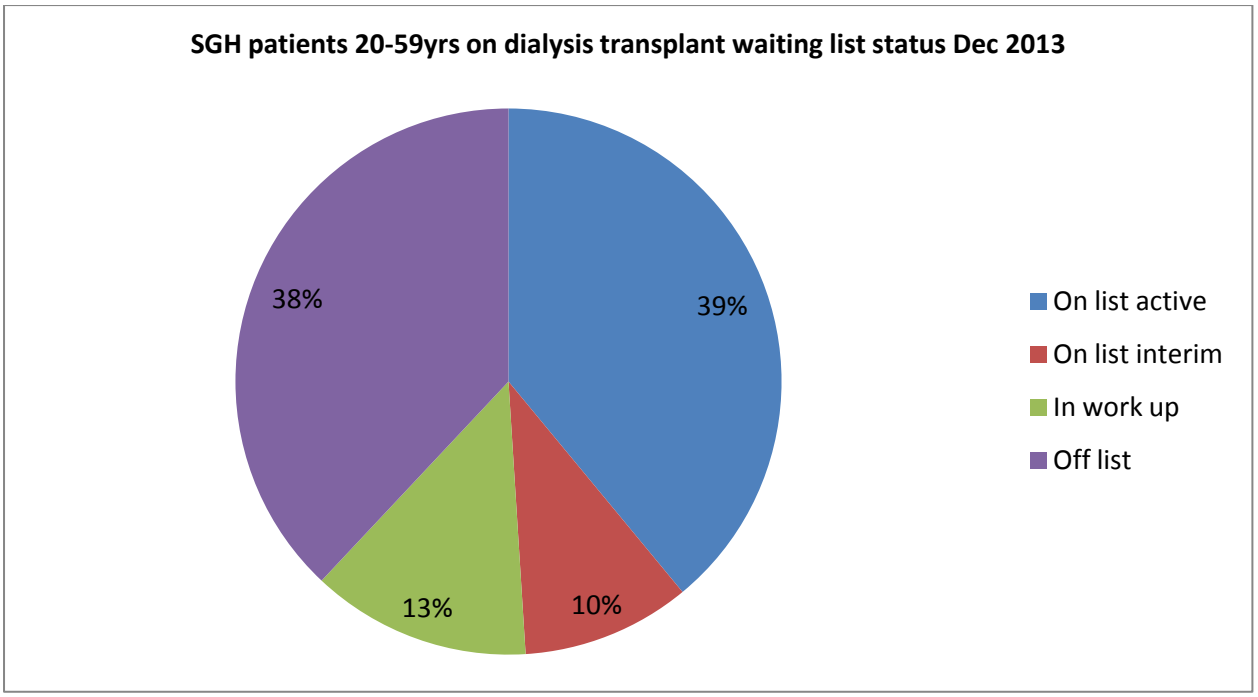
These data do not include admissions for protocol biopsies performed routinely at 3 and 12 months post-transplant, unless the stay was extended for a complication. Since 2012 the number of stays has increased from 31 with an average length of stay of 4 days, to 51 stays this year with an average length of stay of 8 days. However four patients accounted for 24 stays and 325 days. One of these had eight stays in hospital and a total of 161 days as an inpatient, with 119 days spent at Prince of Wales hospital, before his care was officially transferred at 12 months post-transplant. If these four patients are excluded from the numbers there were 27 stays with an average length of 4 days.

Waiting list data



More detailed investigation has been carried out into how many of the patients aged 20-59 years old and on dialysis are listed for transplant.

- 62% of SGH patients in this group are listed (either active or interim), or are in work-up
- The remaining 38% have specific medical or psychological reasons why they are not suitable for transplant such as: cardiac co-morbidity, complications of diabetes, obesity, non-compliance, previous cancer, previous failed graft, chronic depression, psychosis, patient preference.



When compared to national data a greater proportion of SGH dialysis patients are listed for transplant in every age group.

