

**RENAL DEPARTMENT
ANNUAL REPORT AND
QUALITY INDICATORS
2012**

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Welcome to the 9th Annual report from the Department of Renal Medicine, St. George and Sutherland hospitals, that encompasses activity and clinical outcomes of our work for 2012. Our research and presentations at national and international meetings are published as a separate document. Both documents are available on our website <http://stgrenal.med.unsw.edu.au/>.

I would like to acknowledge the enthusiastic, friendly and dedicated work by everyone in our department, medical, nursing, allied health and administrative, as well as the strong support from hospital management. Together this has facilitated very good outcomes for our patients as documented here, in the midst of increasing workload.

There are many areas to highlight within the eleven sections that comprise this report including the highly organised pre-dialysis program, good patient outcomes for our dialysis patients, great improvements in vascular access and an ever decreasing rate of infections. We can be proud of the high proportion of our dialysis patients now managed at home, which facilitates better lifestyle at a difficult time of their life.

The renal supportive care program continues to expand, allowing much better care for patients on a non-dialysis pathway with greater support also for their families.

Our biggest growth area has been in transplantation, with more patients being transplanted than at any previous time. This is the best outcome for our patients with end stage kidney disease and we are pleased that our patient and transplant graft survivals remain very good.

This report allows us to be reassured that we are meeting benchmarks for the majority of outcome measures; at the same time it has highlighted for us some areas where improvements can be made and we have developed plans accordingly.

Finally, our department continues its strong involvement in education at all undergraduate and postgraduate levels. We are very grateful to the companies that have supported our education throughout 2012, listed at the end of this document.

Prof. Mark Brown

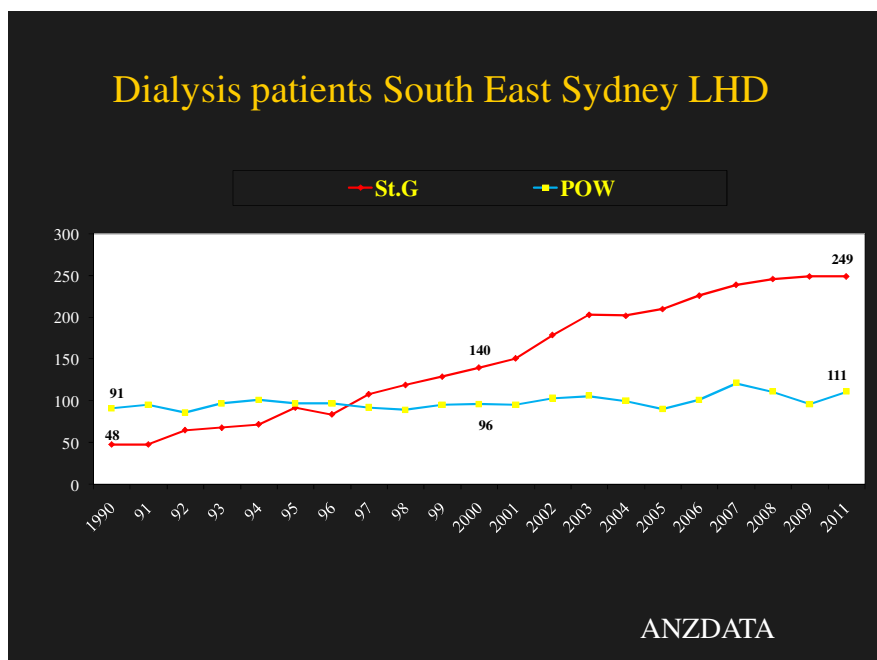
Director, Dept Renal Medicine

SECTION 1: WORKLOAD MEASURES AND EXECUTIVE SUMMARY.

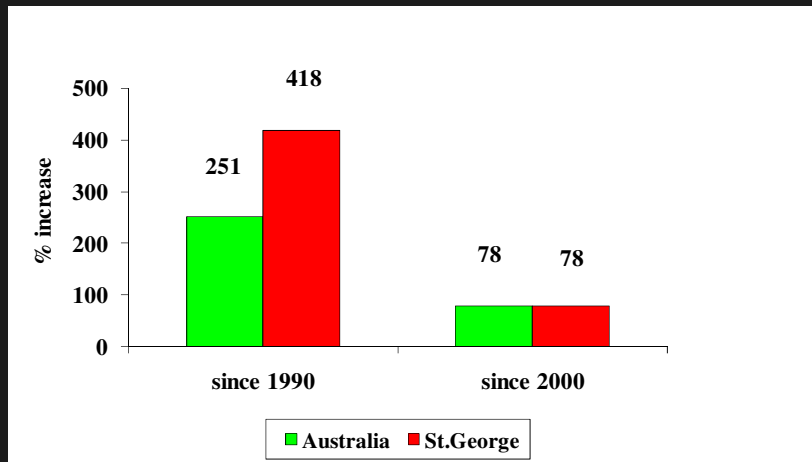
Workload – clinic, dialysis and transplant patients

- In 2011-12, Clinic attendances increased to 6569, an average of 126 patients per week
 - This is an increase of 7.5% from 2010-11
 - This does not account for the vast amount of nephrology work done in the private sector (probably twice that done in clinics) by nephrologists at St George hospital, without which it would not be possible to see patients within a reasonable time frame nor maintain ongoing follow up in the available clinic space.
- 17,817 in-centre dialyses were performed, a 2.8% drop from the previous year which is a good outcome reflecting better preparation for dialysis patients for home dialysis modalities and appropriate use of the Renal Supportive care program in helping to select better which patients will benefit from in-centre dialysis.
- **41% of our dialysis population is on home dialysis, above the National average**

The data below are taken from the most recent ANZDATA report which captures dialysis and transplant workload as at Dec 31st 2011.

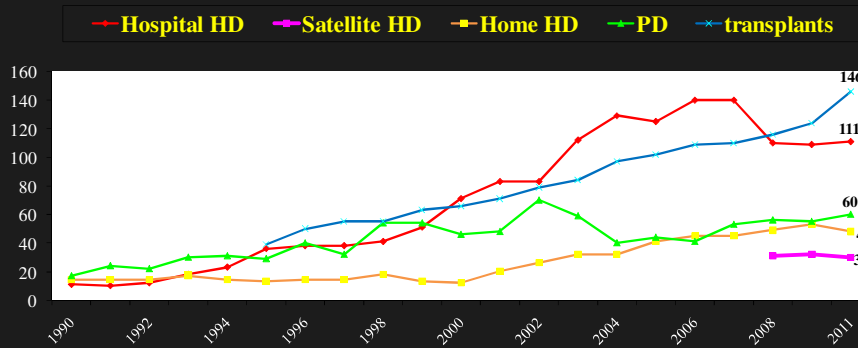


Growth in dialysis patients



ANZDATA 31/12/09

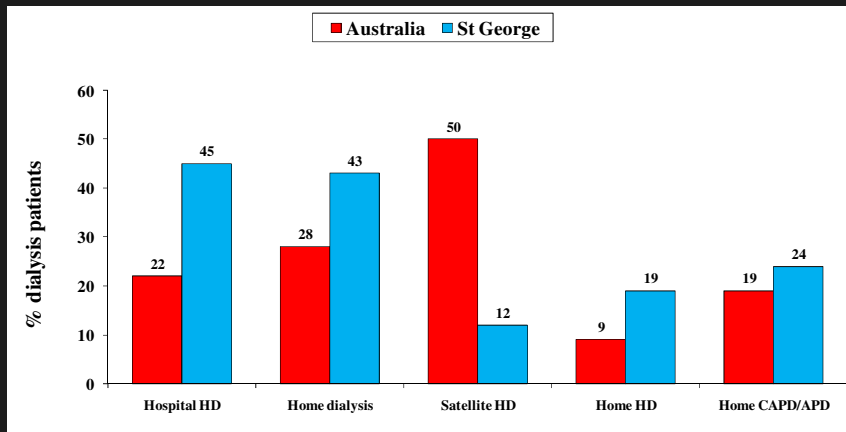
Dialysis & transplant patients St. George hospital 1990-2011



NB. Hospital HD includes potential satellite patients until 2008

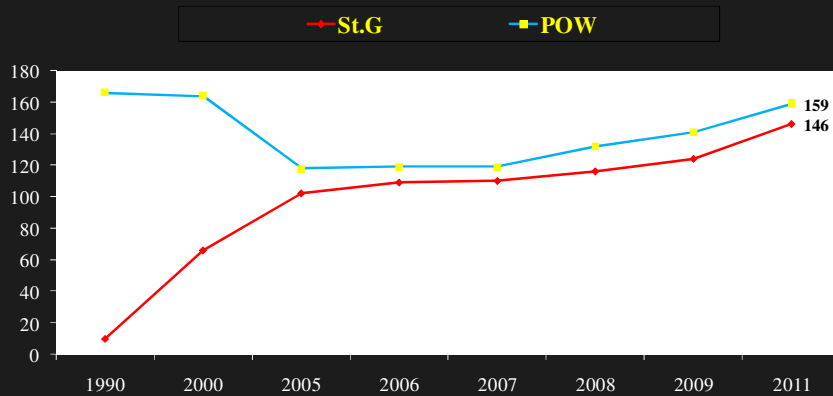
ANZDATA 31/12/11

Mode of dialysis Australia & St.George 2011



ANZDATA 31/12/2011

Functioning Transplants South East Sydney LHD



ANZDATA

New patients starting dialysis

- 39 commenced 2012 (11 PD, 28 HD); only 4 late referrals
- 65% overweight or obese
- Over the years 2010-2012:
 - **HD patients slightly older than national average**
 - PD patients similar age
 - About 75% started at eGFR <10
 - **Fewer co-morbidities than national average**
 - except DM more common in our HD population
 - **Fewer late referrals than Nationally**

Pre-Dialysis

- 93 new patients and 97 follow up patients attended pre-dialysis clinic 2012
- 148 are on the active pre-dialysis pathway:
 - 40% planned for PD, 15% home HD, 13% hospital HD, 10% satellite HD
 - 9% planned for pre-emptive transplantation
 - 12% undecided which pathway
- Malnutrition is high
 - About half of planned hospital HD
 - 2/3 renal supportive care patients
 - 1/3 of PD and home HD patients
- We are meeting benchmarks for:
 - Majority of patients start their planned modality
 - Majority have had pre-dialysis education (87%), excluding late referrals
 - Most have had Hep B vax pre-dialysis (68%)
- Not meeting benchmark for timely referral:
 - Only 2/3 referred at GFR above 15
- **The implications of these data are:**
 - Earlier referrals needed, with nutrition support as a routine
 - Resources need be directed to PD and maintaining patients on this pathway
 - Every case of planned hospital HD needs ongoing review to limit numbers on this pathway
 - Every case 'undecided' needs ongoing review to ensure proper access creation

Hemodialysis

- There was a fall in the number of hemodialysis procedures (3%) from the previous year, for only the 2nd time in the past 12 years; this likely relates to the increased uptake of PD as a preferred modality.
- ***Patient and technique survival are at or slightly above the National average***
- Targets for Calcium, phosphate, dialysis adequacy and iron management were achieved above the National average
- Half our HD patients have diabetes – 2/3 have good control
- ***Implications of these data***
 - Overall the outcomes for these patients are as good as expected, particularly as patients are slightly older than national average
 - Improvements in survival likely best achieved through optimum selection of patients for HD as a modality of treatment
 - Closer attention to diabetes control is needed
 - To be flagged at 3 monthly blood review for in-hospital and satellite HD patients

Vascular Access

- We have now achieved ***59% of patients having a functioning fistula at entry to dialysis compared with 43% ANZDATA national average***
- Reasons for lack of access in other patients included late referrals, unexpected acute deterioration in renal function, planned pre-emptive transplantation or patient ambivalence about having access creation.
- ***84% of our HD population have a native AVF, above the national average 76%***
- BSI rates are very low (0.07-0.59/100 pt months), well below accepted rates
- Median AVF survival is above 6 yrs and AVG above 2.5 yrs;
 - 2/3 meet the target of AVF lasting above 3 yrs and 45% for AVG lasting >2 years.
- Central access use is slowly falling and infection rates are very low.
- Implications of these data:
 - Through the VAN and better co-ordination with our surgeons, vascular access surveillance has increased markedly over the past few years and has led to very good outcomes in primary access rates, infection rates and long term fistula survival
 - A focus can now be on:
 - improving primary access rates even further, and
 - Increasing the % of patients with long term AVF and AVG survival
 - Reducing the number of central line access that is required

Peritoneal Dialysis

- Patient survival similar to the National average (46% at 5 yrs)
- Technique survival remains poor at a world-wide level (our data 14% at 5 years is good but less than national average in 1st 3 years); 95% of our patients use APD.
- Less than 20% now have to change modalities to HD, better than the national average
- Targets for iron management were achieved but calcium and phosphate management was not as good as the National average (45 vs. 60%)
- Hb targets were not met (about 45% in range)
- About half the diabetics have suboptimal HbA1c
- Peritonitis infection rates continue to fall with the past 3 years achieving an average of 1 case per 55 patient months, well above national average.
- **Implications of these data:**
 - With increasing uptake of PD in our Unit we need to address better technique survival in the 1st 3 years; this is likely to be assisted by the very low infection rates
 - Greater attention to monthly and 3 monthly blood results may help improve calcium, diabetes and Hb management

Quality of life

- QOL in dialysis patients has improved for physical functioning over the past decade, possibly attributed to the renal supportive care program as there have been no changes in other dialysis or nutrition parameters over this time
- This has occurred despite the patients being slightly older and many more having diabetes
- With the exception of pain and mental health, patients on a non-dialysis pathway have worse QOL measures overall than those on dialysis
- Transplant patients have QOL almost as good as the normal population
- Implications of these data:
 - Improving QOL is a hard task
 - Our attention should be focussed on our dialysis patients over 65 and those on a non-dialysis pathway as these are the groups with the worst QOL
 - Perhaps greater involvement of social work and the RSC might help

Transplantation

- 20 patients received a kidney transplant in 2012, **our highest ever rate**
 - 19 kidney only, 1 kidney/pancreas
 - 5 live donors (25%), 15 deceased donors
- We are caring for 164 chronic transplant patients
- For deceased donor transplants:
 - **patient survival is similar to the National average**
 - 95 vs. 97% 1year, 86 vs. 89% at 5 years (**St George vs. Australia**)
 - **Graft survival is similar to the National average**
 - 90 vs. 93% 1 year, both 81% at 5 years
- For live donor transplants:
 - **patient survival is similar to the National average**
 - 100 vs. 99% 1year, 96 vs. 95% at 5 years
 - **Graft survival is similar to the National average**
 - 97 for both at 1 year, both 89% at 5 years
- Over the past 4 years 56% of potential donors have been found medically unsuitable and 10% have had a change of mind; in 2012 five live donor transplants proceeded.
- Patient deaths from 2006-2011 were 11% of those transplanted in that time vs. 5% for the National data
- Acute rejection rates in the first 12 months remain low, at 16%
- 73% of ongoing transplants have a serum creatinine ≤ 150 umol/L
- 67% (of 137 patients with measurement) had P/Cr < 30 mg/mmol
- 6% had BK viremia and 2% BKVAN (from the 60 of 164 patients tested)
- Almost 80% have treated hypertension, 20% ischemic heart disease and 30% cancer
- 30% have NODAT or prior Type 2 diabetes
- Approximately 80% receive steroids, 75% a CNI and 10% an MToR agent
- **57 (23%) dialysis patients are on the transplant waiting list**
 - 63% of those in the 25-64 age group are on the waiting list and the remainder have a medical reason for not being transplanted or are in work up.
- **Implications of these data:**
 - Overall short term and long term outcomes are good and we can reassure our patients accordingly
 - We plan a more detailed analysis of surgical outcomes
 - We plan to discuss every transplant patient death and every case where there is a significant (20%) loss of GFR from the 3month time or from the previous year

Renal Supportive Care

- The Renal Supportive Care program has been in place almost 4 years;
 - staff from many Renal Units have visited our department to learn about the program;
 - the program has received several awards.
- 198 patients have attended the clinic, about 2/3 on a non-dialysis pathway
- Symptom burden is high
- More detailed analyses of survival, QOL, symptom control and patient and family satisfaction will be undertaken during 2013.

Hypertension Unit & Obstetric Medicine

- We introduced the technique of Renal Sympathetic Nerve Ablation for treatment of resistant hypertension and have joined the International registry to monitor outcomes
- The Unit managed 224 women with hypertension in pregnancy, 75% of all cases
- Pregnancy outcomes were excellent
 - for mothers (only 1 case of eclampsia, 0.3%, and no dialysis or pulmonary edema for pre-eclampsia)
 - for babies (overall perinatal mortality rate 9/1000 which is similar to the National rate for all pregnancies).

Renal Biopsy

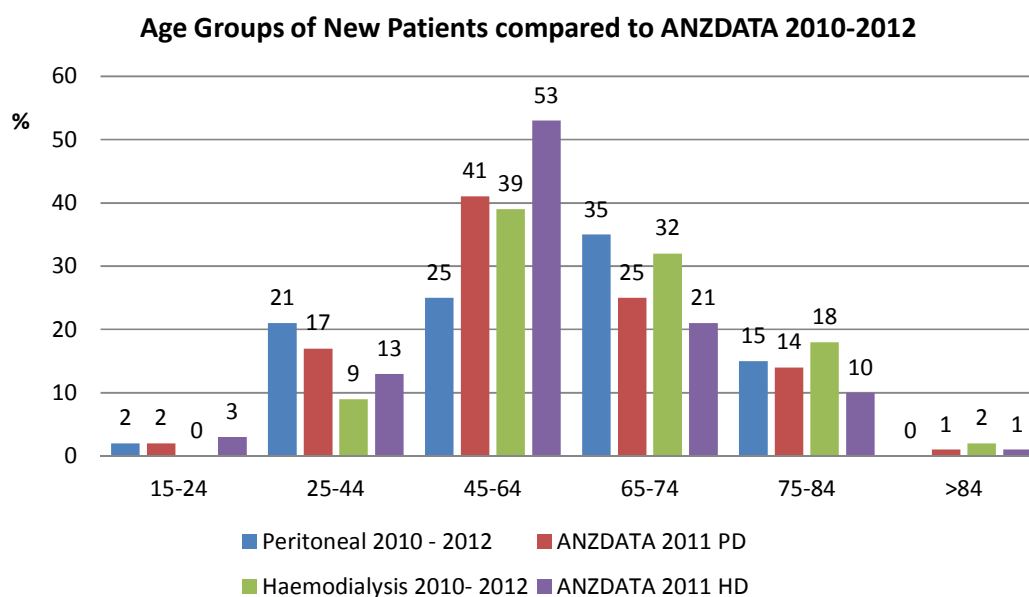
- 86 biopsies were performed with 7% complications (macroscopic hematuria 3.5%, symptomatic perinephric hematoma 3.5%), similar to international literature
 - This represents a slowly improving complication rate
 - We are meeting international benchmarks except for need for transfusion
 - A department review has not unearthed any new changes needed for the procedure
 - This reinforces our prior review to keep patients in hospital overnight post-transplant for close observation
 - There were no complications in transplant biopsies

Acceptance onto dialysis

Out of 39 new patients who started dialysis in 2012, 11 patients commenced peritoneal dialysis (PD) and 28 haemodialysis (HD). Patients are analysed according to their first mode of dialysis only.

- There were only two late referral for PD (20%) and two for HD (7%), slightly better than for the National average.
- Mean age at commencement of PD was 57 years in 2012 and for HD 62 years. This was younger than 2011 (63 and 65yrs respectively).
- St George tends to dialyse more younger patients by PD than HD compared with the national average; given the very good patient outcomes for this group this seems an appropriate result.

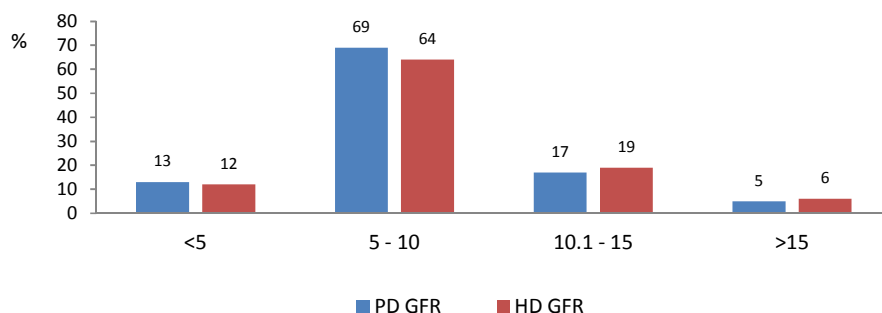
Age group of new patients.



Glomerular Filtration rate (eGFR)

An e GFR is obtained from the biochemistry blood serum results taken immediately prior to commencing dialysis.

Peritoneal Dialysis and Haemodialysis eGFR (MDRD) 2010 - 2012



Baseline Characteristics of new dialysis patients

St George Hospital new patients	PD 2010 - 2012	HD 2010 - 2012	
Body Mass Index	<20	4	5
(kg/m)	20-24	29	31
	25-30	33	20
	>30	33	44

Higher BMI is associated with higher rates of technique failure and death in Australia and New Zealand. (ANZDATA Registry 2004 Report: Pg 60) **BMI <20 indicates underweight, 20-25 normal, 26-30 overweight and >30 is obese.** *Excludes patients who had haemodialysis prior to peritoneal dialysis.

		St George Haemodialysis 10-12 (n=87*)	HD ANZDATA 2011 (n=1666)	St George Peritoneal dialysis 10-12 (n=48*)	PD ANZDATA 2011 (n=467)
Age	(Average age in years)	64.8	60.7 [†]	59.7	60.7 [†]
Gender	Male	61%	63% [†]	69%	63% [†]
	Female	39%	37% [†]	31%	37% [†]
Late Referral	(< 3 months before first treatment)	20%	22% [†]	15%	22% [†]
Co-morbidities	Smoking (Current and former)	51%	55%	42%	50%
	Chronic Lung Disease (yes and suspected)	10%	20%	0%	14%
	Cerebrovascular Disease	8%	16%	9%	12%
	Coronary Artery Disease	42%	47%	32%	33%
	Peripheral Vascular Disease	19%	30%	11%	21%
	Diabetes	55%	49%	39%	41%

*Excludes patients who had previous mode of dialysis. [†]Total dialysis population (Hd + PD) ANZDATA 2011

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 dialysis.

Overview

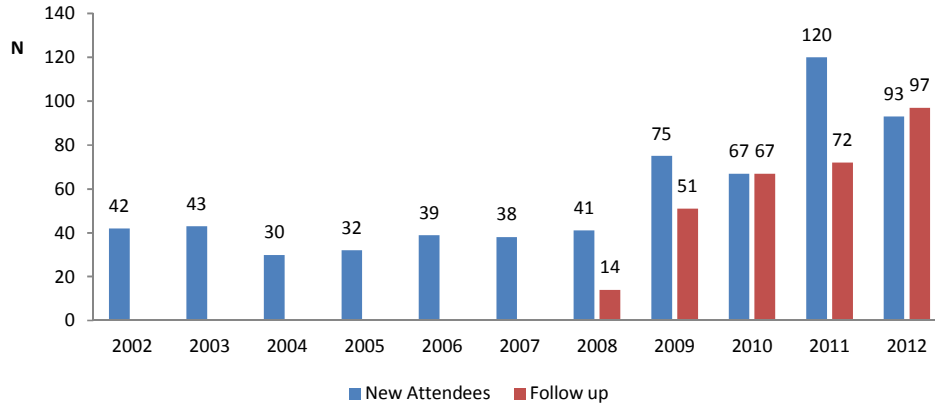
The Renal Department guideline for referral to the multidisciplinary Predialysis Clinic is Creatinine >300, and/or eGFR < 25. Generally, nephrologists will have considered these patients as suitable for dialysis. As of December 31st 2012, there were 148 patients on the Predialysis Program spreadsheet with an active plan for renal replacement therapy.

April 2012 marked the 10 year anniversary of the formal predialysis program. The Predialysis Clinic has been operating since April 2002 and in total there have been 620 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. Once patients attend the clinic their progress and outcomes are tracked and initiation of vascular access planning or pre PD assessment conducted when indicated.

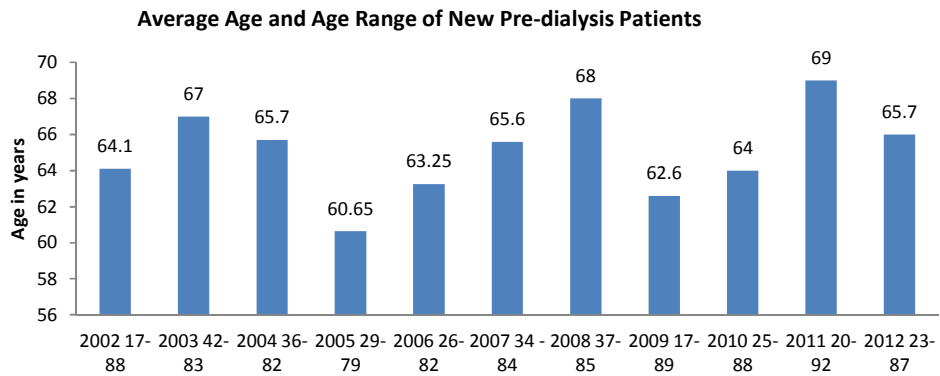
Clinic activity

93 new patients attended clinic in 2012 compared to 120 new attendees in 2011. There were 97 follow up appointments compared to 72 follow up appointments in 2011. 2011 data included patients seen for dialysis options education as inpatients. The inpatient education sessions have been excluded from this report as they do not reflect the activity of the Predialysis Clinic. 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.

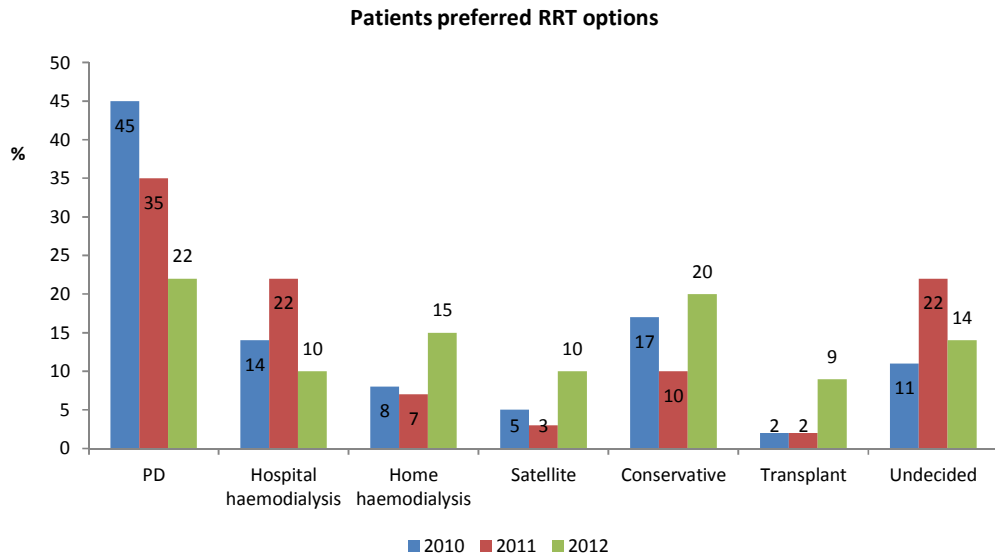
Attendances in Pre Dialysis clinic



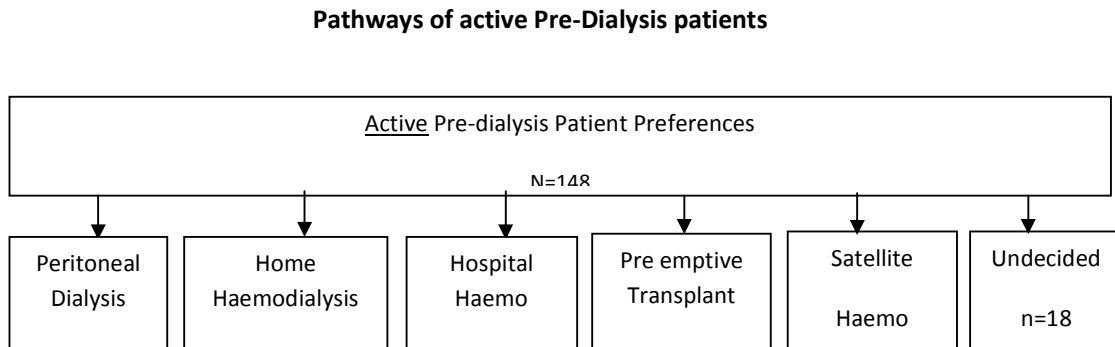
Yearly new attendees and follow up since inception in 2002



Average age of pre-dialysis education new attendees



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



Patient Satisfaction

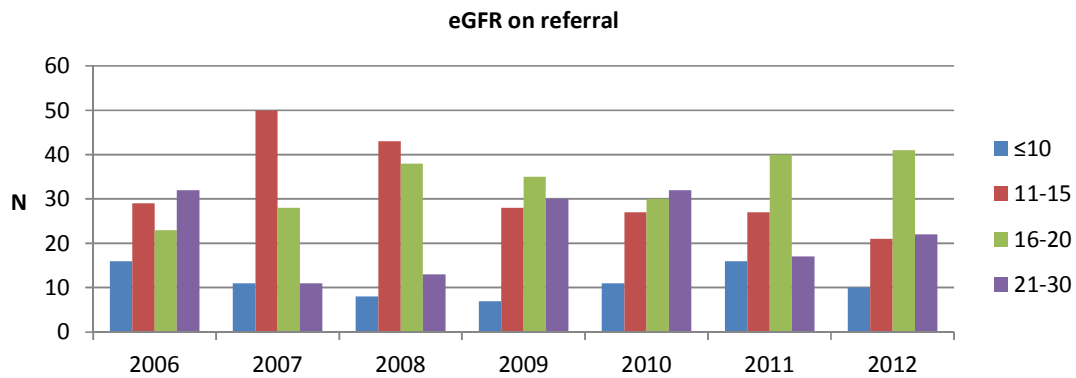
There were 38 patient satisfaction survey returns for 2012 with an average score of 22.5/24 (93.8% satisfaction). This included evaluation for timely appointment, helpful staff, waiting time, comprehensive assessment, left with a good understanding and a personal rate of satisfaction.

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 > 15-20



eGFR for new patients on referral for pre dialysis education

In 2012, 23% patients were referred with an eGFR >20 and 63% had an eGFR > 15-20 which shows an improvement from 2011 in which 17% had an eGFR >20 and 57% had an eGFR 15-20 on referral for pre dialysis education.

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

For patients commencing dialysis in 2012 all planned modalities surpassed 70% benchmark.

Peritoneal dialysis	100%
Home haemodialysis	80% (4/5 with one starting in satellite and another transferring to satellite after failing to train)
Hospital and satellite haemodialysis	77%

Two patients who started hospital haemodialysis were for the conservative pathway as first choice. Two patients who chose pre-emptive transplant commenced hospital haemodialysis. Transplantation targets are not relevant to this analysis.

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 28 end stage CKD patients who commenced haemodialysis in 2012, 26 had attended Predialysis Clinic (92%) which is a marked improvement from 2011 where 30% of the new starts received education immediately prior to starting treatment. Of the 11 new peritoneal dialysis patients, eight had attended clinic (72%).

87% of new dialysis patients (excluding acute dialysis and late referrals) had pre-dialysis education \geq 3 months before dialysis commencement.

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.

68% of patients who had been through the Predialysis Clinic and commenced dialysis in 2012 had completed a course of hepatitis B vaccinations.

Summary of Benchmarking

1. Improvements in all benchmarks in 2012.
2. Three of the four benchmarks were met; the department will discuss the relevance and setting of these benchmarks for 2013.

Evaluation of nutrition in the multi-disciplinary pre-dialysis assessment clinic

Maria Chan

(The change of clinical and nutritional characteristics, and RRT preferences of patients at enrolment to the pre-dialysis assessment clinic over a ten-year study period - 2002 to 2012)

Aim: Comparison of clinical and nutritional characteristics, RRT preferences of patients enrolled in a pre-dialysis assessment clinic over two 5-year periods, from April 2002 to March 2007 vs. from April 2007 to March 2012.

Methods: retrospective data audit

Results: 501 of 520 patients who attended the outpatient pre-dialysis clinic had reliable nutrition records for analysis.

Table 1 Comparison of demographic, clinical and nutritional parameters over the two 5-year study periods

Parameters (<i>n missing</i>)	Time period		P value
	4/2002 to 3/ 2007	4/2007 to 3/ 2012	
Number	n =176	n =325	
Demographics			
Age (year)	65.2±13.8	66.4±15.2	0.39
Clinical and co-morbidities			
GFR _{CG} (mL/min/1.73m ²), (<i>n =18</i>)	16.7±6.7	22.1±9.1	<0.0001
CKD stage 5 (%), (<i>n =18</i>)	41.4	23.0	<0.0001
Coronary artery disease (%), (<i>n =1</i>)	36.6	31.7	0.27
Diabetes mellitus (%)	33.0	51.4	<0.0001
Cause of ESKD			
Chronic glomerulonephritis (%)	18.8	10.2	0.007

Diabetic nephropathy (%)	20.5	33.2	0.003
Nutritional parameters			
s-albumin < reference range (%),(n =11)	37.4	29.7	0.09
BMI (kg/m ²), (n =17)	28.1±5.9	29.6±6.8	0.01
BMI >26 kg/m ² (%),(n =17)	61.7	68.0	0.16
BMI >30 kg/m ² (%),(n =17)	32.0	44.7	0.01
Malnutrition (SGA B or C) (%),(n =61)	39.7	42.0	0.64

Key findings:

- The number of patients attending the clinic has doubled over the 2 study periods. A significant increase in the prevalence of obesity and diabetes over the 10-year study period was observed, paralleled to the obesity and diabetes epidemics in the general population.
- Despite patients being enrolled in the clinic earlier or at a high level of GFR, the prevalence of malnutrition remained high. There was no statistical difference between the prevalence of malnutrition between the two periods.

Table 2 Comparison of patients' initial choice for future RRT treatment over the two 5-year study periods

Study period	No-RRT	Renal replacement program (RRT)				Others (Unsure)
		Home dialysis		Hospital HD	Early TP	
		PD	HD			
% total n =501	14.8	47.7	13.6	18.2	3.8	1.9
4/2002 to 3/2007 (n =176)	15.3	39.2	21.0	19.3	3.4	1.8
4/2007 to 3/2012 (n =325)	14.5	52.3	9.5	17.5	4.0	2.2
<i>P</i> value*	0.79	0.01	<0.0001	0.62	0.74	0.73

* *P* value between the two 5-year study periods of 4/2002 to 3/2007 and 8/2007 to 3/2012

Abbreviation: RRT = renal replacement therapy; PD = peritoneal dialysis; HD = haemodialysis; TP = transplant

Table 3 Demographic, clinical and nutritional factors associated with future choice of RRT or conservative care (no-RRT)

n =501 (n missing)	No-RRT	Renal replacement program (RRT)				Others (unsure)	P value*
		PD	Home HD	Hospital HD	Early TP		
n (% total)	74 (14.8)	239 (47.7)	68 (13.6)	91 (18.2)	19 (3.8)	10 (1.9)	-
Age (yr)	77.3±7.0 [†]	65.6±14.3	58.6±12.7	68.6±11.5	41.1±16.3	68.3±14.7	n/a
Age >65 yr (%)	91.9 [†]	61.5	32.4	73.6	5.3	60.0	<0.0001
Age >75 yr (%)	71.6 [†]	27.2	5.9	28.6	0.0	60.0	<0.0001
Gender (% male)	55.4	63.6	61.8	54.9	47.4	70.0	0.46
GFR (mL/min/1.73m ²) (n =18)	17.5±8.4 [‡]	20.3±8.8	21.2±6.6	19.7±7.2	29.7±13.1	18.9±7.6	n/a
CKD stage 5 (%) (n =18)	42.3	30.3	16.4	29.9	11.1	44.4	0.01
CAD (%) (n =18)	35.6	32.2	17.6	49.5	10.5	50	<0.0001
DM (%)	47.3	46.4	26.5	60.4	10.5	40	<0.0001
BMI (kg/m ²) (n =18)	28.1±5.9	28.7±6.1	30.1±8.3	30.2±6.8	29.2±6.0	27.0±4.9	n/a
s-alb < ref. (%) (n =17)	37.5	31.3	25.4	40.0	15.8	33.3	0.20
Malnourished (%) (n =62)	64.6*	34.3	27.7	51.9	33.3	42.9	<0.0001

Abbreviation: GFR = glomerular filtration rate in mL/min/1.73m²; s-alb = serum albumin

no-RRT group vs. the combined RRT group (PD + home HD, Hospital PD and early transplant)

*P value for categorical variables, [†]P <0.0001, [‡]P=0.004

Key findings (see Tables 2 and 3):

- Preferences for the future treatment options changed significantly over time (P =0.008).
- Preference for home dialysis therapy (PD and home HD) remained high, with PD becoming the first choice; this was accompanied by a downward shift of preference to home HD.
- The proportion of patients preferring conservative management and hospital dialysis remained stable; they were of higher dependence, more advanced in age, have a higher prevalence of co-morbidities and nutrition abnormalities.

Conclusion:

We observed a high prevalence of and an increase in the total number of nutrition abnormalities in people attending the pre-dialysis clinic. In view of high nutrition risk, early structured nutrition intervention is required in these patients irrespective of whether a conservative or RRT pathway is chosen.

Haemodialysis

St George Hospital (STG) operates a 34 chair haemodialysis service with an average 113 patients dialysed per month. In the 2011-2012 financial year there were 17,817 separations, a 2.8% decrease from the 2010-2011 financial year.

The Satellite service at Sutherland Hospital operates nine chairs servicing low care patients. In the 2011-2012 financial year there were 4,651 separations a 3.6% decrease from the 2010-2011 financial year.

Home haemodialysis training continued at St George with 6 patients during the 2011-2012 financial year and 47 patients in total. Respite dialysis was utilised more than previous years with 71 sessions.

41% of our patients are on home dialysis therapies.

Table 1: Distributions of dialysis modalities

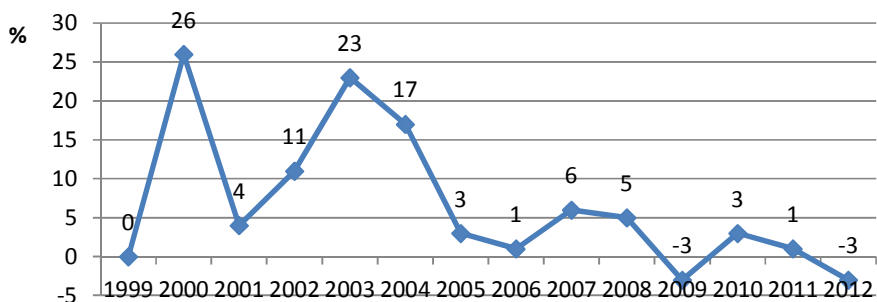
Dialysis modalities	n	%
PD	55	22 [#]
Home Dialysis	47	19 [#]
Satellite	32	13
In-centre	113	46
Total	247	

[#] Home Therapies

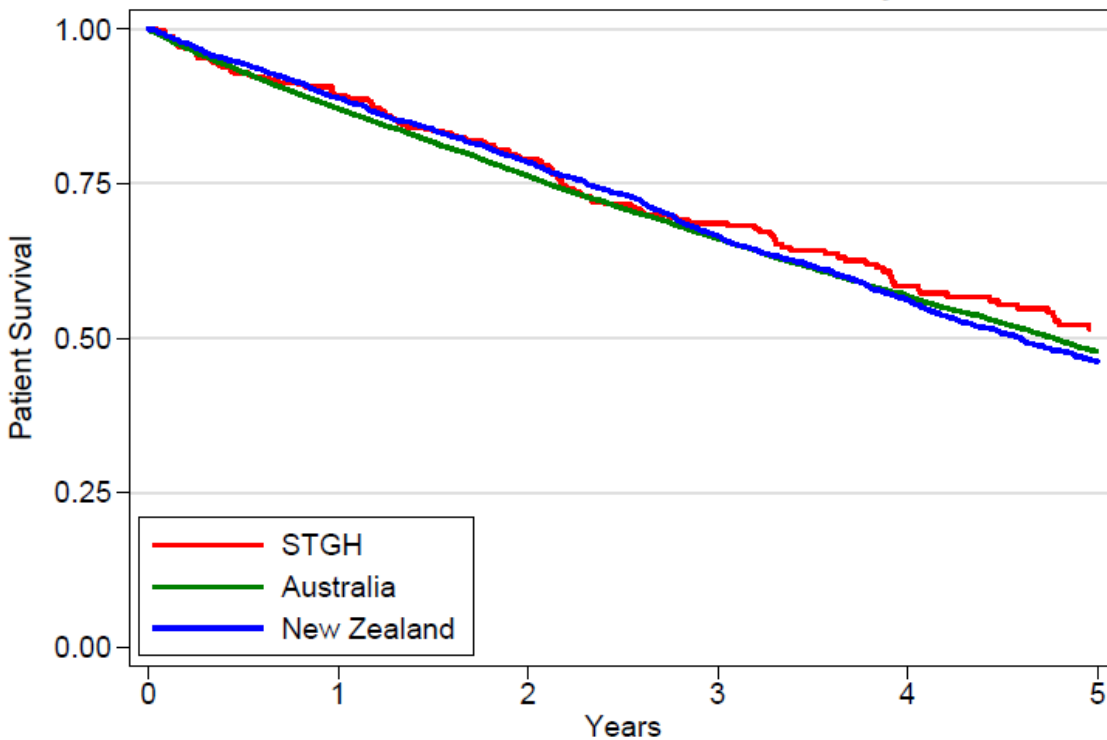
Activity

Activity has dropped by 3% between the two sites from 23,157 sessions in 2011 to 22,468 in 2012 (in-centre and satellite). The graph below shows the annual percentage change in in-centre and satellite dialysis episodes over the past 14 years.

Yearly St George and Sutherland Haemodialysis Growth



Patient Survival – HD at 90 days



Data supplied by ANZDATA for 2000-2011

Table 11: HD patient survival

Time	STGH		Australia	
	n	% Survival (95% CI)	n	% Survival (95% CI)
0	351	100.0	15933	100.0
3 months	321	96.5 (93.9-98.0)	14644	96.2 (95.9-96.5)
6 months	302	92.9 (89.6-95.2)	13552	93.0 (92.6-93.4)
1 year	266	89.3 (85.4-92.2)	11622	87.1 (86.6-87.7)
2 years	206	79.0 (74.0-83.2)	8473	76.3 (75.5-77.0)
3 years	149	68.7 (62.8-73.8)	6055	66.1 (65.3-67.0)
4 years	101	58.5 (51.9-64.5)	4203	56.9 (55.9-57.8)
5 years	76	51.5 (44.5-58.0)	2794	47.9 (46.8-48.9)

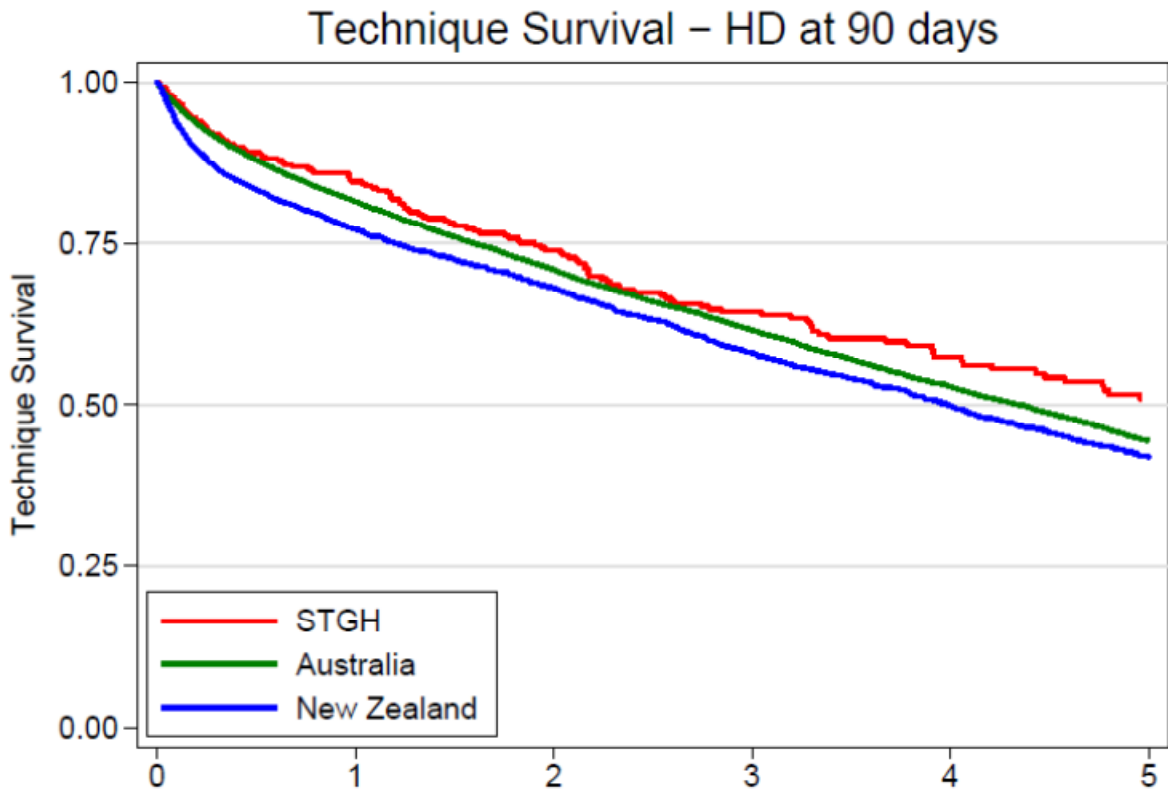


Table 12: HD technique survival

Time	STGH		Australia	
	n	% Survival (95% CI)	n	% Survival (95% CI)
0	351	100.0	15933	100.0
3 months	309	93.0 (89.8-95.3)	14053	92.4 (92.0-92.8)
6 months	290	89.1 (85.3-92.0)	12790	88.0 (87.4-88.5)
1 year	251	84.6 (80.2-88.1)	10829	81.5 (80.9-82.1)
2 years	191	74.0 (68.6-78.5)	7832	70.9 (70.2-71.7)
3 years	138	64.3 (58.4-69.7)	5598	61.6 (60.7-62.4)
4 years	97	57.4 (50.9-63.3)	3878	52.8 (51.9-53.8)
5 years	74	50.9 (44.1-57.4)	2579	44.5 (43.4-45.5)

Background and Activity Level

- Routine monthly bloods are attended on haemodialysis patients as per our existing monthly protocol.
- Blood results were audited in April and October each year for chronic in-centre and satellite haemodialysis patients.
- Lipid target range is set by the National Heart Foundation (National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand 2005) for high risk patients.