Age group (years)	NOMS list (Australia)	On dialysis (Australia)	% age group on waiting list (Australia)	NOMS list (SGH)	Dialysing (SGH)	% age group on waiting list (SGH)
20-29	74	237	**31%**	2	5	**40%**
30-39	151	580	**26%**	6	11	**55%**
40-49	254	1217	**21%**	13	22	**59%**
50-59	342	1961	**17%**	13	35	**37%**
60-69	289	2465	**12%**	13	55	**24%**
70-79	24	2701	**1%**	0	68	**0%**
80-89	1	1343	**<1%**	0	51	**0%**

7. RENAL SUPPORTIVE CARE SERVICE

Aim

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

Overview

The renal department has been working closely from 2009 to 2013 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 Jan Maree Davis, Dr Frank Brennan, Elizabeth Josland, Shelley Tranter, Hannah Burgess, Maria Chan, Gemma Collett, and Mark Brown 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; it increased from bi weekly clinics to weekly clinics in December 2010, and then increased again to add a small overflow clinic on occasional Fridays which ran from August 2011 to December 2013 until replaced by a new weekly clinic at Sutherland Hospital commencing 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 officer. The clinic also receives support from the renal social worker and dietician.

2. The fourth **Renal Supportive Care Symposium** was held on 9th August 2013. Doctors, nurses and allied health attended. There were over 190 attendees in 2010, 150 in 2011, 100 in 2012 and 122 in 2013 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 third annual **Renal Memorial Service** was held in May 2013 and was attended by approximately 30 people. This service aims to provide families and friends of past renal replacement therapy (RRT) patients with a supportive environment 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

	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

2013 clinic numbers were down due to multiple educational tours being undertaken to teach others about renal supportive care (see 'achievements') resulting in clinic unavailability. Table 1 indicated occasions of service for both inpatients and outpatients in 2013.

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, eGFR 16, albumin 34g/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 2009-2013

		Non-dialysis patients	Dialysis Patients
Age	Average age in years	82	67
eGFR mean	Average	17.9	
Diabetic		51%	48%
Dementia		10%	4%
Co-morbidities			
	2 or more	57%	34%
	3 or more	36%	12%
Current or former smokers		27%	49%

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 choice.

Inpatient consultation

The service has an average of 43 inpatients occasions of service per month with an average of five new inpatient referrals per month in 2013.

There was an increase in inpatient occasions of service in 2013, these are predominantly seen by the CNC. The majority of new referrals continue to be for pain and symptom management. The increase in inpatient activity in 2013 can be related to an increasing complexity of patients referred to RSC who were sometimes admitted for complex medical issues or end of life care requiring an increase in the frequency of CNC visits over a longer period of time for symptom management and psycho-social support.

Amongst the complex patients, there has been an increase in heart failure patients with ESKD referred to RSC while inpatients. These patients generally have cardio-renal syndrome requiring symptom management on a non-dialysis pathway with a higher tendency for readmission due to fluid issues and end of life care.

Outpatient services

Telephone consultations commenced in 2012 to assist patients who are too frail to physically attend the clinic. These can be made as part of a clinic appointment with Dr Brennan, or made by the renal supportive care CNC monthly to ensure patients are coping at home, require more symptom management or require referral for allied health services. There were 68 phone consultations in 2013 mainly by the CNC.

Home visits by the renal supportive care CNC commenced December, 2012. These aim to support the patient and family, allow for a nursing assessment, symptom assessment and appropriate referral to allied health or other services where required. The CNC attended 14 home visits during 2013. A number of patients were referred to the Calvary Hospital Community Palliative Care Team (CPCT) if they had complex symptoms and were approaching end of life in the community.

Advance Care Plans

Advance Care Planning commenced in the Renal Supportive Care clinic in August 2012. As of December 2013, there were 68 current RSC clinic patients who were not for dialysis (NFD), 17 (25%) had an Advance Care Plan (ACP) completed. These ACP's are sent to the patient's GP and loaded into eMR alerts. ACP's are updated yearly, this update is also recorded in eMR. Only 2 current dialysis patients have an advance care plan.

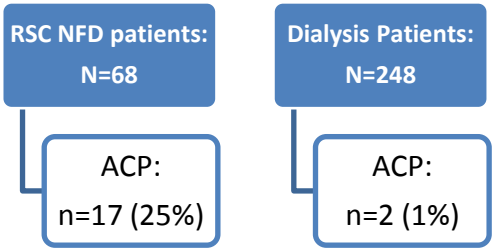


Figure 1: ACP's completed for current patients

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.
- 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.
- Helping Older Patients with End-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