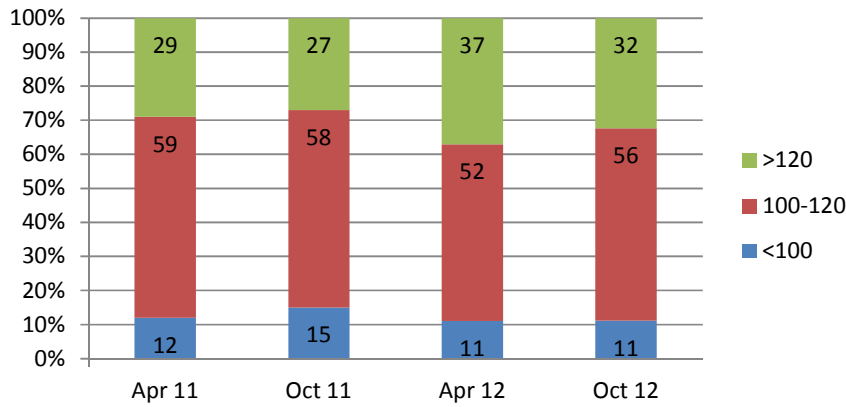
Parameter	Target	Apr 11	Oct 11	Apr 12	Oct 12	ANZDATA 11
Ca	2.25-2.58 mmol/L	65	59	64	51	-
Corr Ca	2.1-2.4 mol/L	31	40	42	54	-
PO4	0.8-1.6 mmol/L	55	62	64	65	-
CaPO ₄	<4.0 mmol/L	62	70	74	70	67
Ferritin	200-800 ug/L	72	74	75	67	60
Fe Sats	20-50%	76	72	73	64	-
Albumin	33-48 g/L	72	66	71	54	-
KT/V	≥ 1.2	95	96	93	98	-
URR	>65%	94	95	91	97	92

Haemoglobin

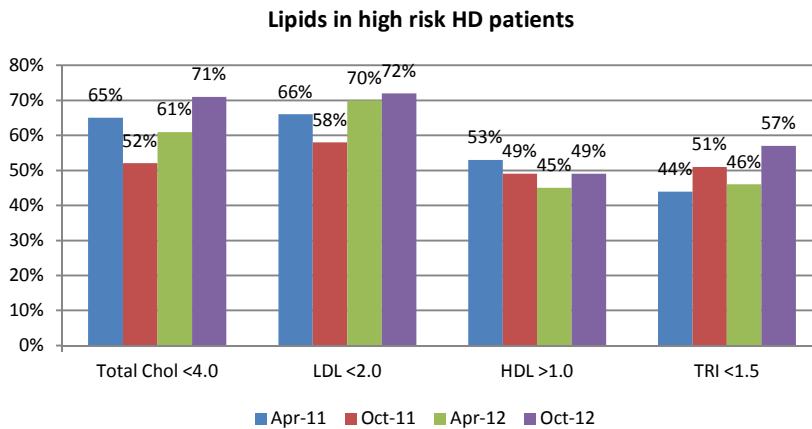
Targets are the same as for PD patients.

- .
- Overall, 56% of patients had the desired haemoglobin; this is slightly reduced from the October 2011 results.
- In October 2012, 56% of haemodialysis patients had a haemoglobin between 100-120g/L.

Haemoglobin

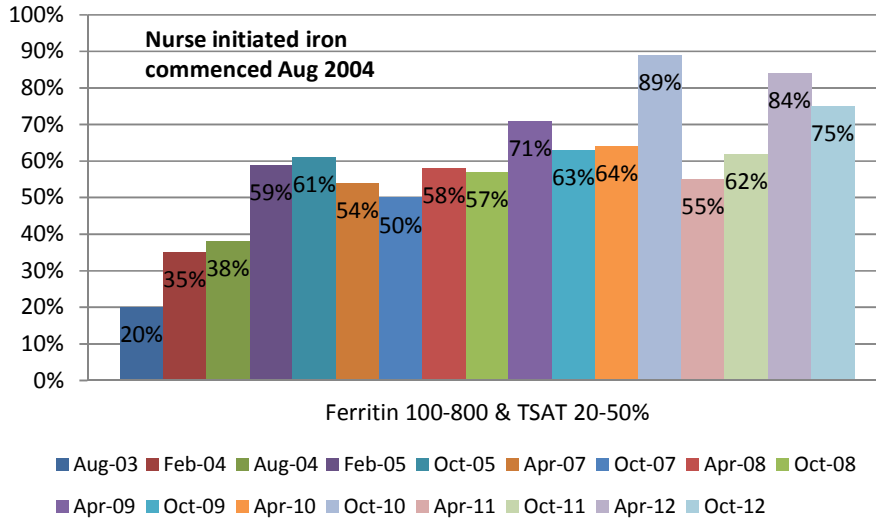


Lipids for high risk haemodialysis patients

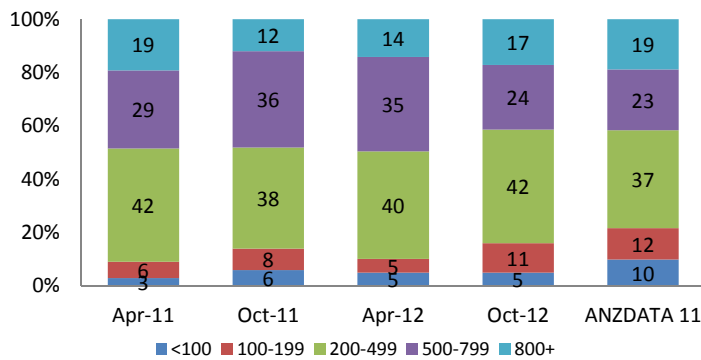


- Ranges are recommended by the 2005 national heart foundation (National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand 2005).
- 71% of high risk haemodialysis patients had total cholesterol <4 in October 2012 compared to 52% in October 2011. There are no statistically significant changes over this time period in any lipid result.
- Data are collected only on patients with, or suspected of having, coronary artery disease, peripheral vascular disease, cerebrovascular disease or diabetes.

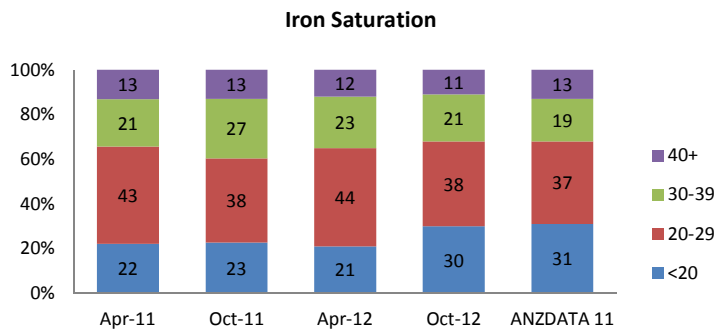
Total Iron studies



Ferritin



Transferrin saturation

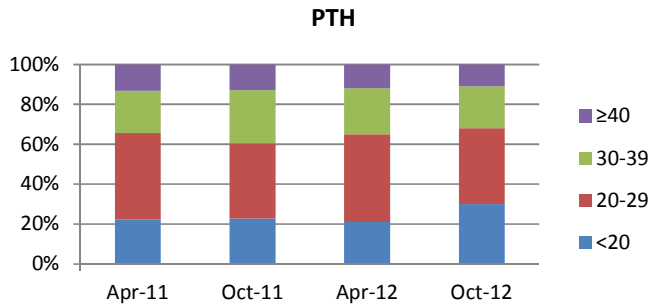


Ferritin, Transferrin Saturation and Total Iron Studies

- Seventy five percent (75%) of all patients in October 2012 were iron replete compared to 62% in October 2011..
- 77% patients have Ferritin level within the normal range of 100-800 in October 2012 compared to ANZDATA 2011 (72%).

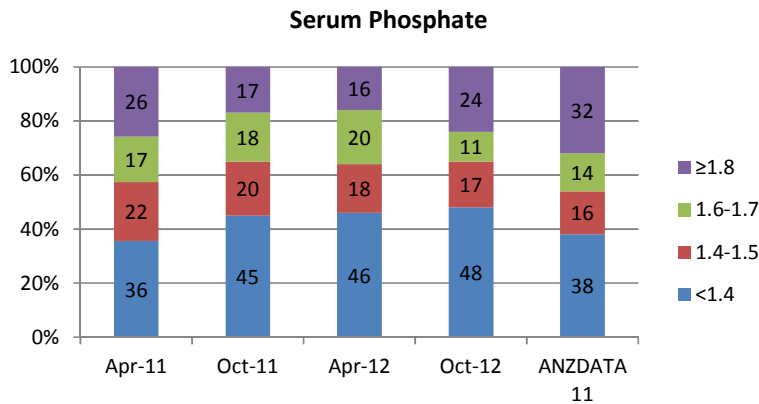
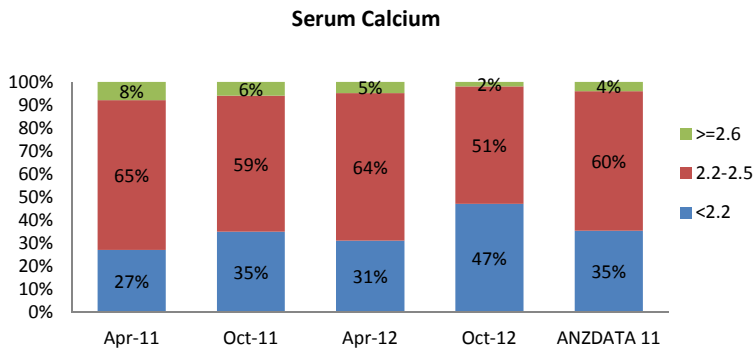
- Transferrin Saturation results show no statistically significant changes over the audit period. Results match the ANZDATA benchmark.

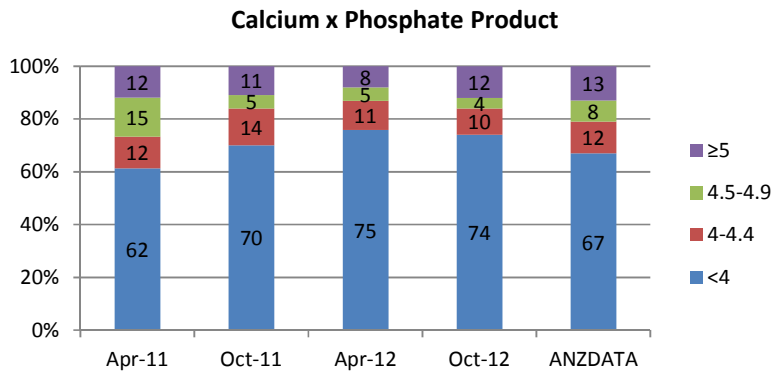
PTH



There is no statistically significant change in PTH results over the audit period. October 2012 had an increase in the percent of patients with a PTH <20.

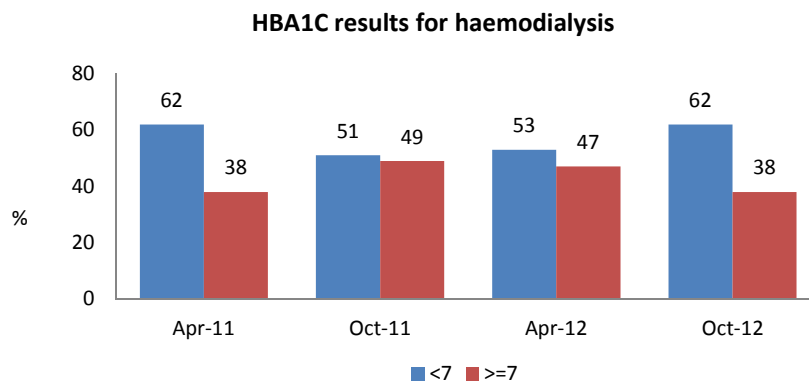
Serum Calcium, Phosphate & CaPO⁴ product





- 74% met the Calcium-phosphate product <4 mmol/L that is recommended by the CARI guideline, slightly better than the national ANZDATA results.

*Twenty four percent of patients had a serum phosphate level ≥ 1.8 , slightly better than that of ANZDATA 2011 32%. **HBA1C***



- 73/137 (53%) of our HD patients had diabetes as at the October 2012 audit. Two-thirds met the target of good glycaemic control.

Dialysis Adequacy

- Dialysis adequacy remains similar to the ANZDATA haemodialysis results for URR with 92% of Australian patients reporting a URR >65%.

Summary

- The unit continued to achieve better than national results in most outcome targets.
- Improvements need to be achieved to ensure better diabetes control.

VASCULAR ACCESS

Background and Activity level:

- 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

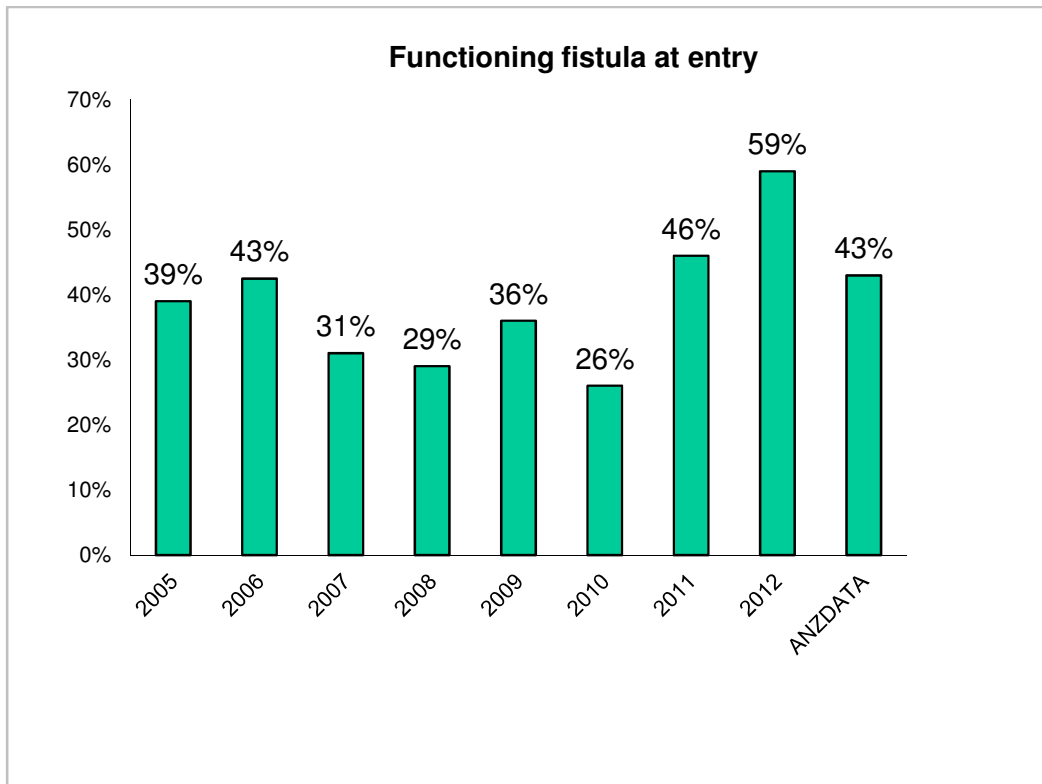
How did we Record, Store and Analyse the Data?

- Data collected monthly and retrieved from operation reports
- Stored in Excel database and RISC
- Analysed using SPSS, version 20

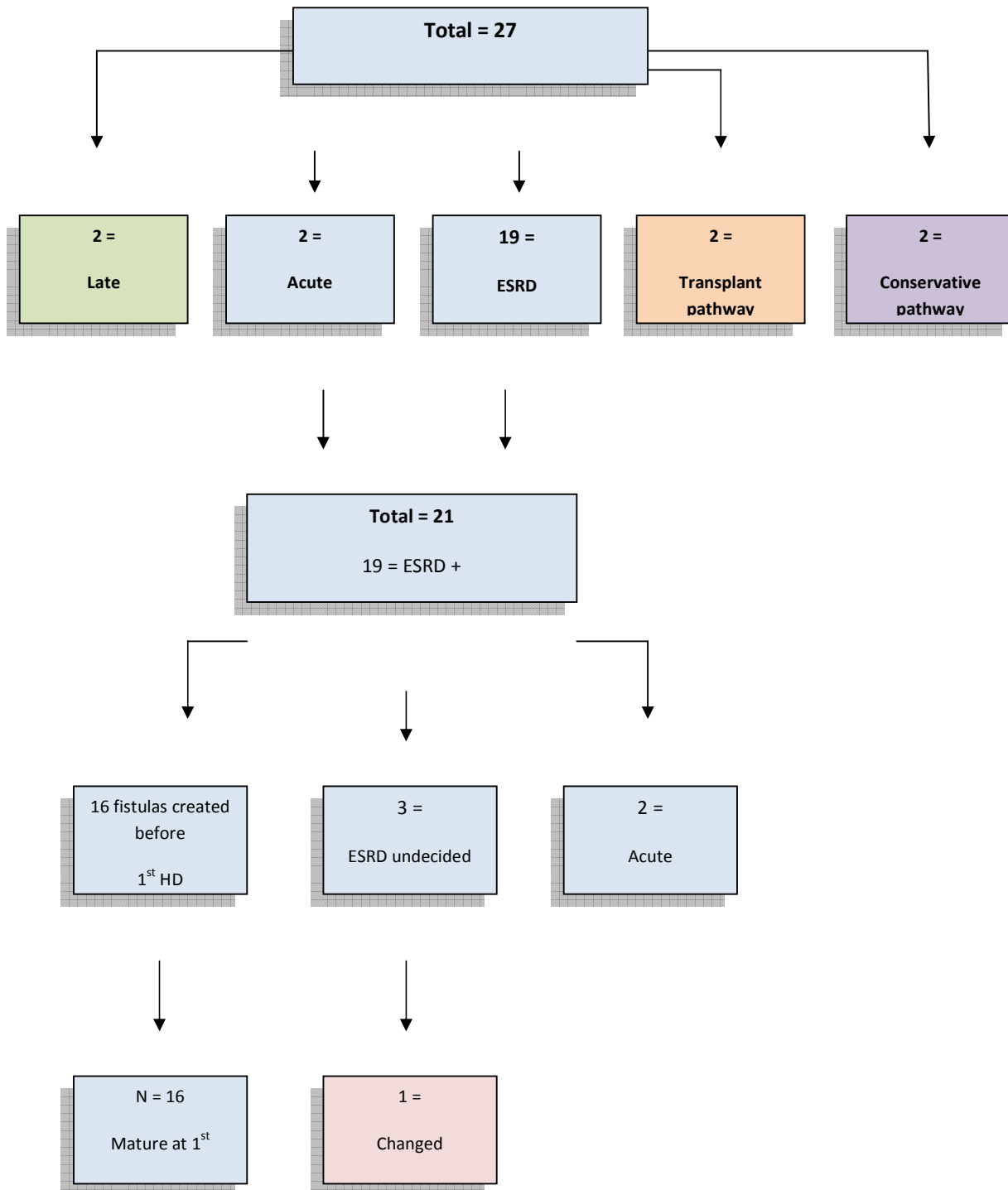
Data Benchmark:

- Data is benchmarked against ANZDATA 2011 report, KDOQI 2006 and CARI 2012 guidelines

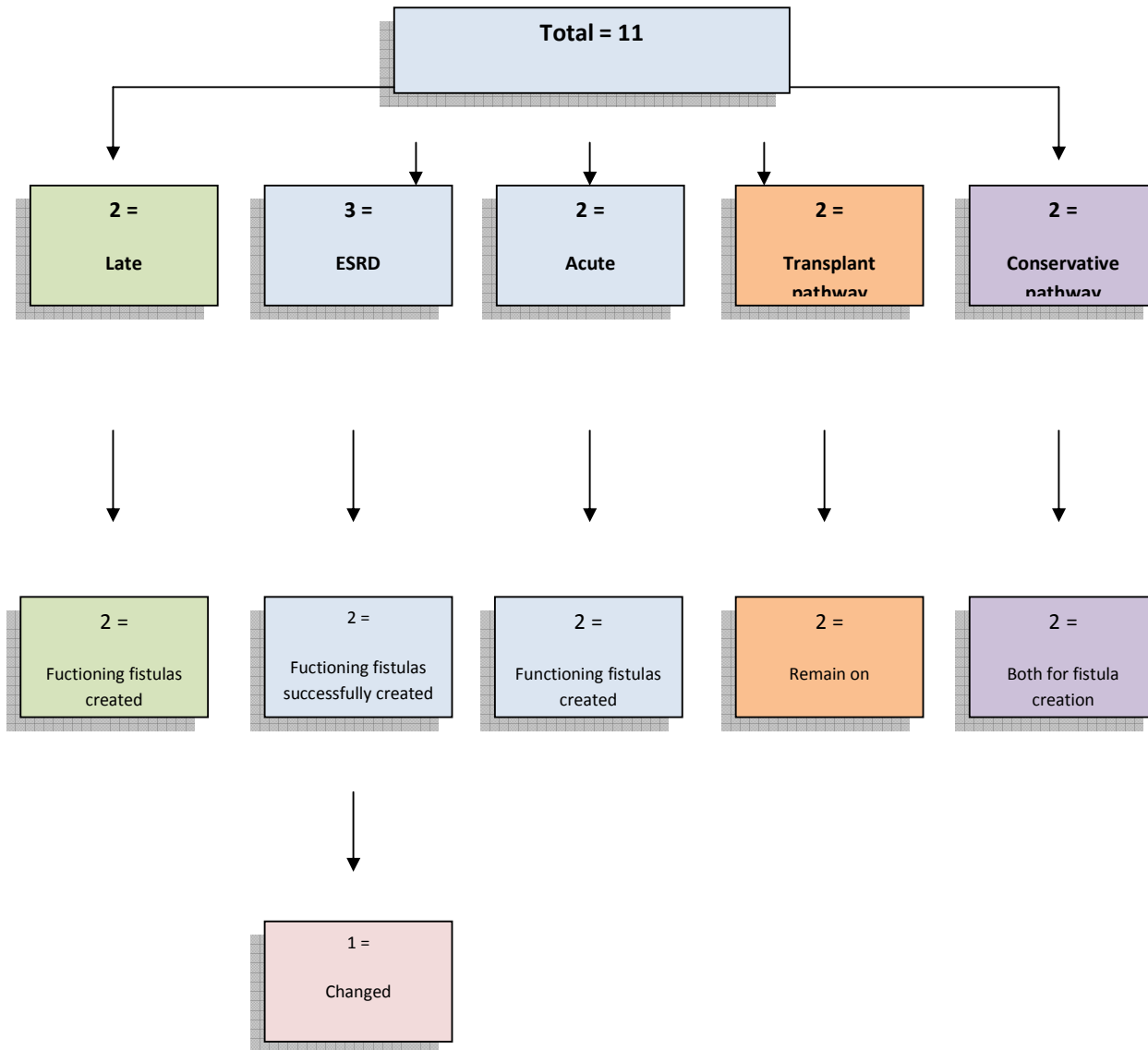
Vascular Access at Commencement of Haemodialysis:



Access created before 1st haemodialysis:



No access created before 1st haemodialysis:



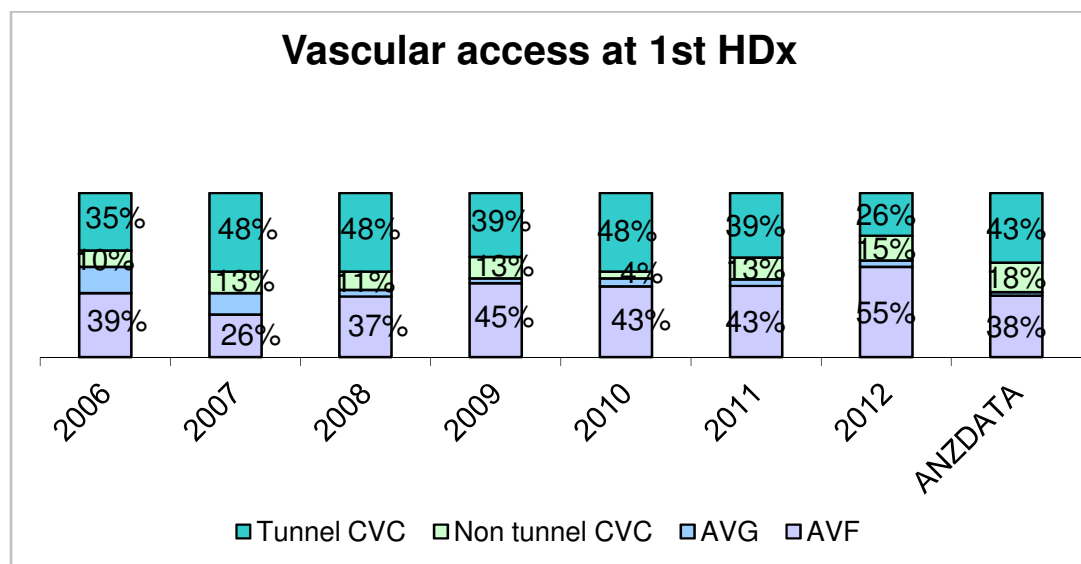
Comments:

- 5/21 (24%) patients had no access created before their first haemodialysis (**excluding late referrals, those on transplant and conservative care pathways**)
 - 3 (14%) patients undecided
 - 2 (10%) acute on chronic episode

Identified strengths and weakness:

- Centralising referrals through the VAN allows even distribution of fistula creation between the Vascular Surgeons
- Average time from initial referral to access creation was 53 days
- Average time to first cannulation was 4.6 months

Vascular Access at 1st HDx:

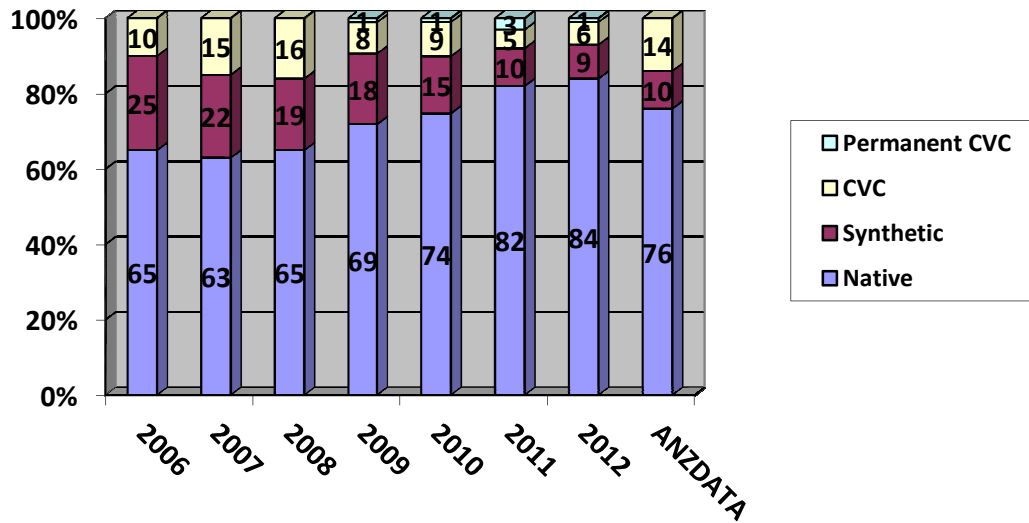


Comments:

- ANZDATA (2010 data) set a benchmark of 40% of patients having a functioning AVF (38%) or AVG (2%) at first haemodialysis (ANZDATA 2011 report)
- > 70% successful fistula access rate can be achieved with appropriate selection of vessels and procedures suitable to the individual patient (NKF K/DOQI Guidelines 2006)
- St George Hospital Renal Dept = 59% successful fistula creation (55% AVF, 4% AVG)

Access type:

Prevalent Data: (n = 195)



Comments:

- KDOQI (2006) recommends fistula use in 40% of prevalent patients
- ANZDATA set a benchmark of 87% for fistula use (ANZDATA 2011)
- 84% of our patients were using a fistula for haemodialysis

- KDOQI (2006) suggest < 10% of patients have a permanent catheter
- ANZDATA set a benchmark of 13% for permanent catheter use (ANZDATA 2011)
- 7% of our patients were using a permanent catheter

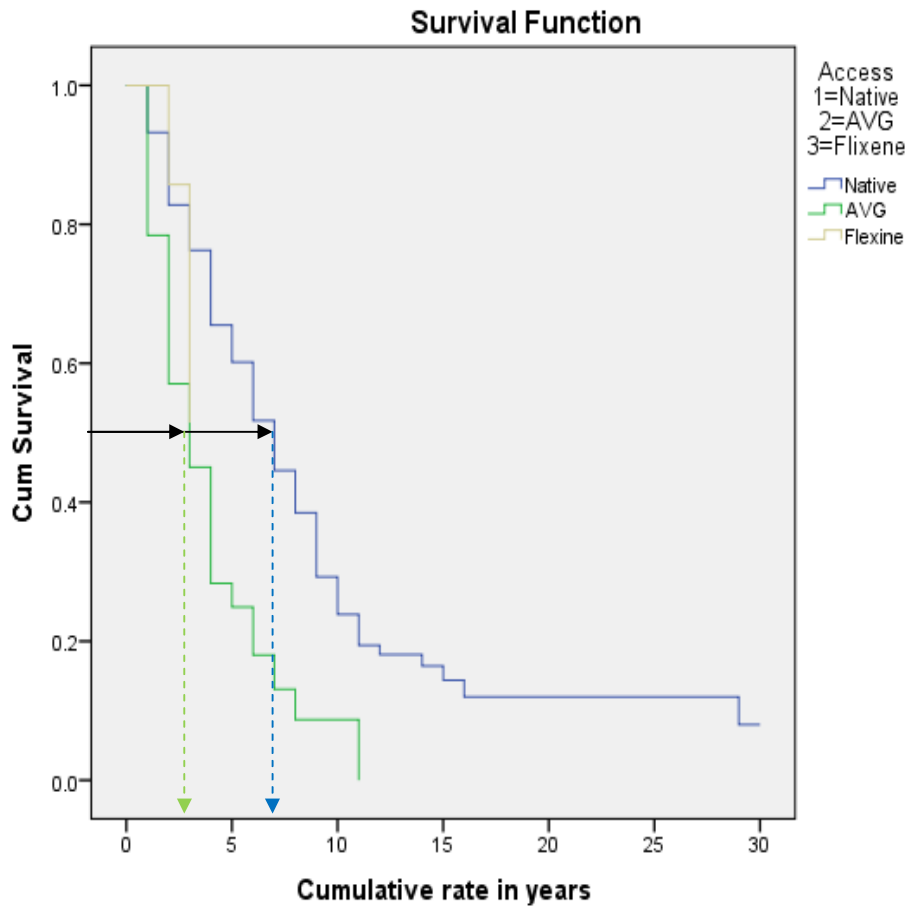
Access Infection Rates:

	Blood stream infection (BSI) range AVF/SVG	Blood stream infection (BSI) range AVG
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:

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

Access survival:



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.
- Recommended AVF patency > 3.0 years and AVG patency > 2.0 years (by life-table analysis) (KDOQI 2006)
- Cumulative proportion surviving at end of the above intervals
 - AVF at 3 years = 66%, AVG at 2 years = 45%, Flexine at 2 years = 51%
- Median survival time (time at which half the patients have reached the event)
 - AVF = > 6 years, AVG = > 2.5 years
- Surveillance/activity:
 - Clinic activity: average 30/month
 - Access interventions: average 12/month
 - New fistulas: average 6/month

Thrombosis events:

Thrombosis events:			
	AVF	AVG	Ave/mth
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:

- 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
- St George Hospital Renal Dept:
 - AVF = 0.046 episodes/pt-year
 - AVG/SVG = 0.36 episodes/pt-year
- Average 1.67 thromboses per month across all fistula types

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 2013: Vascular Access Learning Package

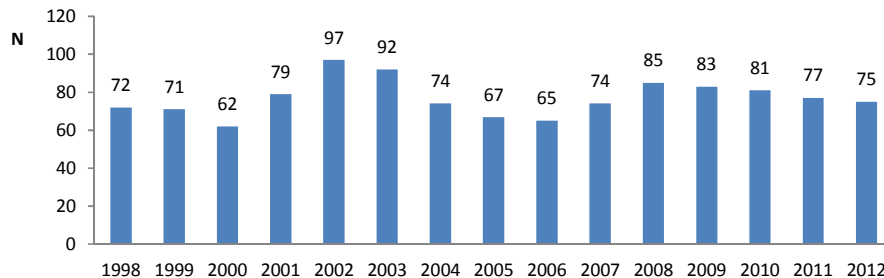
Peritoneal Dialysis

A total of 75 patients were treated on PD during the year (including hospital IPD) compared to 77 in 2011. In December 2012 the proportion of patients receiving automated peritoneal dialysis (APD) was 91%, and 9% on continuous ambulatory peritoneal dialysis (CAPD). Our APD population continues to be above the proportion reported by ANZDATA of 61%. This has been a deliberate strategy to enhance the appeal of PD for our patients thereby increasing the number of home patients.

APD	<i>ANZDATA 61% (1267/2064)</i>	<i>St George 91% (50/55)</i>
CAPD	<i>ANZDATA 41% (797/2064)</i>	<i>St George 9% (5/55)</i>

The ANZDATA 34th Annual Report 2011 (data to Dec 2010)

Total persons (prevalent and incident) on peritoneal dialysis



Data supplied by ANZDATA for PD patients at St George over the past 10 years shows very good patient outcomes and technique survival, as detailed below.

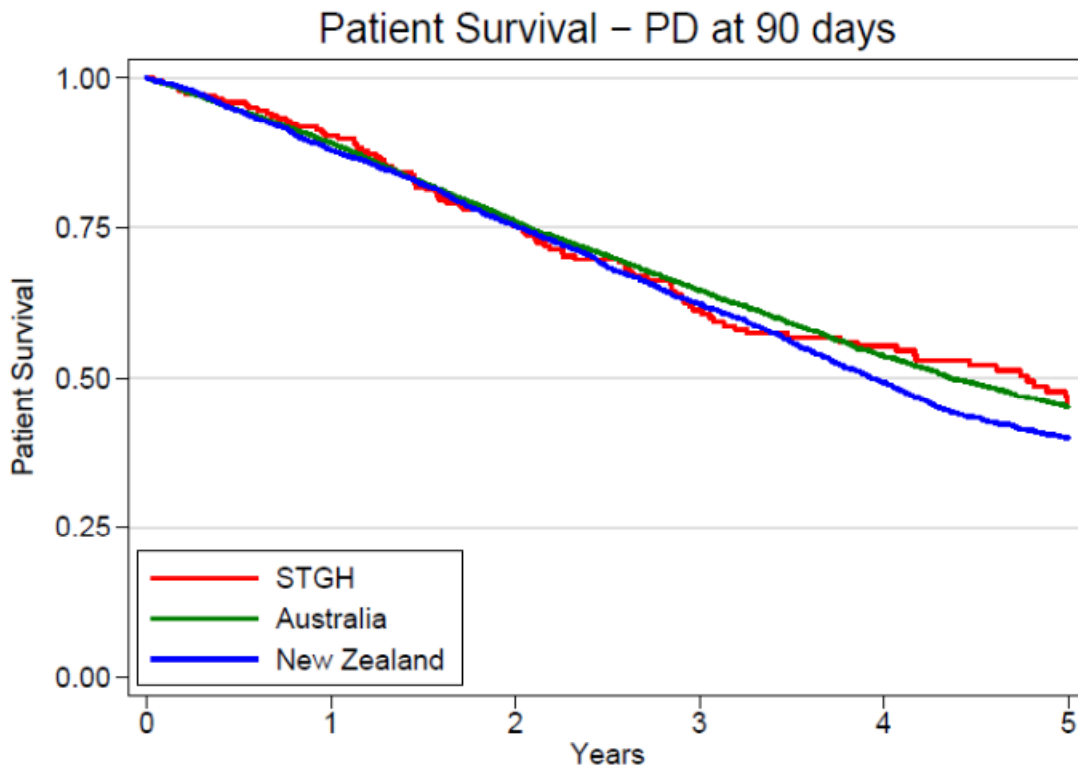


Table 13: PD patient survival

Time	STGH		Australia	
	n	% Survival (95% CI)	n	% Survival (95% CI)
0	231	100.0	7520	100.0
3 months	217	97.3 (94.2-98.8)	7041	97.4 (97.0-97.7)
6 months	208	96.0 (92.4-97.9)	6553	94.6 (94.1-95.1)
1 year	186	90.3 (85.5-93.6)	5646	89.1 (88.3-89.8)
2 years	137	75.3 (68.7-80.7)	4015	76.1 (75.0-77.2)
3 years	98	61.3 (53.8-67.9)	2831	64.6 (63.3-65.9)
4 years	74	55.3 (47.6-62.3)	1904	53.6 (52.2-55.0)
5 years	51	45.9 (37.9-53.6)	1263	45.1 (43.6-46.6)

PD patient survival – PD at 90 days. ANZDATA individual hospital report 2000-2011

Technique Survival – PD at 90 days

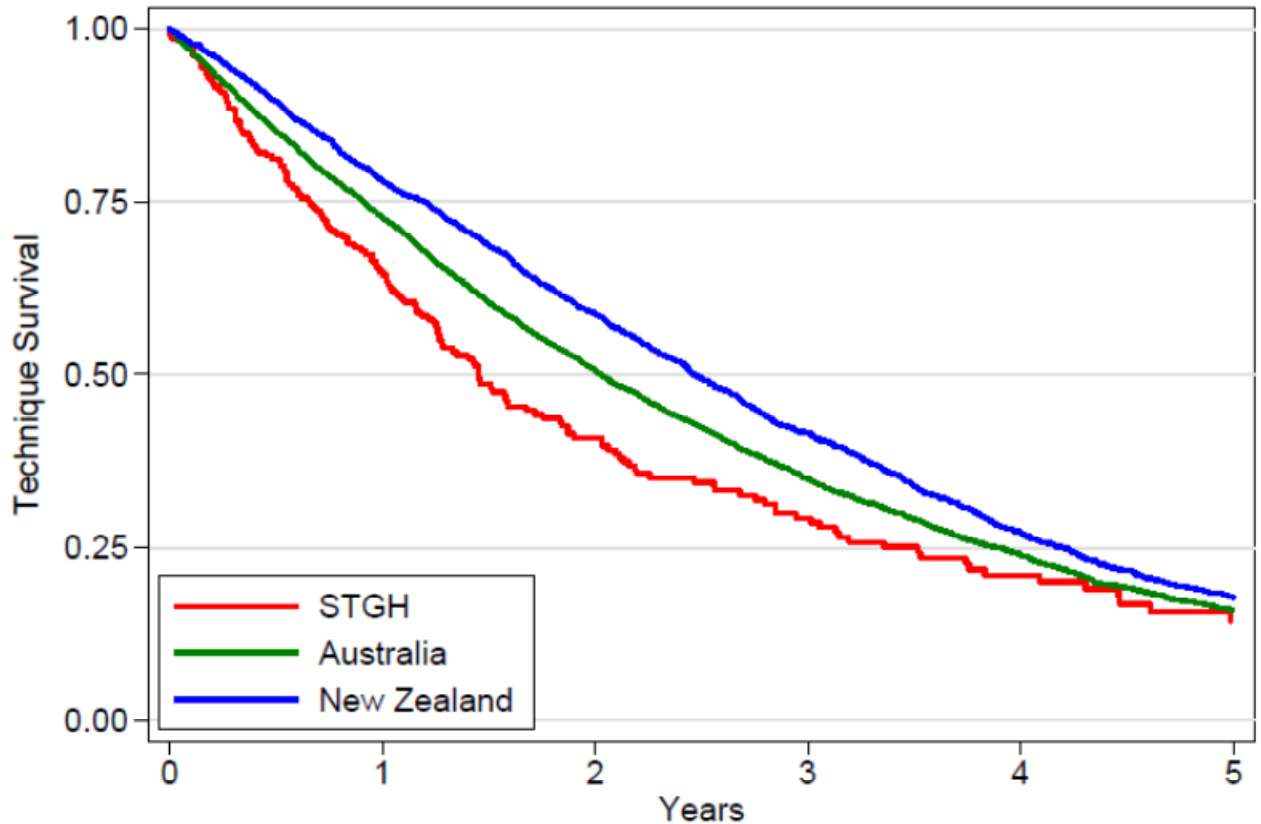


Table 14: PD technique survival

Time	STGH		Australia	
	n	% Survival (95% CI)	n	% Survival (95% CI)
0	231	100.0	7520	100.0
3 months	202	90.7 (86.1-93.8)	6668	92.3 (91.7-92.9)
6 months	175	81.2 (75.4-85.7)	5887	85.2 (84.3-86.0)
1 year	132	65.0 (58.2-71.0)	4591	72.8 (71.7-73.8)
2 years	71	40.8 (33.9-47.6)	2614	50.6 (49.4-51.9)
3 years	44	29.3 (22.9-36.0)	1464	35.0 (33.7-36.2)
4 years	24	21.1 (15.1-27.7)	790	24.0 (22.7-25.2)
5 years	11	14.4 (8.9-21.2)	421	15.9 (14.7-17.1)

PD technique survival – PD at 90 days. ANZDATA individual hospital report 2000-2011

PD Patient Flow

Balance carried forward: Peritoneal dialysis patients as at 31.12.2011 (n=60)

In	New Patients	11	
	Transfer from another hospital	1	
	Returns from HD	2	
	On hospital IPD	3	
	In Subtotal		<u>17</u>
Out	Transplants	3	
	Transfer to other units	4	
	Transfer to Home Haemodialysis	0	
	Temporary Transfers to Haemodialysis	2	
	Permanent Transfers to Haemodialysis	7	
	Return of renal function	1	
	Withdrawal from dialysis	5	
	Deaths on PD	0	
	Out Subtotal		<u>22</u>
	Net loss	5	
	PD patients December 31st 2012		<u>55</u>

Change of modality and deaths

	St George 2009 (%)	St George 2010 (%)	St George 2011 (%)	St George 2012 (%)	ANZDATA 2012 (%)
Transplants	5	4	2	5	9
Change to haemodialysis	16	41	17	16	20
Deaths	23	18	7	9	13

Note: The rates are calculated using the total number of patients on peritoneal dialysis at 31.12.2012 (n=55), the method used by ANZDATA to calculate their rates.

We have fewer deaths and fewer changes to HD than the national average.

PD Adequacy, Biochemical and Haematological targets

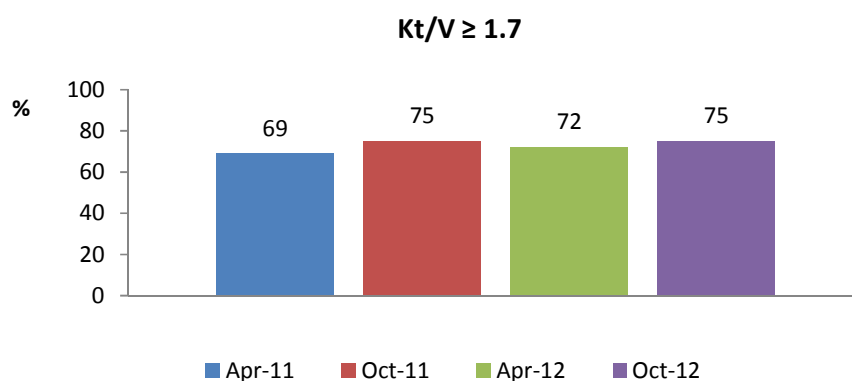
Aim

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 in October 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.

Background

An audit of biochemical and haematological markers and dialysis adequacy (Kt/V) was conducted 6 monthly for the current dialyzing PD patients and compared to previous audits.

Peritoneal Dialysis Adequacy



The benchmark used is the KDOQI a target of at least 1.7 per week.

No change can be seen over the audit periods. In October 2012 the mean Kt/V was 2.2

Parameter	Target	Apr 11	Oct 11	Apr 12	Oct 12	ANZDATA 11
Ca	2.25-2.58 mmol/L	46	56	53	33	-
Corr Ca	2.1-2.4 mol/L	32	28	32	33	-
PO4	0.8-1.6 mmol/L	40	36	42	36	45
CaPO₄	<4.0 mmol/L	49	46	42	39	61
Ferritin	200-800 ug/L	53	56	54	50	51
Transferrin	20-50%	59	69	60	64	67
Albumin	33-48 g/L	39	41	46	33	-
PTH	7-45 nmol/L	70	67	65	50	-
KT/V	≥ 1.7	69	75	72	75	-
CCL	>50L (L & LA) or >60L (H & HA)		59		62	-

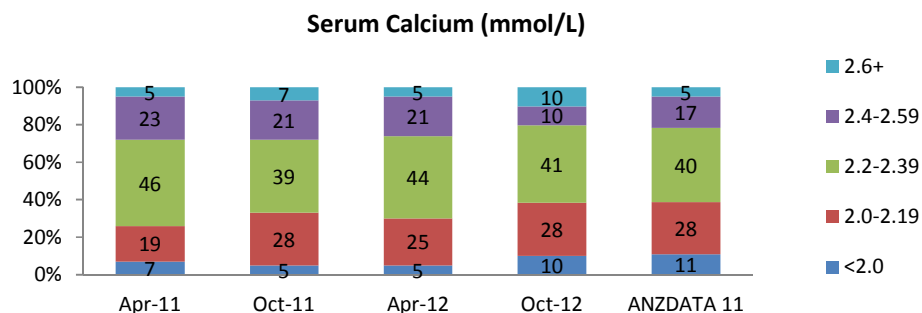
Calcium, corrected calcium, serum phosphate, calcium phosphate product, ferritin and transferrin follow the CARI targets. CARI recommends that PTH levels are one to three times the upper normal range of the assay for dialysis patients. Kt/V target is from ISPD and KDOQI while CCL target is from CARI and ISPD. Albumin range is the local laboratory reference range.

Albumin

- There was no statistically significant changes in albumin over this audit period ($p>0.05$). Thirty three percent of peritoneal dialysis patients had an albumin level within 33-48 g/L in October 2012.

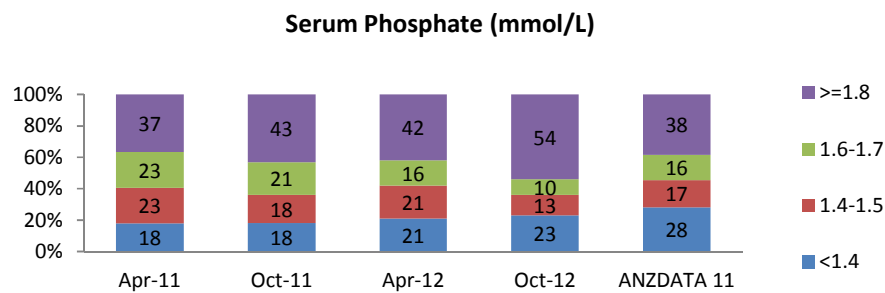
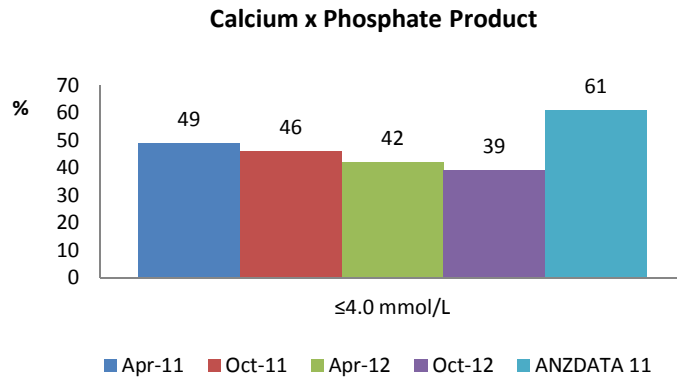
Serum Calcium

- Our profile for serum calcium is very similar to that of the national data (ANZDATA):



Calcium Phosphate Product and Phosphate

Calcium x Phosphate product and the Phosphate results did not match the ANZDATA benchmark results in October 2012 :

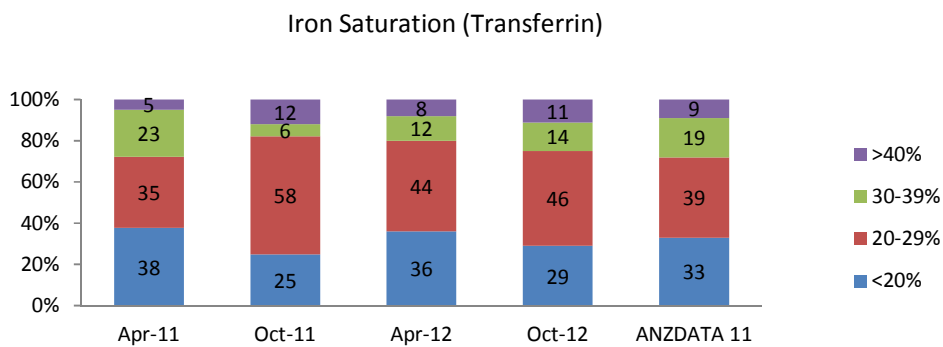
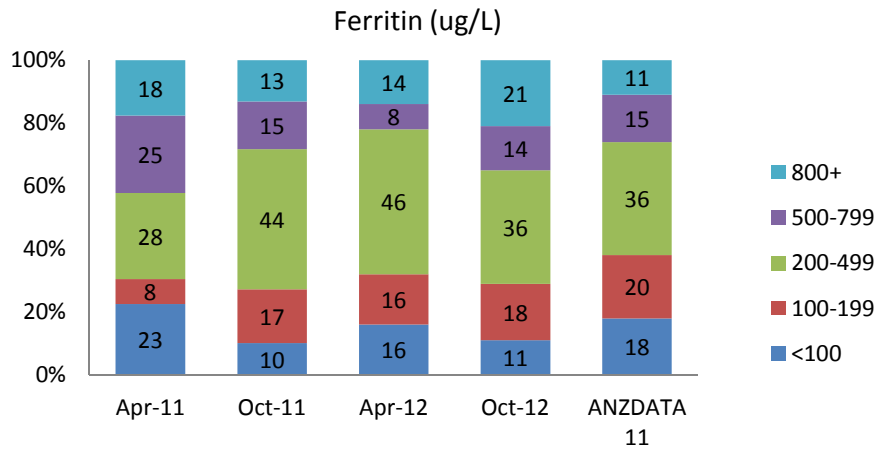


PTH

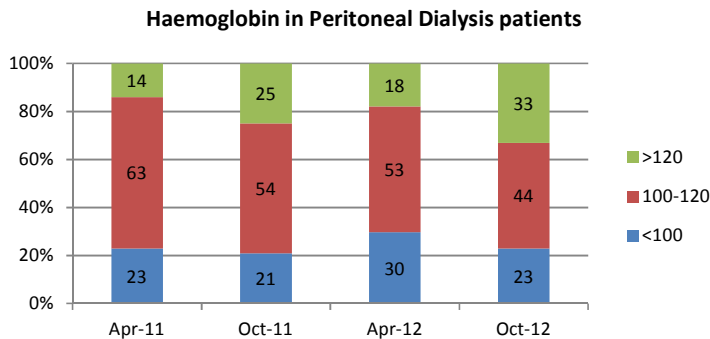
- In October 2012, 50% of peritoneal dialysis patients had PTH within 7-45 nmol/L.