- Urban, AK & **Brennan FP**. (2013) Patients who withdraw from dialysis in a Sydney centre with palliative care support: who, why, and how do our patients die? Progress in Palliative Care (21) 6, pp 325-330.
- Crail, S, Walker, R and **Brown, M** for The Renal Supportive Care Working Group (2013) Renal supportive and palliative care: position statement *Nephrology* 18, pp. 393–400.
- The Renal Supportive Care Working Group (2013), ANZSN Renal Supportive Care Guidelines, *Nephrology* 18, pp. 401–454.
- **Tranter S, Anastasiou A, Bazzi H, Burgess H & Josland E.** (2013) The renal memorial service: an important component of renal supportive care. RSA Journal (9) 2, pp 80-84.
- **Brennan FP, Brown M.** The ethics of dialysis – an alliance of Nephrology, Palliative Medicine and ethics. Quarterly Journal of Medicine 2013; 106(5): 397-400.
- Lim CED, Siow S, Ho KEH, Chua JL, Chong N, Cheng L, Kwok, Brennan FP, Cigolini M. Advance Care planning in haemodialysis patients. Protocol Information. Cochrane Reviews. Review number 294. September 2013.
- **Brennan FP**, Murrell DF. Report from the Inaugural Australian Pruritus Symposium, Sydney, Australia, August 10 2013. Acta Derm Venereol 2013. Oct 24 - Epub ahead of publication

Presentations and Teaching

- Dr Frank Brennan gave 20 presentations over 2013 (3 conferences, 1 KDIGO guideline working group, and a mixture of forums, symposiums, and lectures), and participated in teaching sessions on approximately 25 occasions, and 4 tutorials at Calvary Hospital regarding RSC.
- Dr Brennan, in collaboration with Professor Dedee Murrell, Department of Dermatology, St George Hospital co-organised the inaugural Australian Symposium on Pruritus. This included a session on the pathophysiology and management of Uraemic Pruritus.
- Dr Brennan provided a monthly outreach RSC service rotating around Tamworth, Moree and Armidale, NSW.
- Elizabeth Josland participated in 8 presentations (panel discussions and talks), and provided in-service education on multiple occasions throughout the year.
- Prof Brown gave 6 presentations on this topic, including the American Society of Nephrology conference in Atlanta and to the Sydney Nephrology group.

Achievements for 2013

- There have been a number of visiting doctors, nurses and allied health visiting the clinic throughout 2013 including one nurse from New Zealand who had a Program of Excellence in the Palliative Approach (PEPA) placement with us.
- 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 drafted for comment: “development and implementation of a State-wide Renal Supportive Care Service” and should be ready for publication in 2014.
- In 2013 renal supportive care guidelines were published in the Nephrology (2013) 18, pages 393-454. This was the culmination of a group project led by St George Hospital with a Renal Supportive Care Working Group made up of nephrologists, palliative care consultants, nurses, researchers, allied health and a Professor of Law from throughout Australia and New Zealand.
- In 2013 outcomes of our RSC service were presented in a plenary talk at the ASN in Atlanta.
- Dr Brennan has spoken at many conferences including a plenary talk at the Asia Pacific Hospice and Palliative Care Network Conference, Bangkok, Thailand and has taken part in the KDIGO meeting

'Supportive / Palliative Care in CKD', in Mexico City, Mexico which focused on the development of global symptom management guidelines.

Other notable achievements include:

- Dr Brennan, Elizabeth Josland and Gemma Collett were invited to participate in a PEPA Roadshow in western NSW on the topic - Renal Supportive Care – "Let's Get Renal" – Medical, Legal and Ethical Challenges. The tour was sponsored by PEPA with an enormous amount of organisation by Alison Dawes (Palliative Care CNC) from Dubbo and Janeen Foffani from PEPA. Towns visited were Bathurst, Dubbo, Brewarrina and Walgett over 4 days from 27th – 30th August.

Figure 2: PEPA Roadshow in Brewarrina

- Elizabeth Josland received a Judith Meppem scholarship from the Ministry of Health to undertake a study tour in London at the King's College NHS Foundation Trust with their Renal Supportive Care team. She spent the week of November 18th to 22nd observing a clinics, inpatient management, home visits and outpatient management in a nurse led renal supportive care service. This visit gave insight as to challenges faced when a fully nurse led service (supported by nephrologists and palliative care consultants) encompasses a wide geographical area, relies on the dialysis nurses to perform regular symptom surveys with their patients and act on the results, and have close contact with patient GPs to manage their symptoms.

Figure 3: Elizabeth Josland at Kings College Hospital

Performance indicators; plans for 2014

Performance indicators will be identified including a target percentage to aim for. Suggestions for indicators which could be used are:

1. A reduction in total symptom scores within 3 clinic visits.
2. Percent of patients (RSC and selected dialysis patients) with an advance care plan.
3. Percent of patients with a symptom survey and performance scale measured in clinic and for all dialysis patients.
4. Patient satisfaction.
5. Research and publications.