Iron

- Sixty three (63%) percent of peritoneal dialysis patients were iron replete(both ferritin and saturation at target) in October 2012 compared to 58% in Oct 2011.



Haemoglobin



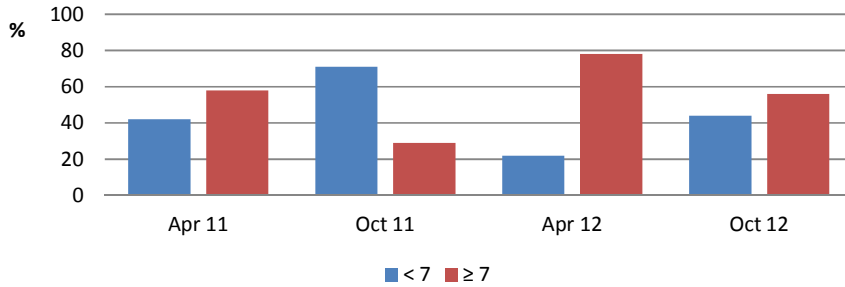
44% achieved our target of 100-120g/L.

Further analysis shows 20% of patients with a haemoglobin <100 were receiving an ESA and 28% of patients with a haemoglobin >120 were also receiving an ESA. Further analysis is required to investigate whether those who had haemoglobins below the target 100g/L had abnormal iron studies. Individual nephrologists will receive reports indicating which patients have haemoglobin and iron results outside target ranges.

HbA1c (Glycosylated Haemoglobin)

There were 18/19 diabetics screened for HbA1c in October 2012. The average HbA1c was 7.8, minimum 5.4, maximum 12.4. HbA1c results improved from April to October 2012.

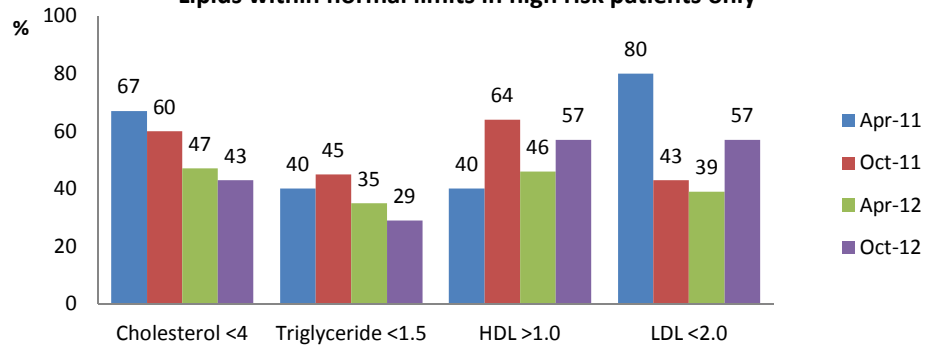
HbA1c results in PD patients



Lipids

Lipid studies were collected for the 'high-risk' patients (n=22), having or suspected of having diabetes, coronary artery disease, cerebrovascular disease and peripheral vascular disease. Total Cholesterol results have declined while LDL results are improving.

Lipids within normal limits in high risk patients only



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.

Method

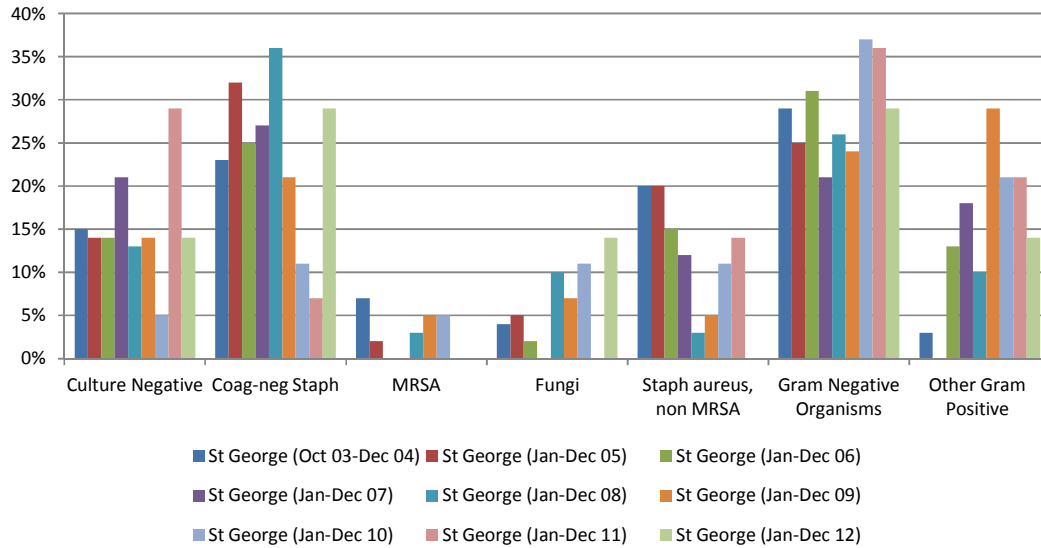
1. Peritonitis Episode Forms from ANZDATA are used to collect peritonitis information (organism, treatment, admission) regarding every peritonitis event. Patient records are reviewed for exit site infections.
2. Recurrent infections are defined as 'within four weeks of the last antibiotic dose (or within five weeks if intermittent Vancomycin used) for the same organism' (ANZDATA 2008).
3. Recurrent peritonitis infections are included from 2009 onwards in this report; previously they were excluded as per the NSW Health method of calculating infection rates per 100 patient months (NSW Health, 2005).

Outcomes

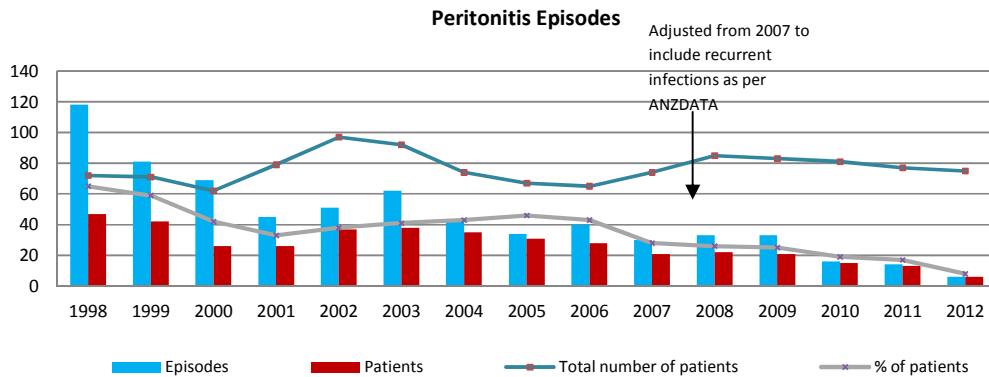
- The rates of infections from 1999 to 2012 continue to show improvement.
- Main causative organism for peritonitis infections in 2012 was coag-neg staph with one fungal infection.
- 69% of patients dialysing on December 31st 2012 remain peritonitis free.
- There are significantly fewer infections since data collection commenced and new systems were put in place to prevent these; the total number of patients has not changed.
- Peritonitis causative organisms continues to fluctuate

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total patients	71	62	79	97	92	74	67	65	74	85	83	81	77	75
Peritonitis episodes	81	69	45	51	62	42	34	40	30	33	33	16	14	6
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%
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 24%	n=11 15%

Peritonitis Causative Organisms



Peritonitis episodes and rates



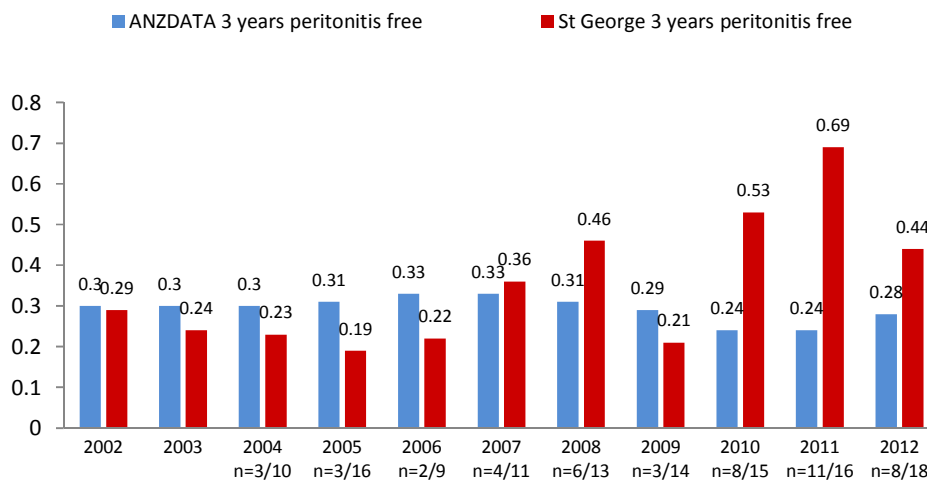
Year	STGH			Australia		
	Episodes	Years	Rate (95% CI)	Episodes	Years	Rate (95% CI)
2006	46	38.11	1.21 (0.88-1.61)	1045	1874.52	0.56 (0.52-0.59)
2007	30	46.78	0.64 (0.43-0.92)	1199	1977.40	0.61 (0.57-0.64)
2008	33	53.20	0.62 (0.43-0.87)	1313	2079	0.63 (0.60-0.67)
2009	33	55.02	0.60 (0.41-0.84)	1239	2113.91	0.59 (0.55-0.62)
2010	16	54.35	0.29 (0.17-0.48)	1101	2059.04	0.53 (0.50-0.57)
2011	15	53.46	0.28 (0.16-0.46)	844	1945.62	0.43 (0.41-0.46)
Overall	173	300.92	0.57 (0.49-0.67)	6741	12050.08	0.56 (0.55-0.57)

Rates of Peritonitis (per patient-year) ANZDATA Individual Hospital Report 2006-2011

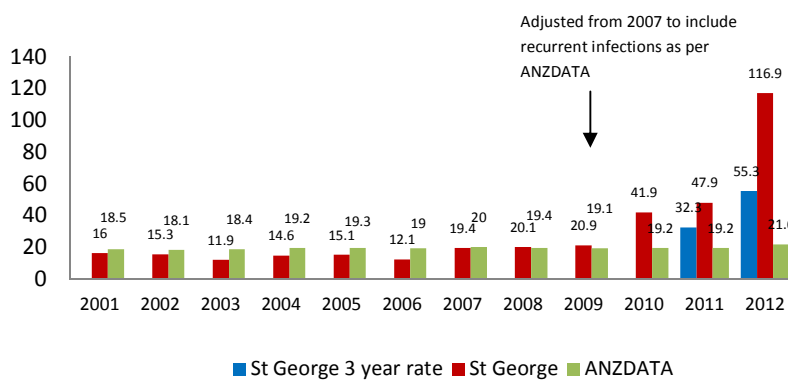
- The number of episodes of peritonitis and the number of patients who had peritonitis over the years 1998 – 2012 has shown progressive improvement. This can be attributed to better connection systems and patient training. Since data collection commenced we have been able to objectively examine change over time.

- The proportion of peritoneal dialysis patients who are 3 years peritonitis free has decreased to 44%, but still higher than ANZDATA 2011 (28%).
- Pleasingly there were no MRSA peritonitis infections in 2012.
- Comparison of peritonitis rates with the ANZDATA 2006-2011 data show the St George rate improved from 2009, but overall the rate is similar to the ANZDATA overall rate.

Proportion of patients 3 years peritonitis free



Patient months per episode of peritonitis



- Significant improvements in peritonitis rates per patient month since 2009 can be seen compared to ANZDATA 2011 Australian results.
- Median peritonitis free time for current patients is 16.4 months (17/55 remain peritonitis free) compared to the ANZDATA 2011 median peritonitis free survival of 21 months.
- The average time on dialysis for current patients who have had peritonitis is 45.6 months, and for those who are peritonitis free is 24.2 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*
Interim Haemodialysis	9	10	6	0	6	0	0
Permanent Haemodialysis	13	13	18	15(5/33)	24(4/17)	14(2/14)	11(1/9)
Catheter removed	22	20	24	15(5/33)	41(7/17)	14(2/14)	11(1/9)

**includes recurrent infections*

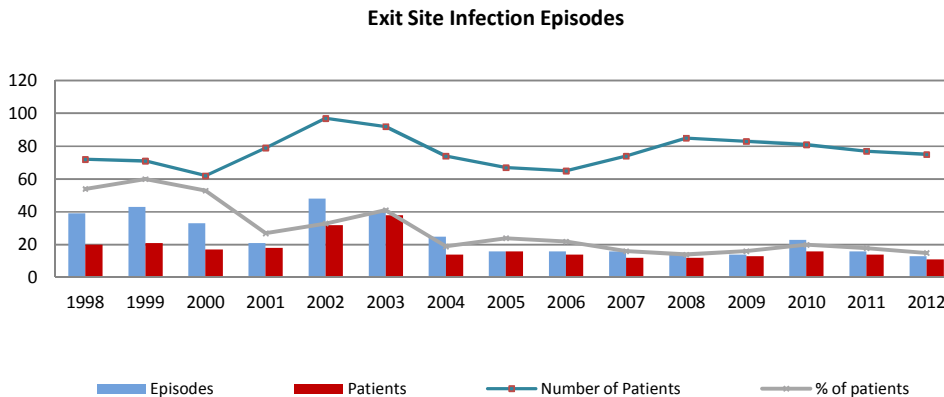
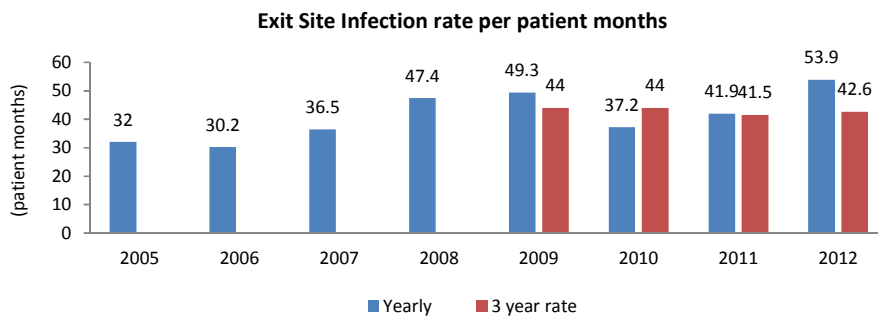
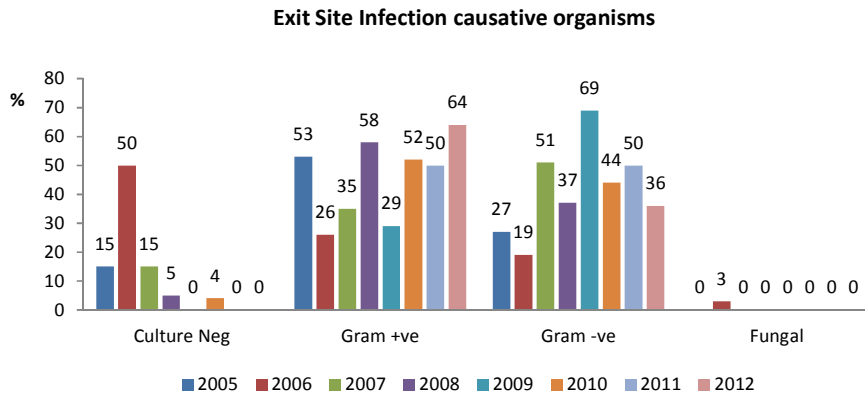
Only one patient transferred permanently as a result of peritonitis.

Summary

- ANZDATA results are the benchmark used for comparison with St George results.
- All outcome measures of patient survival, peritonitis and technique survival are much better than national outcomes.
- The percentage of patient's peritonitis free at 3 years has decreased from 69% in 2011 to 44% in 2012 which remains better than the national ANZDATA results.
- Bi-annual patient newsletter continues to be effective in ongoing education for the PD patients.
- Local insertion of the Tenckhoff PD catheter commenced in 2009 to assist patients who are on a PD pathway allowing them to commence dialysis in a prompt manner and without having to start on haemodialysis if decline in renal function was rapid or they were a late referral.

Exit Site Infections (ESI)

Exit site infections have reduced considerably since data collection began.



ANZDATA does not collect data on Exit Site Infections; therefore there is no Australian benchmark data with which to compare.

Exit Site Infection Survey

This survey aimed to ascertain the current exit site care practices of PD patients with results showing patients who soak in a bath daily and those who use paper towels to dry their exit sites are more prone to exit site infections. These exit site care issues were addressed in the bi-annual newsletter and during patient training.

Technique failure

- Nine patients transferred to haemodialysis either temporarily or permanently during 2012, a decrease from 2011. There were no transfers to haemodialysis through 'social' causes in 2012.
- ANZDATA 2011 reports the most common primary cause of technique failure (ceasing peritoneal dialysis) as 'total dialysis/technical failure' (44%) and 'social' as the second most common cause (34%). The St George primary cause of failure in 2012 is 'total dialysis/technical failure' (78%) originating from blocked catheters, membrane failure resulting in inadequate solute clearance, leaks and surgery.

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	ANZDATA 2011
Infective	44%	24%	18 %	22%	22%
Total Dialysis/Technical Failure (inadequate dialysis, leaks, surgery, mechanical)	44%	62%	73%	78%	44%
Social (patient choice, failed training)	11%	14%	9%	0%	34%

Summary

1. Patient survival on PD is excellent and well above the National average.
2. The marked reduction in the peritonitis rate to 1/117 patient months, or the 3 year rate of 1/55 is a great achievement for the PD unit.
3. Exit site infection rates improved slightly during the 2012 period, attributed to better patient follow up and re-education where necessary following the results of an exit site survey conducted in late 2011.
4. The percent of patients transferring to haemodialysis through technical failure (leaks, surgery and mechanical) increased in 2012. These transfers can be accounted for with pleural leaks, hernias, bowel surgery and inadequate solute clearance problems. This is similar to previous reports.
5. The rate of failing PD due to social reasons continues to be lower than the rate reported by ANZDATA which implies that patients remain happy with this modality of treatment
6. There is room for improvement in improving phosphate control and nutrition, though these are clearly not impacting upon patient survival at this stage.
7. With such good outcome results our Unit should encourage as many patients as possible to this modality of treatment.

Future plans

- Annual “People on PD support Groups” to continue.
- Annual Allied health talks for the PD patients.
- The annual review of PD policies to continue, to keep it in line with ISPD best practice guidelines.
- Re-introduction of a “Glitterbug” hand hygiene project to assess PD patients hand hygiene practice when training.
- Exit site care practices to now include chlorhexidine swabs and bactroban ointment.
- Patients with sensitivities to current exit site dressings will trial a silicone based dressing.

QUALITY OF LIFE

Background

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

Aim

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

Method

- Home haemodialysis, peritoneal dialysis (PD) and transplant patients were sent a SF 36 questionnaire via the mail with a reply paid envelope attached. Hospital and satellite haemodialysis (HD) patients were handed their questionnaires in person.
- Patients excluded from the survey were non-English speaking or suffering from dementia or a psychological condition.
- All returned surveys were entered into the QualityMetric Health Outcomes Scoring software and SPSS 20 for statistical analysis.
- Data was also collected on patient's age, sex, diabetic status, haemoglobin, albumin and Kt/V from data already available from routine audits.
- SF-36 scores were compared with dialysis mode, diabetic status, albumin results below 30g/L and haemoglobin <100g/L using the appropriate parametric or non-parametric unrelated two sample statistical tests; correlation and regression analysis was also carried out to determine if there were any significant linear relationships.
- Transplant patients are analysed separately from dialysis patients.

SF 36 Questionnaire

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

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

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

Benchmark Data

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

Ethics

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

How did we record, store & analyse the data?

- All returned surveys were entered into the QualityMetric Health Outcomes Scoring software and a statistical program (SPSS 20) for analysis.
- Data was also collected on patient's age, sex, diabetic status, Hb, albumin and Kt/V from routine audits and entered into an Excel database for analysis in SPSS.
- SF-36 scores were compared with gender, dialysis mode and diabetic status using the appropriate parametric or non-parametric unrelated two sample statistical tests.
- Regression analysis determined if there was any significant relationship between SF-36 scores and Haemoglobin, albumin, Kt/V and age.

Results

Responders

A total of 314 surveys were distributed with 154 returned. The return rate was 49% which is significantly less than previous surveys which were approximately a 61% return rate. No reason could be found for the poor returns as there was no change to the method used in the past.

Table 2: Patient Characteristics (excludes transplant)

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

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

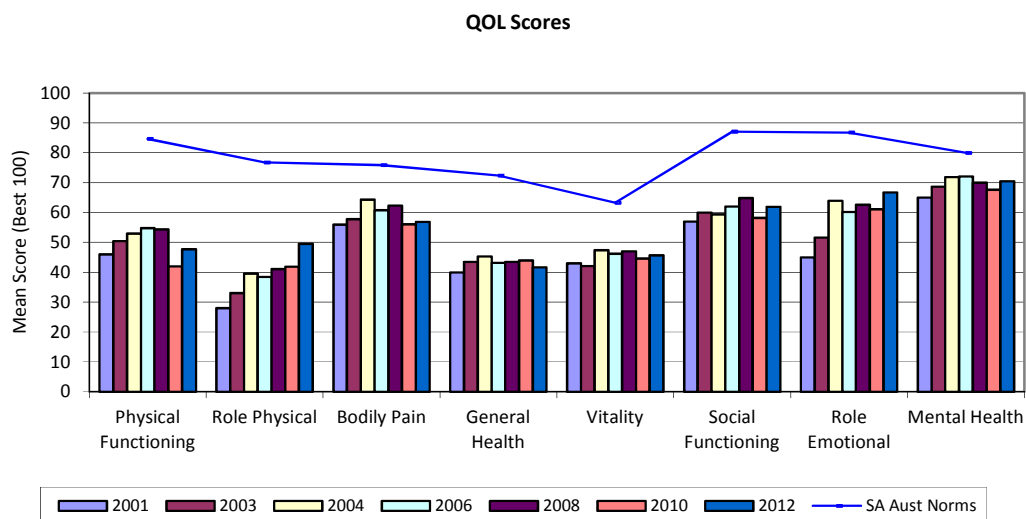


Figure 1: QOL Results in dialysis (excludes transplant) 2001 - 2012

The dialysis patients in the St George renal unit continue to have a poorer self assessed QOL than the average Australian in all of the eight measured parameters. Since QOL measurement commenced in 2001 there is a significant difference in the scores in physical functioning and role physical. In 2010 the age of patients was significantly higher than previous years ($X^2=21.7$, $df=5$, $p=0.001$), but diabetes has increased significantly throughout the survey collection since 2003 ($X^2=16.4$, $df=5$, $p<0.01$). The rate of diabetes in the survey group has increased from 25% in 2003, to 47% in 2012. The largest increase in rate has occurred in the 2010 and 2012 surveys.

Table 3: QOL results by renal replacement therapy (RRT) modality not stratified for age

Parameters	Hospital (n=43)	Satellite (n=25)	Home (n=22)	Peritoneal dialysis (n=22)	Transplant (n=71)	Test Statistic ^a	df	p-value
PF	40.7 (27.1)	45.5 (25.2)	59.1 (26.2)	46.1 (32.3)	76.3 (26.7)	X ² =41.3	4	0.000
RP	45.1 (32.8)	41.3 (27.7)	59.4 (26.4)	50.7 (39.5)	74.5 (27)	X ² =26.0	4	0.000
BP	46.6 (29.6)	54.3 (32.5)	64.1 (34.5)	65.7 (25.4)	73.1 (32.5)	X ² =14.5	4	0.006
GH	39.5 (21.5)	36.2 (17.8)	50.3 (23.4)	32.2 (24.1)	57 (22.1)	F=5.9	4	0.000
VT	46.8 (24.9)	41.7 (21)	50.1 (24.1)	42.2 (26.4)	58.8 (19.8)	X ² =15.0	4	0.005
SF	59.3 (28.3)	66.7 (22)	67.9 (33.2)	53.7 (34.2)	77.5 (23.5)	X ² =13.7	4	0.008
RE	61.9 (35.8)	60.9 (27)	70.5 (30.5)	74.5 (37.1)	82.1 (24.2)	X ² =10.5	4	0.032
MH	67.2 (20.9)	72 (20.2)	71.9 (24.4)	72.7 (19.1)	73.3 (18)	X ² =2.1	4	>0.05
Age	72.3 (10)	71.5 (11.3)	62.3 (10.7)	59.3 (17.8)	55.3 (12.9)	F=12.4	4	0.000
Albumin	33.8 (5.1)	35 (2.2)	35.8 (2.5)	29.1 (6.3)	38 (3.6)	X ² =45.1	4	0.000
Haemoglobin	120.8 (8)	117.2 (8.6)	113.5 (23.2)	104.5 (15.9)	131.2 (16.7)	X ² =37.6	4	0.000
Kt/V ^b	1.7 (0.4)	1.5 (0.3)	-	2.2 (0.8)	-	F=9.5	2	0.000

Data reported as mean and (standard deviation)

^a H=Kruskal-Wallis Test, F= ANOVA (Kt/V = 2 sample t test using hospital and capd data only)

^b Kt/V expected to differ due to differing benchmarks between the modalities (haemodialysis aim is >1.4 while capd is >1.6)

Mean Scores by Modality 2012

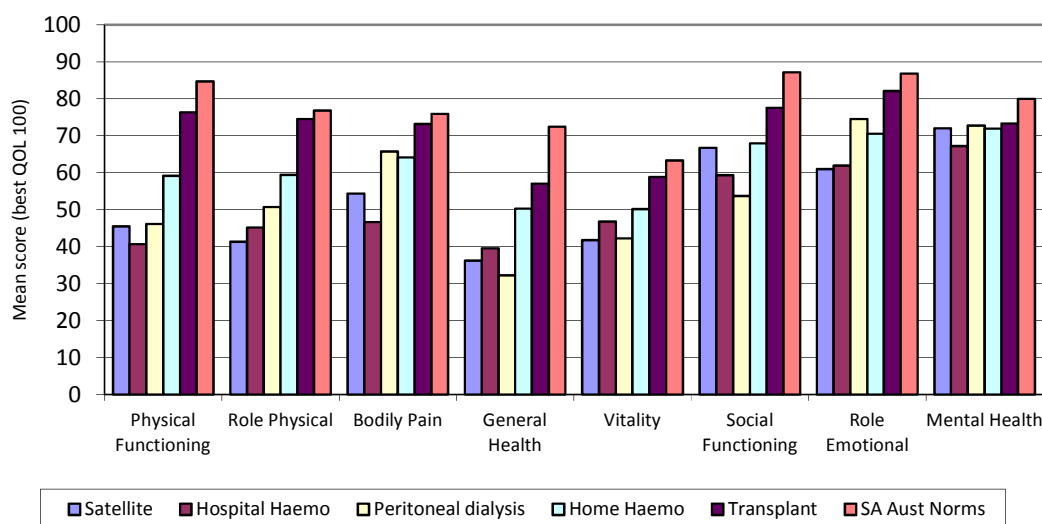


Figure 2: QOL scores by RRT modality

The SF36 scores show a significant difference between the modalities in all parameters ($p < 0.05$) excluding mental health. This is consistent with the 2008 and 2010 results showing home haemodialysis offers a better overall QOL in all parameters compared to hospital haemodialysis and satellite haemodialysis.

Newly added in 2010 was the transplant population which shows overall better QOL in all parameters in 2012 compared to all dialysis options, this is consistent with the results from 2010.

Comparing peritoneal dialysis with hospital or satellite haemodialysis; peritoneal dialysis shows only slightly better physical results, better pain and emotional scores, worse general health, vitality and social functioning.

Diabetics excluding transplant

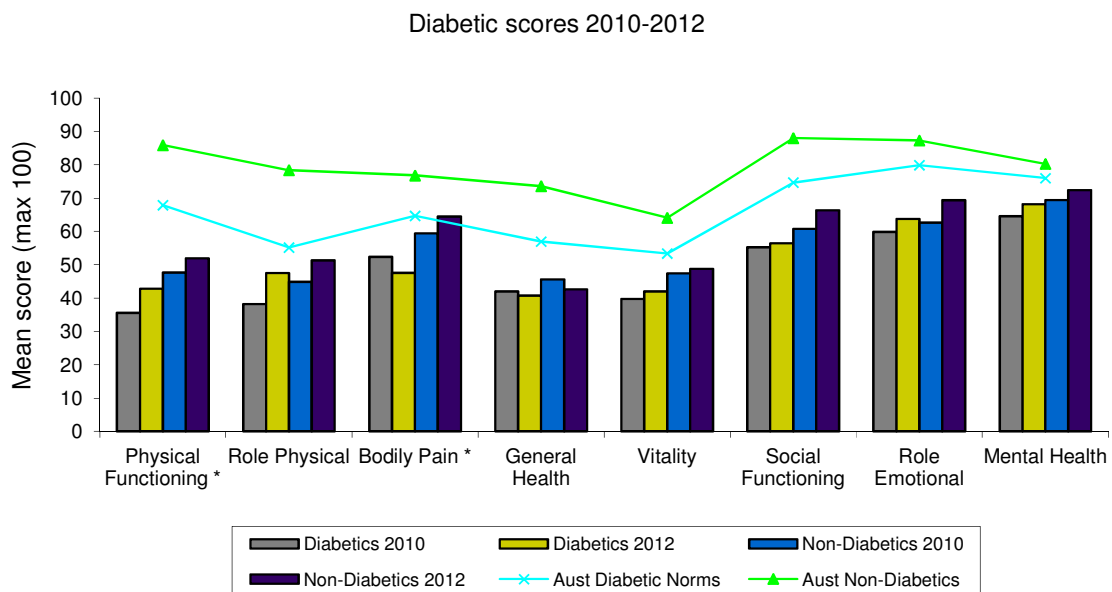


Figure 3: QOL scores for diabetics and non-diabetics 2010-2012

* $p < 0.05$ in Bodily Pain in 2012 results comparing diabetics and non-diabetics.

* $p < 0.05$ in physical functioning in 2010 results comparing diabetics and non-diabetics.

There is no statistically significant difference between the QOL results of 2010 and 2012 scores overall, but significance shown between diabetics and non-diabetics. Comparing diabetics and non-diabetics, the 2012 results showed a significant difference in bodily pain scores ($Z = -2.3$, $p < 0.05$) while the 2010 results showed a significant difference in physical functioning scores ($F = 1.9$, $t = -2.2$, $p < 0.05$). This is an indication of the impact of the dual diagnosis of diabetes and renal disease on the quality of life of dialysis patients and the significant overall impact on their physical health.

Age Groups excluding transplant

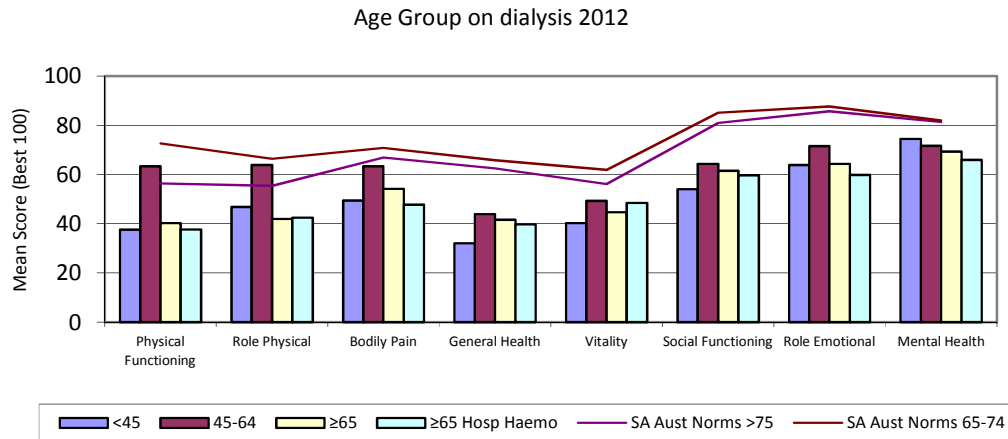


Figure 4: QOL scores for age groups. Patients undergoing dialysis (excludes transplant)

Age groups are compared excluding transplant patients as they are a very different demographic group. Statistical significance is found using ANOVA in Physical Functioning and Role Physical between age groups ($p < 0.05$). The physical results are not unexpected due to the expected deterioration with age.

The age groups survey graph has haemodialysis scores added for the ≥ 65 year group to visualize how age and dialysis impact on QOL (Peritoneal dialysis is excluded due to lack of numbers in this age group). In 2012 this elderly age group reported an improved QOL compared to 2010, with scores better than the < 45 year olds, but due to low numbers in the < 45 year group ($n=6$) compared to $n=28$ and $n=52$ in the 45-64 and ≥ 65 year groups respectively the sample size is too small to draw any conclusions.

Change in Haemodialysis scores by survey

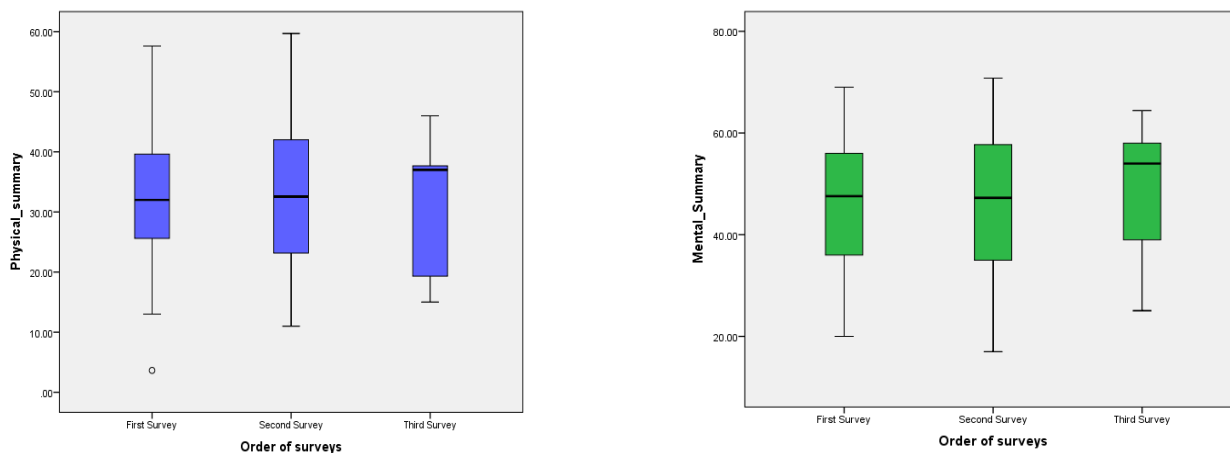


Figure 5: Change in Mental and Physical Summary scores in the 65 years and over hospital haemodialysis population since 2004

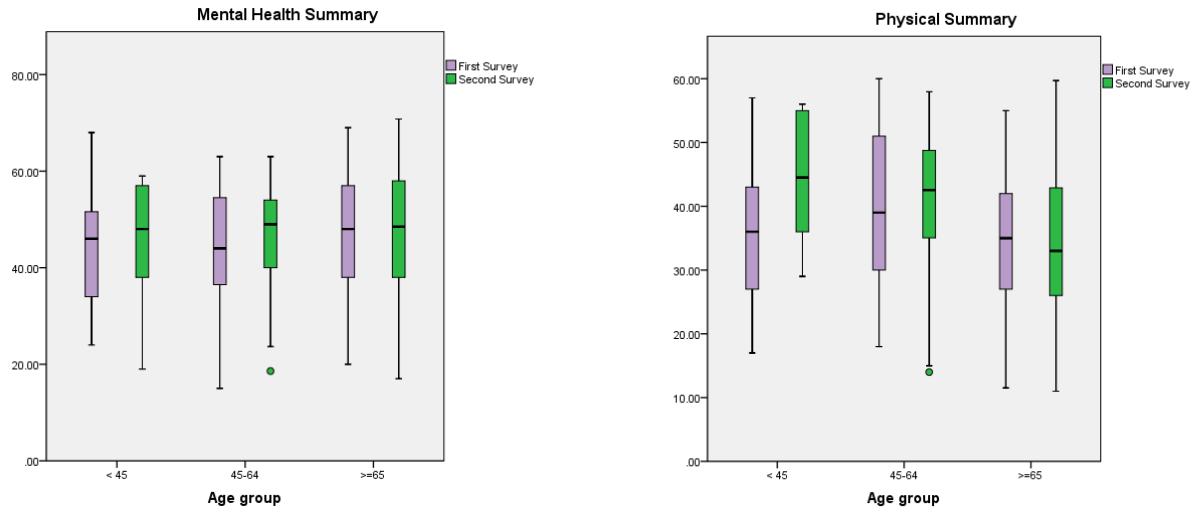


Figure 6: Mental and Physical summaries scored from SF36 survey for dialysis patients only (excludes transplant and patients with only one survey)

The above figures represent the 65 years and over age group during three survey periods since 2004. There is no difference in the mental and physical summary over three surveys. The mean score has improved in the third survey.

Analysis was carried out for dialysis patients who had completed two or more surveys (excluded transplants and those who had only completed one survey). These two surveys are likely between 1 and 2 years apart. The box plots above represent these age groups and show little change between first and second surveys. The <45 year age group showed the best improvement in the physical summary scores between the first and second surveys. There was no statistical significance.

Correlations

Correlation analysis between age, albumin, haemoglobin, Kt/V and all eight QOL variables showed weak but significant correlations between vitality and physical functioning $r^2=0.35$ ($F=43.7$, $df=1$, $p<0.01$); vitality and general health $r^2=0.52$ ($F=84.7$, $df=1$, $p<0.01$); vitality and social function $r^2=0.5$ ($F=79.8$, $df=1$, $p<0.01$). There are weak but significant correlations within the remaining QOL variables, but no significant correlations between QOL variables and age, haemoglobin, albumin or Kt/V.

Renal Supportive Care Clinic QOL Scores

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

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

Renal Supportive Care Groups QOL at first visit to clinic 2009-2012

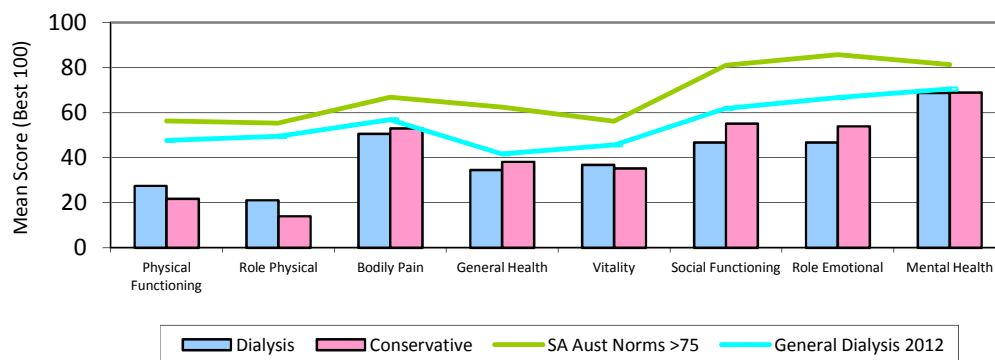


Figure 7: Renal Supportive Care clinic QOL results broken down into conservative and dialysis patient groups

The above graph represents both the dialysis patients and the conservatively managed patients who visit the RSC clinic and their initial QOL scores at their first visit. These are compared to the general dialysis population of 2012 and the SA normal population for people aged over 75 years. It shows that those people who are actively treated with dialysis who have difficult to manage symptoms have a QOL that is very poor physically compared to the general dialysis population, and the QOL close to that of the conservatively managed group. Although QOL is difficult to shift with symptom management alone due to the many factors that influence a patient's interpretation of their own QOL, managing patients within a RSC clinic provides the patients access to expert symptom management advice, treatment and support.

Transplant

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

Table 4: Transplant patient characteristics 2010-2012

	2010	2012
Age	53.8 ± 12.7	55.3 ±
Male	63%	57%
Diabetes	15%	13%
Haemoglobin	134.6 ± 19.5	131.2 ± 16.7
Haemoglobin <100g/L	5%	4%
Albumin	38 ± 3.7	38.3 ± 3.6
Albumin <30g/L	5%	2%

Transplant QOL scores 2010-2012

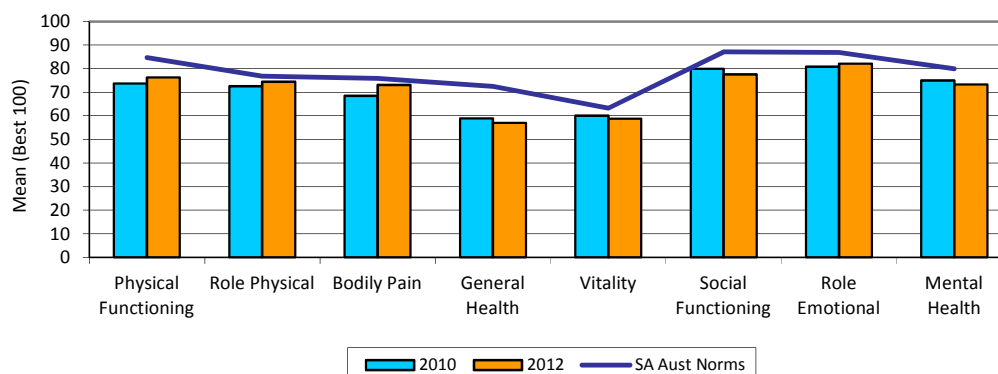


Figure 8: Transplant QOL scores 2010 - 2012 compared to the SA population

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

Conclusion

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

The results of the SF-36 survey has shown a difference in the self reported QOL of patients between the dialysis modalities. Home haemodialysis patients have better physical quality of life scores compared to peritoneal dialysis and hospital haemodialysis. Although part of this includes a selection bias this has implications for the renal unit with regards to promoting the home haemodialysis option to eligible patients especially between the ages of 45-64.

There is a significant increase in diabetics in the 2010/2012 survey groups, but this does not seem to have impacted the QOL results. Diabetics are at risk of potentially life altering symptoms such as pain from peripheral neuropathy and vascular disease so ensuring access to symptom management resources such as the renal supportive care team could be of benefit.

References

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

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TRANSPLANTATION

The aim of this report is to provide data about the outcomes of patients:

- who have had a renal transplant and are under the care of a St George Hospital (SGH) nephrologist
- currently on the National Organ Matching Service (NOMS) transplant waiting list
- who have been renal donors

Overview

At the end of 2012 there were 164 patients under the care of SGH nephrologists with functioning renal transplants.

- 156 of these were primary grafts and 9 were second grafts
- 9 were pre-emptive transplants

57 dialysis patients are waiting for a kidney transplant and 7 patients with CKD are cleared for pre-emptive transplant or for listing once they start dialysis.

During 2012

- 19 patients received kidney transplants and one received a kidney pancreas transplant
- 5 patients died during the year all with functioning grafts:
 - 1 of a pulmonary embolus during the first 3 months post-transplant
 - 2 of sepsis at 4 years and 20 years post transplant
 - 2 of cancer at 8 and 17 years post transplant
- There were 3 graft failures during the year:
 - 1 from acute recurrence of primary disease (FSGS) at 10 weeks post transplant
 - 1 from surgical complications of necrosed ureter at 9 weeks post transplant
 - 1 from chronic rejection due to presumed non-compliance with medication at 4 years post transplant.
- 2 patients transferred out and 1 patient transferred in
- All patients on the waiting list were assessed by a nephrologist from the transplanting unit (Prince of Wales Hospital) in accordance with TSANZ guidelines. A total of 75 patients were assessed:
 - 72 being suitable for listing,
 - 7 suitable for pre-emptive transplantation
 - 3 not suitable because of co-morbidities.
- Total SGH transplant patient population at end 2012 = 164

Transplant patient flow

	1/1/12 SGH transplant patients registered with ANZDATA		153
Out	Transferred care out	2	
	Died	5	
	Graft failure transferred back to dialysis	3	
	Subtotal out		10
In	Transplanted	20	
	Transferred care in	1	
	Subtotal in		21
	Net gain		+11
	31/12/12 SGH transplant patients		164

Patient and graft survival (ANZDATA 2000-2011)

KPI: 1, 5 and 10 year graft and patient survival at or better than national

Table 11: Patient survival for primary deceased donor grafts.

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	81	100.0	3672	100.0	568	100.0
3 months	77	97.5 (90.4-99.4)	3498	98.5 (98.0-98.8)	540	97.0 (95.2-98.1)
6 months	76	97.5 (90.4-99.4)	3356	97.7 (97.1-98.1)	521	96.6 (94.8-97.8)
1 year	72	94.9 (87.0-98.1)	3102	96.6 (95.9-97.1)	497	96.2 (94.3-97.5)
2 years	59	94.9 (87.0-98.1)	2645	94.7 (93.9-95.4)	447	94.2 (91.9-95.9)
3 years	52	93.1 (84.1-97.1)	2283	92.7 (91.7-93.6)	391	91.4 (88.6-93.5)
4 years	43	85.6 (73.8-92.4)	1935	91.4 (90.3-92.3)	346	89.1 (86.0-91.6)
5 years	42	85.6 (73.8-92.4)	1656	89.4 (88.2-90.5)	289	86.3 (82.8-89.2)

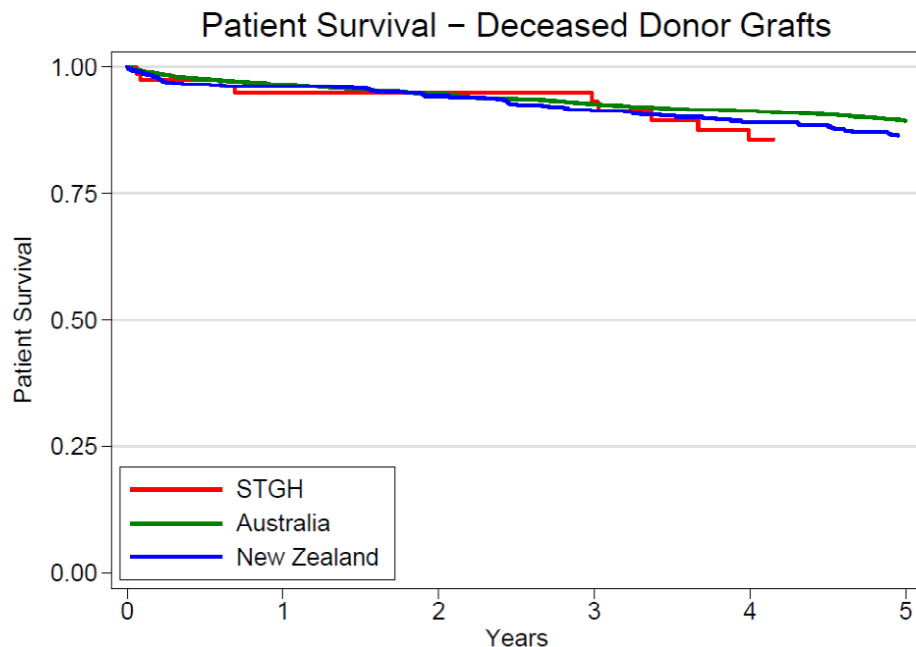


Table 17: Graft survival of primary deceased donor grafts.