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.

8. HYPERTENSION UNIT REPORT

- 477 Ambulatory Blood Pressure Monitors (ABPM's) were carried out
- 60 of these were for research as part of the P4 study
- 21 were pregnant women
- 57 home monitor checks were attended

RENAL SYMPATHETIC NERVE ABLATION REPORT 2013

RSNA commenced at St George Hospital in 2012 and in 2013 we joined the Global SYMPLICITY Registry (GSR). The GSR aims to collect the identified data on 5000 patients who have undergone renal denervation around the world primarily to look at safety, quality and efficacy. Its outcomes will be reported at major meetings, the outcome of the first 1900 patients have been presented at the American College of Cardiology Meeting in March 2013.

At St George Hospital, patients are referred for renal nerve ablation generally from hypertension clinics and from other consultant physicians including those from Prince of Wales and Wollongong Hospital. Patients undergo a rigorous evaluation prior to consideration, including investigation for secondary causes of hypertension, administration of appropriate anti-hypertensive agents including drugs from the major 5 or 6 drug classes, ideally a therapeutic trial of spironolactone and all patients undergo ambulatory blood pressure monitoring. Patients are not considered to have resistant hypertension unless their 24-hour ABPM studies are abnormal.

By March 2014, 13 patients underwent renal denervation and data from these 13 patients will be analysed during 2014 and presented.

As of March 2014, all patients were discharged in a timely fashion with no short term complications evident, all patients have been compliant with returning for follow up 24-hour APBM studies which have been planned for 3, 6, 12 and 24 months post ablation.

This RSNA although registered in Australia for the treatment of resistant hypertension, remains a procedure with limited data on efficacy and as such its widespread application has yet to be proven beneficial. Accordingly, at St George Hospital in 2014 patients are enrolled only after meeting strict criteria as summarised above.

9. HYPERTENSION IN PREGNANCY (2013)

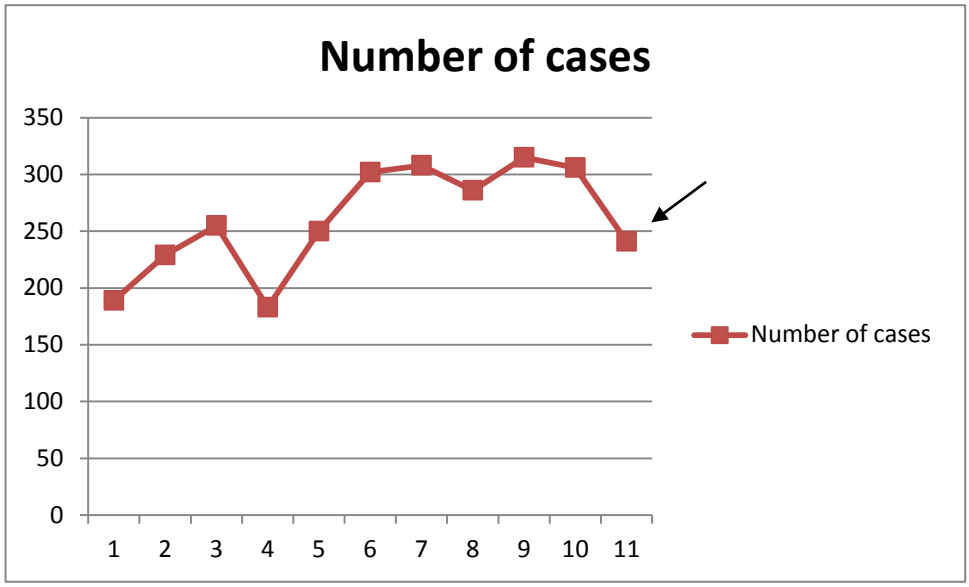
Aims:

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

Activity:

241 consultations to Renal Obstetric Medicine group.

Trend over past 10 years: arrow indicates 2013



Of those, ten pregnancies were not included in the analysis as they were not hypertensive pregnancies – consulted for reasons other than hypertension.

11 of the 231 pregnancies were twin pregnancies and were analysed separately.

A total of 242 babies were delivered.