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	81	100.0	3672	100.0	568	100.0
3 months	74	93.8 (85.7-97.4)	3387	95.3 (94.6-96.0)	514	92.4 (89.9-94.3)
6 months	72	92.5 (84.1-96.6)	3235	94.2 (93.4-94.9)	493	91.7 (89.1-93.7)
1 year	68	89.9 (80.8-94.8)	2971	92.6 (91.7-93.5)	471	91.1 (88.4-93.2)
2 years	54	88.4 (78.9-93.8)	2503	89.8 (88.7-90.8)	418	88.3 (85.3-90.7)
3 years	46	84.7 (73.9-91.3)	2133	86.9 (85.7-88.1)	365	85.9 (82.6-88.6)
4 years	41	82.7 (71.2-90.0)	1777	84.1 (82.7-85.4)	320	83.4 (79.8-86.4)
5 years	40	80.7 (68.6-88.5)	1498	81.3 (79.7-82.7)	261	78.9 (74.8-82.4)

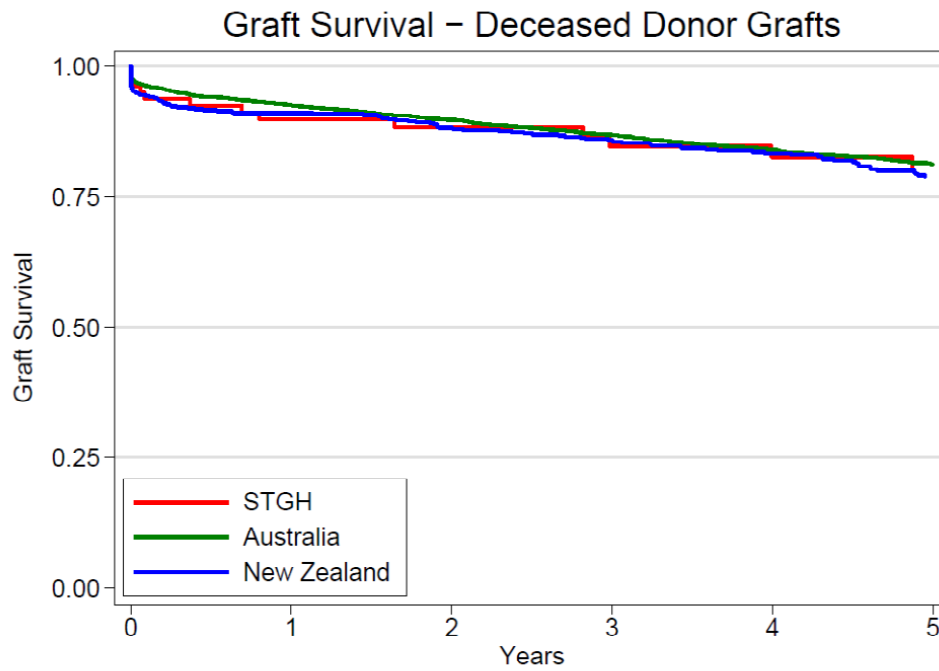


Table 12: Patient survival for primary living donor grafts.

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	37	100.0	2559	100.0	539	100.0
3 months	35	100.0	2491	99.5 (99.2-99.7)	519	98.7 (97.3-99.4)
6 months	34	100.0	2425	99.0 (98.6-99.4)	503	98.7 (97.3-99.4)
1 year	34	100.0	2307	98.8 (98.2-99.1)	475	97.9 (96.2-98.8)
2 years	31	100.0	2043	97.9 (97.3-98.4)	417	97.2 (95.4-98.3)
3 years	29	100.0	1757	97.1 (96.3-97.7)	358	95.5 (93.1-97.0)
4 years	25	100.0	1462	96.1 (95.2-96.9)	299	94.9 (92.4-96.6)
5 years	20	95.7 (72.9-99.4)	1233	94.9 (93.8-95.8)	244	93.2 (90.2-95.3)

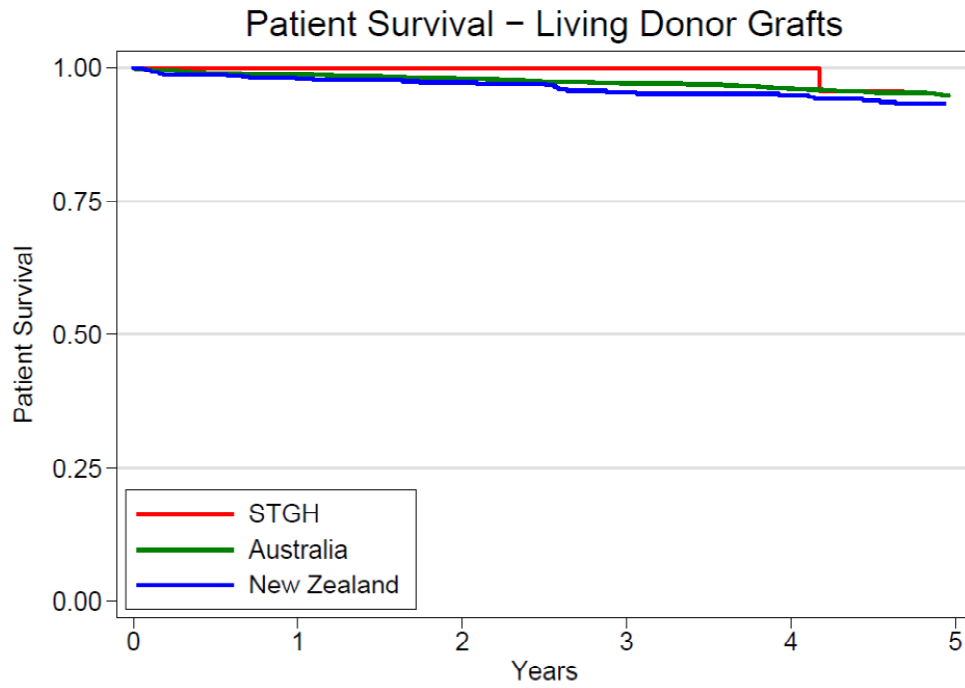
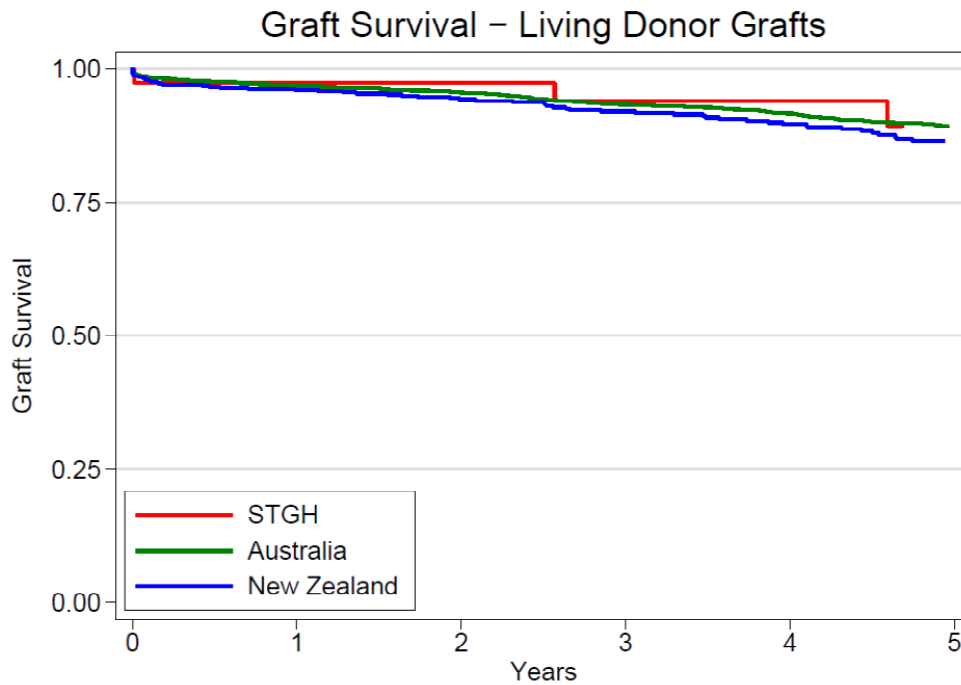


Table 18: Graft survival of primary living donor grafts.

Time	STGH		Australia		New Zealand	
	n	% Survival (95% CI)	n	% Survival (95% CI)	n	% Survival (95% CI)
0	37	100.0	2559	100.0	539	100.0
3 months	34	97.3 (82.3-99.6)	2454	98.1 (97.5-98.5)	511	97.0 (95.2-98.2)
6 months	33	97.3 (82.3-99.6)	2386	97.5 (96.8-98.0)	494	96.6 (94.7-97.9)
1 year	33	97.3 (82.3-99.6)	2262	96.9 (96.1-97.5)	468	96.0 (94.0-97.4)
2 years	30	97.3 (82.3-99.6)	1989	95.6 (94.7-96.3)	406	94.3 (91.8-96.0)
3 years	27	93.9 (77.7-98.5)	1683	93.4 (92.2-94.3)	346	92.0 (89.2-94.2)
4 years	23	93.9 (77.7-98.5)	1388	91.6 (90.3-92.7)	285	89.7 (86.4-92.2)
5 years	18	89.2 (69.3-96.5)	1153	89.3 (87.8-90.6)	228	86.6 (82.7-89.6)



Patient deaths

There were 8 deaths (11%) of SGH patients out of a total 72 transplants carried out from 2006 – 2011. Figures for the whole of Australia report 196 deaths out of a total 4054 transplants (5%) over the same time period.

- 2 cardiac
- 1 malignancy
- 3 infection
- 2 other

Causes of Graft failure:

Table 20: Cause of graft failure

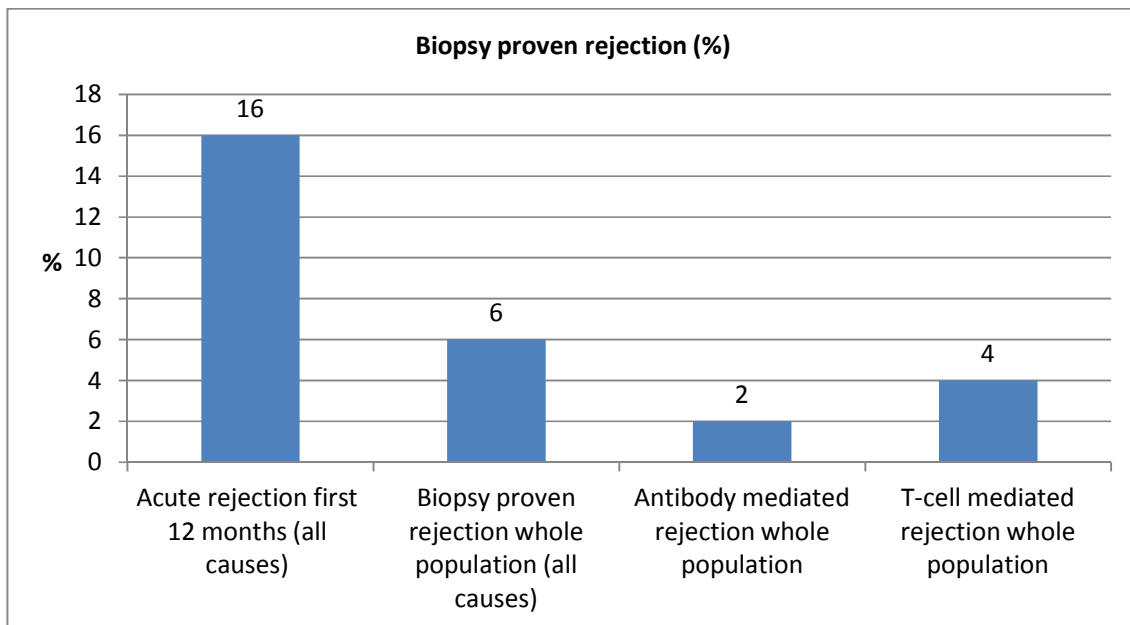
	STGH	Australia	New Zealand
Total Failures	26	1332	259
Acute Rejection	3 (12.0)	118 (8.9)	26 (10.1)
CAN	8 (32.0)	371 (28.0)	50 (19.4)
Vascular/Technical	3 (12.0)	129 (9.7)	28 (10.9)
Recurrent Disease	0 (0.0)	61 (4.6)	18 (7.0)
Other	1 (4.0)	125 (9.4)	26 (10.1)
Death with Function	10 (40.0)	523 (39.4)	110 (42.6)

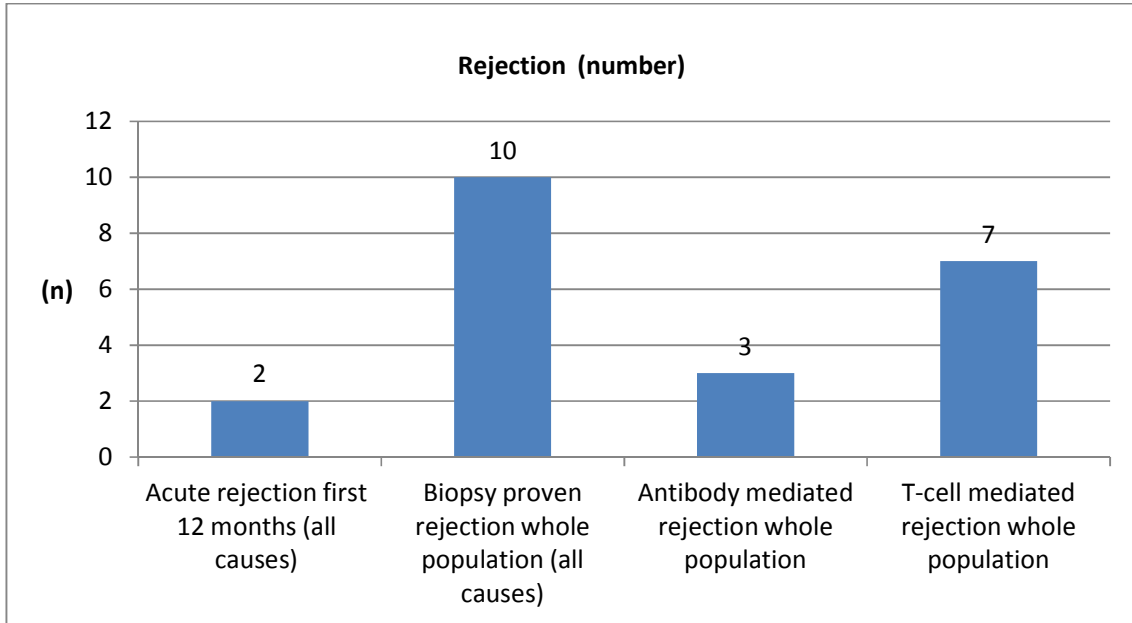
(Figures based on ANZDATA report 2006-2011 Transplantation SGH as caring hospital)

REJECTION

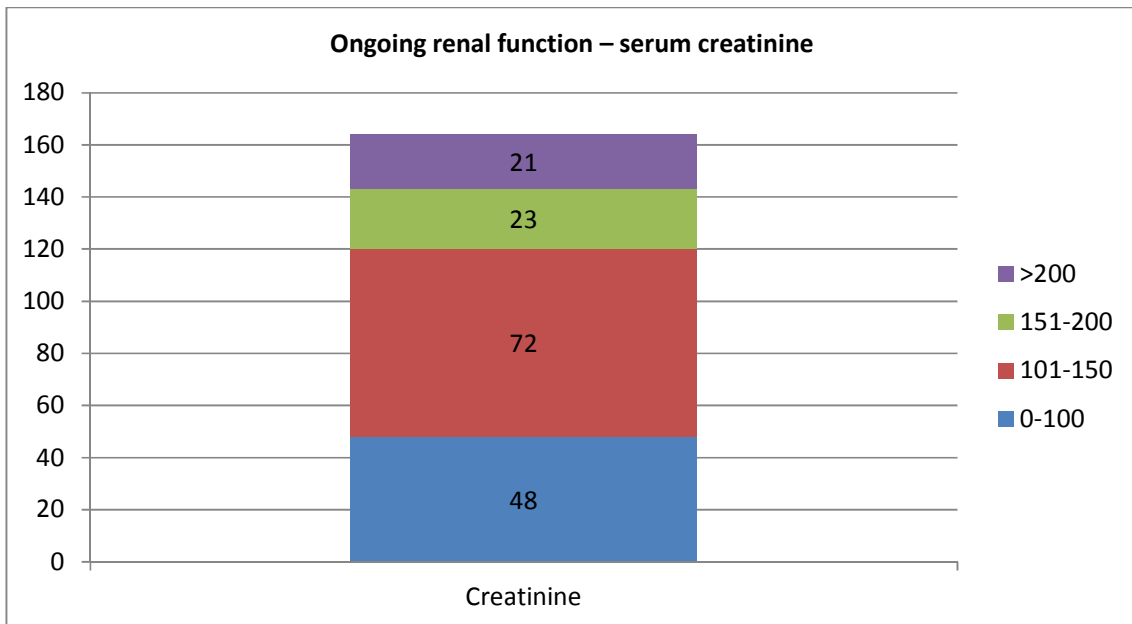
KPI: Episodes of biopsy proven acute rejection within first 12 months <30%

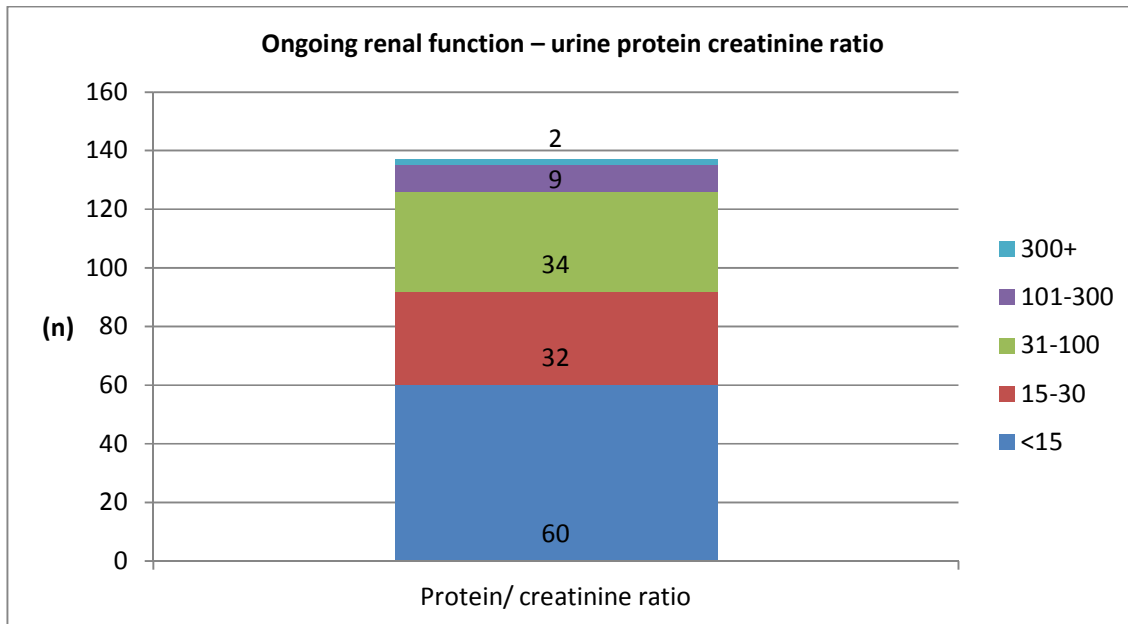
(Based on the 12 patients transplanted 2011 completing their first year of transplant 2012)





Ongoing renal function (all patients, n=164)

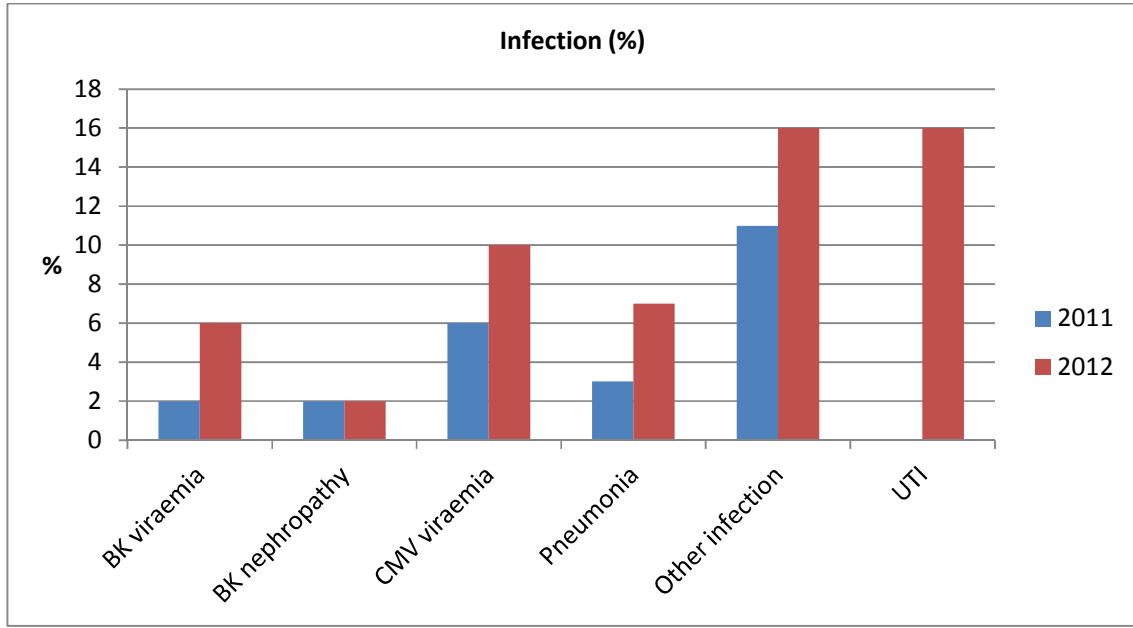




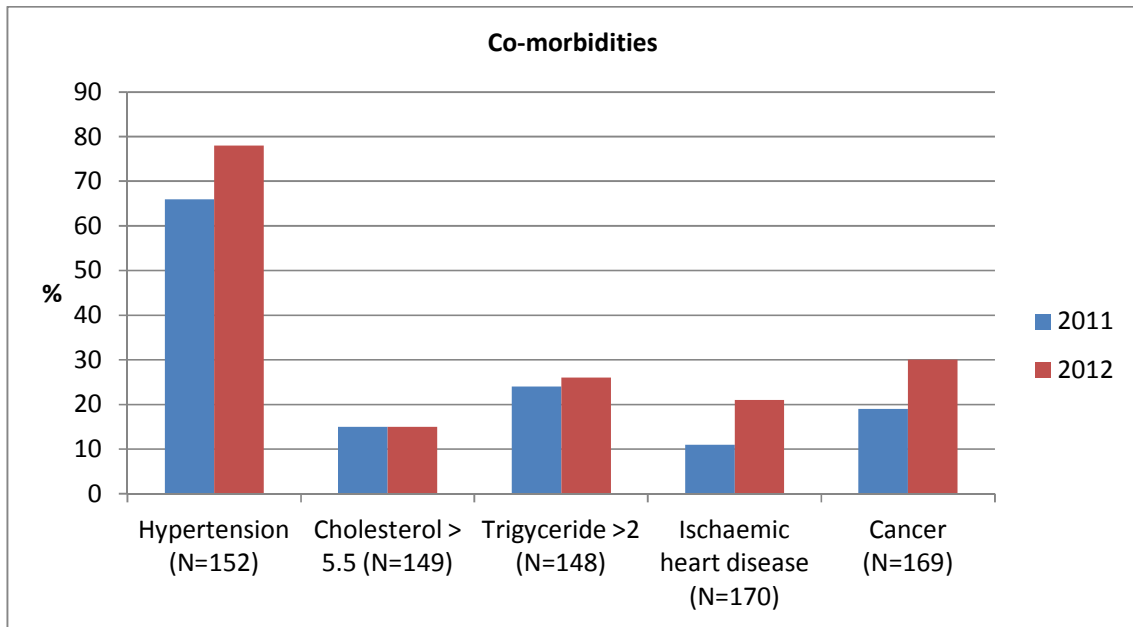
Infection

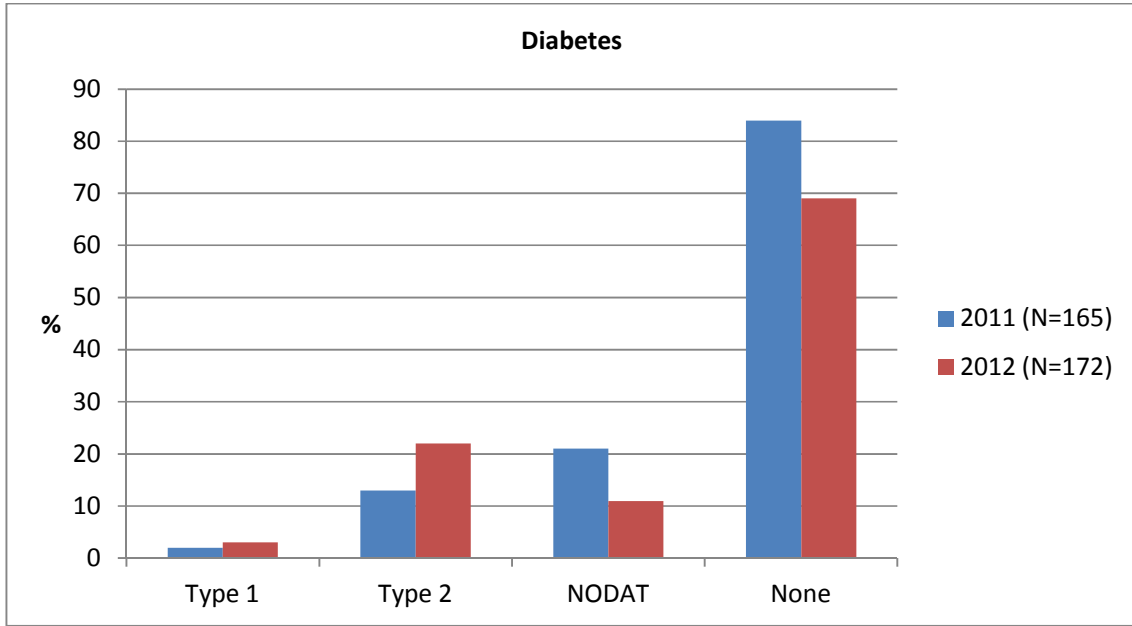
During 2012

- 77 SGH transplant patients were screened for CMV PCR viraemia
 - 17 positive (22% of patients screened).
- 60 SGH transplant patients were screened for BK DNA viraemia.
 - 10 positive (17% of patients screened).
- 4 patients had BK nephropathy on biopsy, all within the first 12 months after transplant.
- 28 of the 174 patients (16%) had urinary tract infections,
- 13 (7%) had pneumonia
- 28 (16%) had other infections including c-difficile and various bacteraemias.