Of the 220 singleton pregnancies there were;

	N	Severe Htn (%)	Neuro (%)	Anti Con (%)	Eclampsia (%)	Liver (%)	Renal Creat>90 (%)	Platelets <150 (%)	SGA <10% (%)	NICU (%)	PNM	CS rate (%)	<34/40	<37/40
GH	76	9(12)	2(3)	0	0	2(3)	1(1.5)	5(7)	7(9)	0	0	23(30)	0	11(14)
PE	101	31(31)	17(17)	11(11)	2(2)	25(25)	12(12)	17(17)	20(20)	7(7)	0	56(55)	9(9)	20(20)
EH+PE	6	3(50)	3(50)	1(17)	1(17)	2(34)	2(34)	1(17)	0	0	0	5(83)	2(33)	1(17)
EH	21	1(5)	0	0	0	0	0	1(5)	2(10)	0	0	9(43)	1(5)	2(10)
Renal	9	0	1(11)	0	0	1(11)	4(44)	0	0	0	0	3(33)	1(11)	0
WCH	5	0	0	0	0	0	0	0	0	0	0	3(60)	0	0
Renal+PE	2	0	0	0	0	0	1(50)	1(50)	0	0	0	2(100)	1(50)	1(50)

Of the 11 twin pregnancies there were;

	N	Severe Htn (%)	Neuro (%)	Anti Con (%)	Eclampsia (%)	Liver (%)	Renal Creat>90 (%)	Platelets <150 (%)	SGA <10% (%)	NICU (%)	PNM	CS rate (%)	<34/40	<37/40
GH	2/4	0	0	0	0	0	1(50)	1(50)	2(50)	0	0	1(50)	0	2(100)
PE	8/16	3(37.5)	5(63)	3(37.5)	0	1(12.5)	2(25)	3(37.5)	6(37.5)	3(19)	0	5(63)	2(25)	6(75)
EH+PE	0													
EH	1/2	0	0	0	0	0	0	0	0	0	0	1(100)	0	1(100)
Renal	0													
WCH	0													
Renal+PE	0													

GH=gestational hypertension; PE=pre-eclampsia; EH+PE=essential hypertension with superimposed PE; EH=essential hypertension; WCH=white coat hypertension; Renal +PE= renal disease with superimposed PE. Neuro=neurological disturbances; Anti con=anticonvulsant therapy given; SGA=small for gestational age; NICU=Neonatal intensive care unit; PNM= perinatal mortality rate/1000; CS=caesarean section rate. <34/<37 = delivery before these gestations.

There were NO perinatal deaths in this cohort for 2013.

There were no cases of pulmonary oedema and no cases requiring dialysis.

3 Women had an eclamptic seizure.

However CS rates were high, above the expected rate at this centre.

10. ST GEORGE RENAL BIOPSY REVIEW – AUDIT OF COMPLICATIONS

Data for the year 2013

	Total	Transplant biopsies
Number of biopsies	118	50
Total complications	6 (5.1%)	1 (2%)
Macroscopic haematuria	4 (3.3%)	1 (2%)
Symptomatic Perinephric haematoma	2 (1.7%)	0
Transfusion	1 (0.8%)	0

One patient who had gross haematuria following a native kidney biopsy also developed a perinephric haematoma. The only patient who received blood transfusion had a drop in Hb from 109 g/L to 88 g/L post biopsy but did not have gross haematuria or perinephric haematoma

Comparison of total complication rates from previous years

	2006	2007	2008	2009	2010	2011	2012	2013
Total Number	77	58	67	107	85	109	86	118
Complication rate	6%	9%	9%	7.5%	9.4%	10%	7.2%	5.1%

Comparison of specific complication rates expressed as percentage (number)

Year N	2010 N=85	2011 N=109	2012 N=86	2013 N=118	Last 4 years N=398
Total complications	9.4(8)	10(11)	7.2(6)	5.1(6)	7.7(31)
Gross Haematuria, %(n)	4.7(4)	4.6(5)	3.5(3)	3.3(4)	4(16)
Perinephric Haematoma, %(n)	4.7(4)	4.6(5)	3.5(3)	1.7(2)	3.5(14)
Perinephric bleed – angioembolisation, %(n)	0(0)	0(0)	0(0)	0(0)	0(0)
Required blood transfusion	0(0)	1(1)	4.7(4)	0.8(1)	1.5(6)

The complication rates have steadily declined in the last 3 years.

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

- Macroscopic haematuria 3.5% - **met**
- Blood transfusion 1%- **met**
- Angioembolisation 0.6%- **met**

There is no benchmark for symptomatic perinephric haematoma. The other benchmarks were met in 2013 as noted above