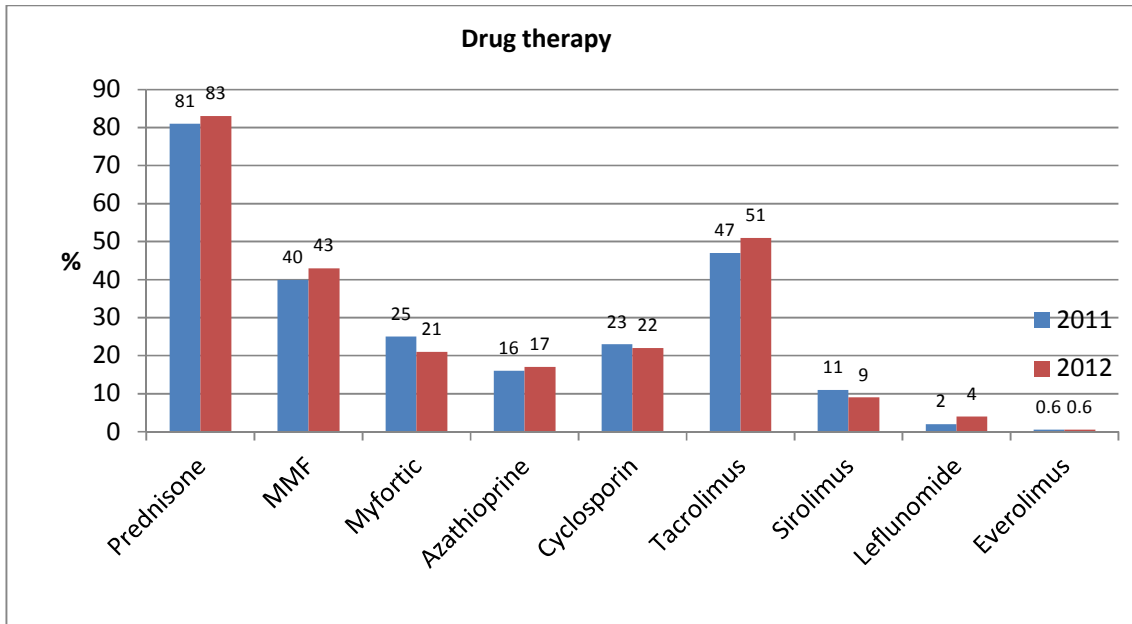


Long term follow up



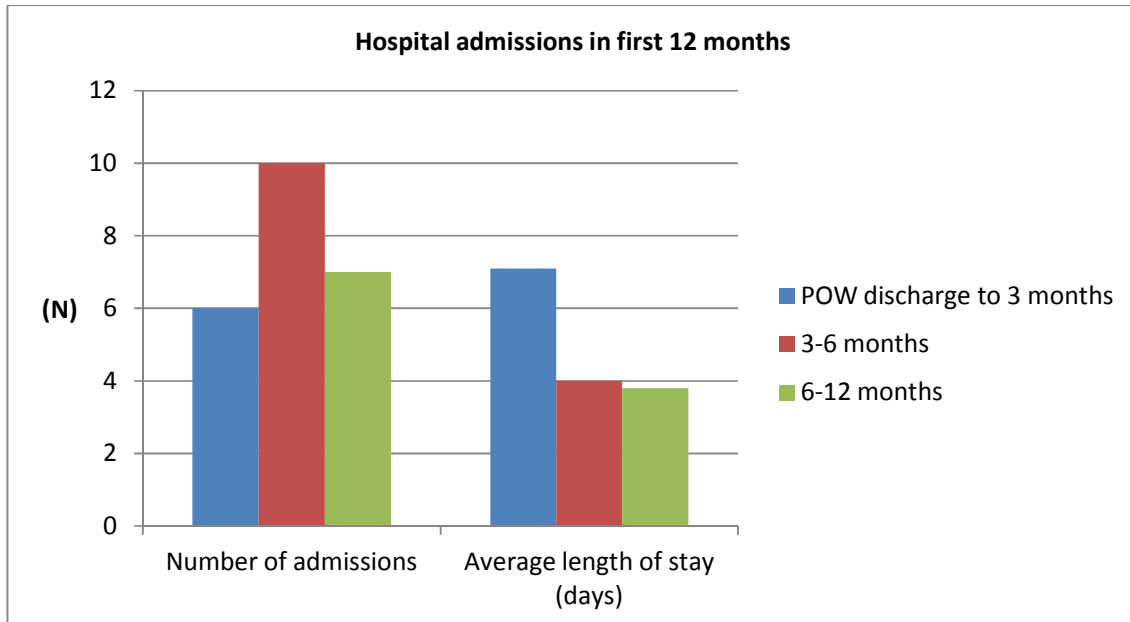


NODAT = New onset diabetes after transplant



Hospital admissions in first 12 months

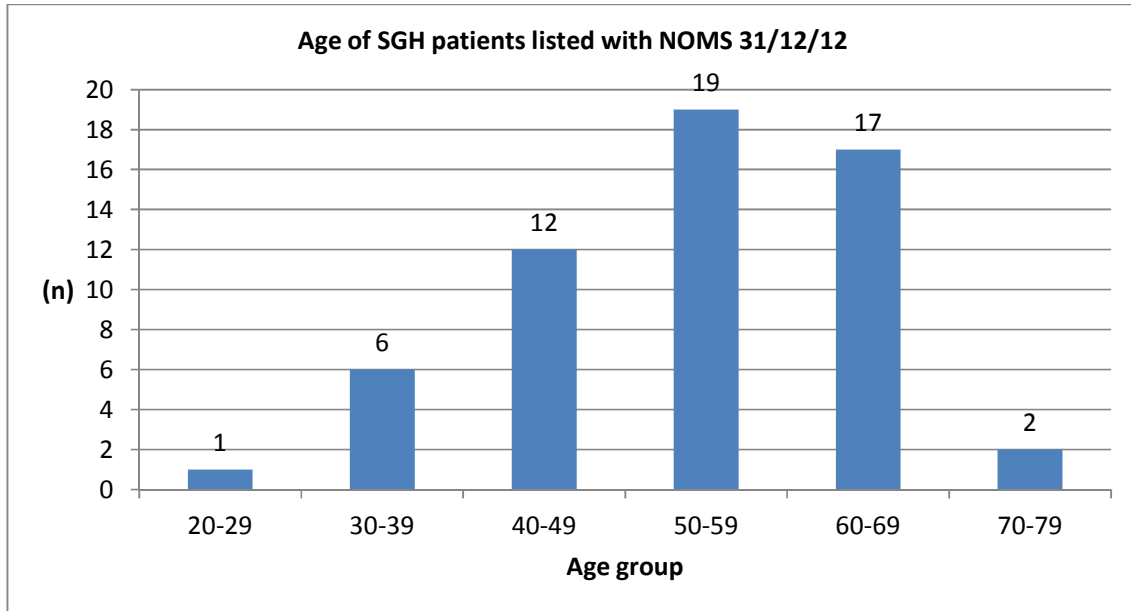
(Based on the 12 patients transplanted 2011 completing their first year of transplant 2012)



These data do not include admissions for twelve biopsies done routinely at 3 months and 12 months and involving an overnight stay on each occasion. They also do not include one admission of 122 days in the 3-6 months period.

Waiting list data

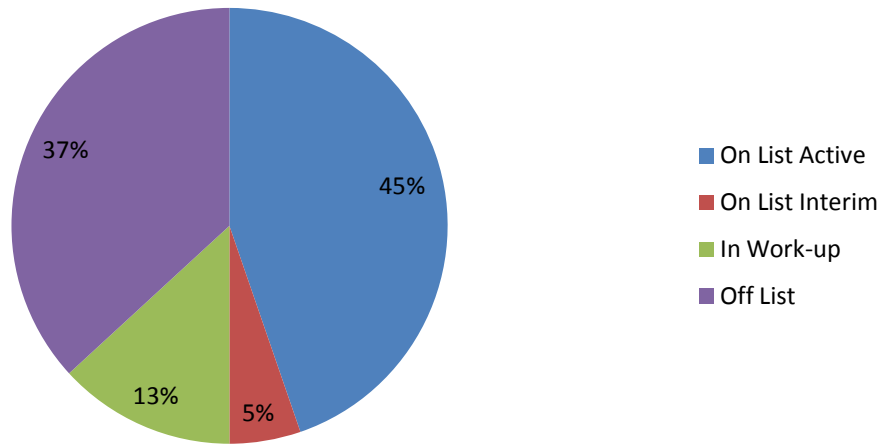
At the end of 2012 there were 57 SGH patients listed on the National Organ Matching Service (NOMS) list. They were aged 28 – 70 years and had been on dialysis 6 months – 13 years. 55 were waiting for their first graft and 2 for their second.



More detailed investigation has been carried out into how many of the patients aged 25-55 years old on renal replacement therapy are listed for transplant.

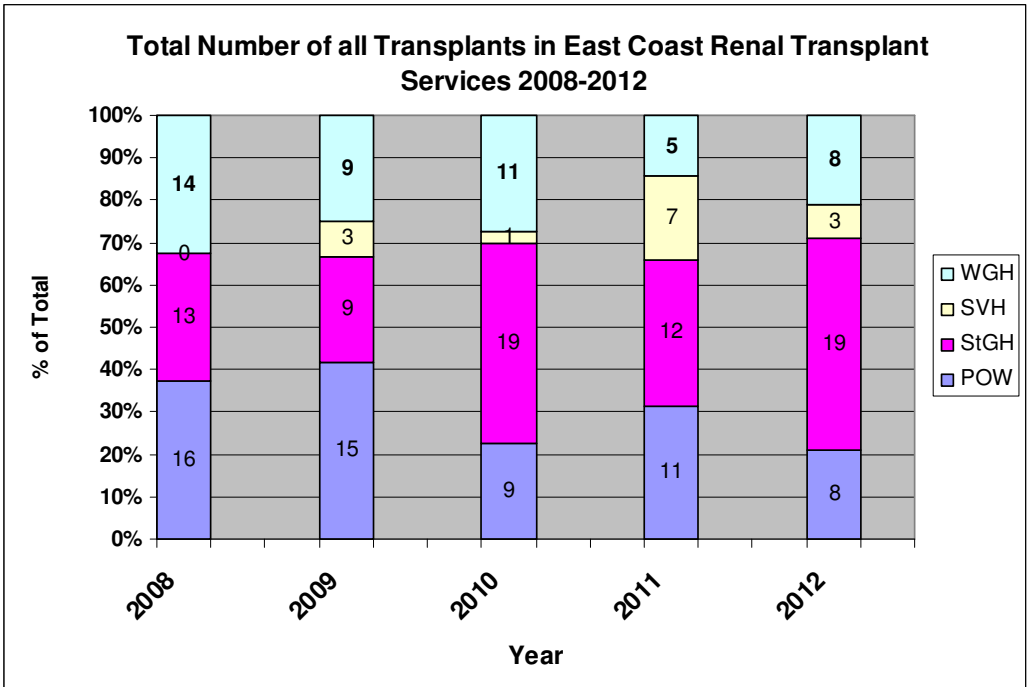
- 63% are listed or in work-up;
- The remaining 37% have specific medical or psychological reasons why they are not suitable for transplant.
- Every patient in this age group has been considered for transplantation

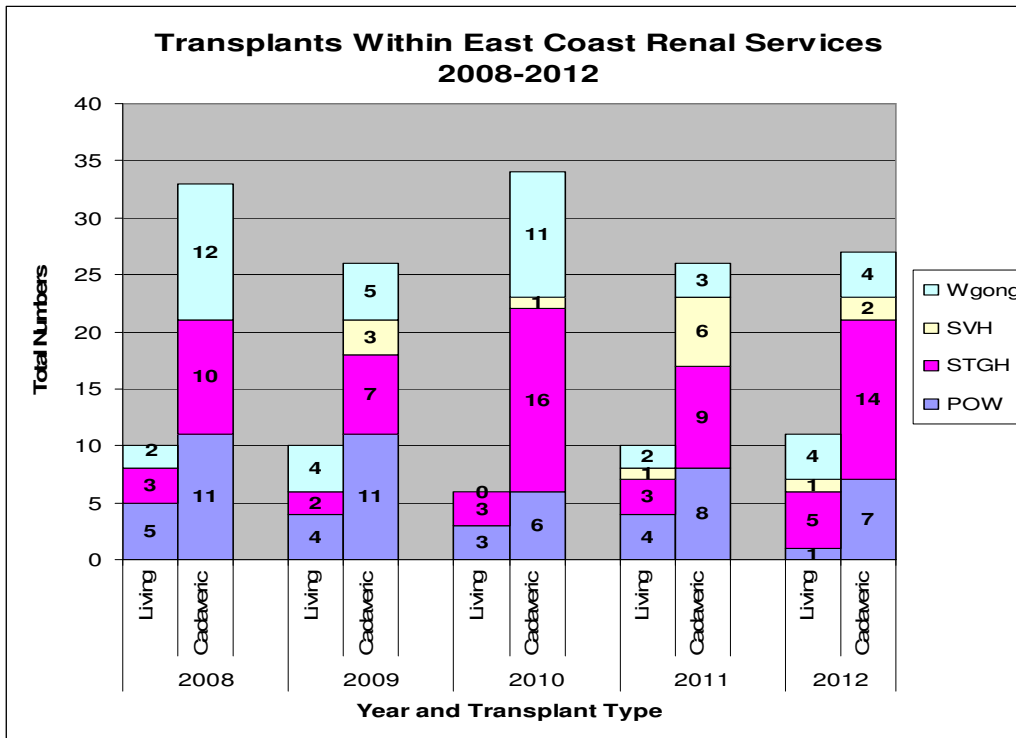
St George patients 25-55yrs on RRT pre-transplant status Dec 2011



LIVE DONOR REPORT 2012

Total Number of all Transplants in East Coast Renal Transplant Services 2008-2012

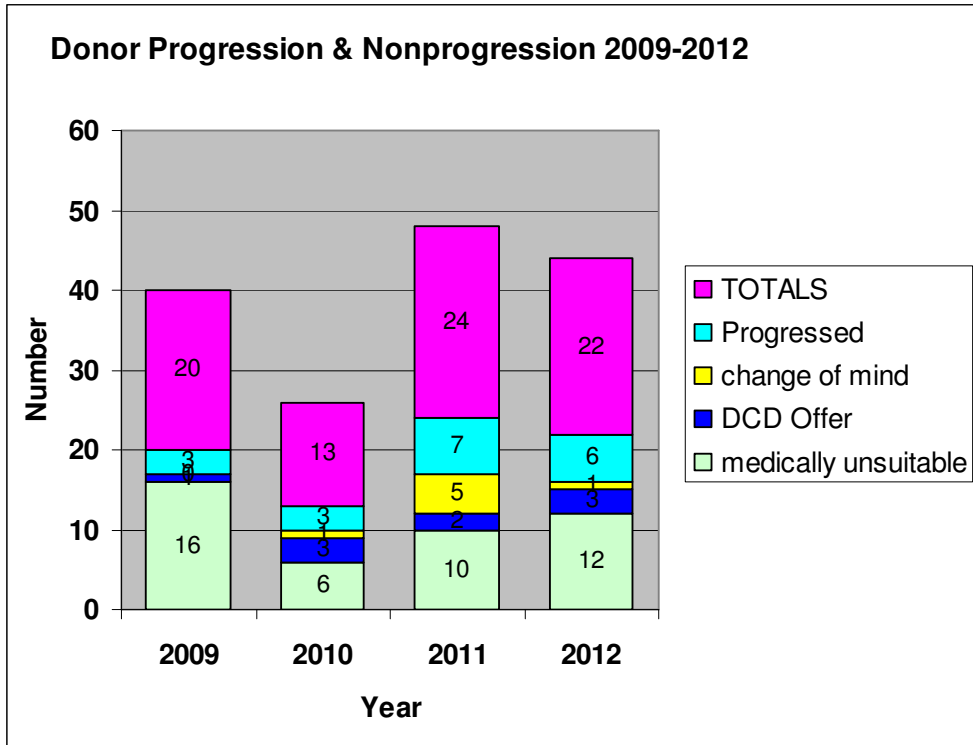




Donor Progression and Non-Progression

Assessed 2009 - 2012

- 2009-2012: 16 patients have medically progressed as renal donors and 14 have undergone donation (lag time between progression and donation)
- 44 (56%) patients have been found to be medically unsuitable to progress as renal donors.
- 8 (10%) donors had a change of mind.
- In addition; 9 donor assessments were suspended when recipient received deceased donor transplant



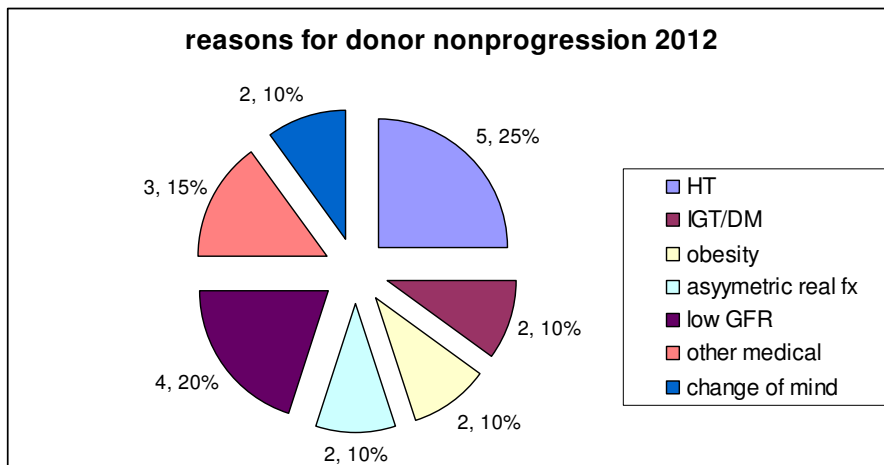
Donor Non-Progression

Rates of non-progression vary from year to year and range from 42 to 80%. Due to small overall numbers the percentages change dramatically.

In 2012 the donor non-progression rate was at 55% (12/22).

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

A summary of the major reasons for non progression in 2012 are listed in the pie chart overpage/below.



Progressive Reasons for Donor Non-Progression

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

ABO incompatible/ X-match positive

In 2012 there were no ABO incompatible or Xmatch positive donor/recipient pairs. No recipients required desensitisation and there were no transplants through the Australian Paired Kidney Exchange Program.

Complex Donors

Due to shortage of donors the number of complex (previously termed 'marginal') donors are increasing with five of the seven live donors (71%) having at least one complexity in their assessment including such issues as hypertension and a history of stone disease.

Long-Term Donor Follow-Up

- 28 (57%) live donors are followed-up in the donor clinic, these date back as far as 1999.
- 4 live donors have been lost to follow-up and can not be contacted.
- A further 14 live donors are follow-ed up in the private sector. These patients are difficult to access data for ANZDATA follow-up and a better long term solution is required for data management.

- Of the Donors Followed in The Public Clinic
 - Age range : 39-72 years of age
 - Average age at donation 50 years
 - 38% of donors are male
 - Relationship to Recipient – 31% mother; 24% spouse (unrelated), 14% father; 0.03% altruistic and the remaining 30% are represented by siblings, children and cousins
 - Using eGFR (for monitoring purposes only), donor renal function has an average fall of 38% at 3 months post donation 31-49ml/min.

Donor Database

Public Follow-Up	28
Private Follow-Up	14
Officially Transferred Care	3
Lost to follow-Up	4

Summary

1. We are meeting all standards for assessment of patients entering the transplant list and have not missed screening any potential transplant recipients.
2. We are meeting benchmarks for early (within 12 month) transplant complications including rejection and infections and BKVAN.
3. Long term cardiovascular risks are well managed overall
4. NODAT rates are low
5. The major concern is the possibility that death rates are increasing in the 2006-2011 period; although these are not statistically different from the National average they are numerically lower and we aim to do better. Strategies include:
 - a. Departmental review of every transplant patient death
 - b. Transplant group review of all patients with loss of graft function annually
 - i. The focus of these 2 reviews will be to determine whether the case could have been managed differently or whether the patient selection was appropriate in retrospect in order to learn for future cases.
 - c. Transplant group to review with individual nephrologist any patient with a loss of graft function or increased proteinuria since the prior annual review.
 - d. Invite a transplant nephrologist from POW to attend the Friday clinic review of acute transplant patients.

Renal Supportive Care Clinic

Overview

The renal department has been working closely from 2009 to 2012 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.

The **Renal Supportive Care Clinic (RSC)** commenced in March 2009, it increased from bi weekly clinics to weekly clinics in December 2010, and then added a small overflow clinic on some Fridays from August 2011. It is staffed by Dr Frank Brennan, a renal registrar, renal supportive care clinical nurse consultant and a research assistant. The clinic also receives support from the renal social worker and dietician.

The third **Renal Supportive Care Symposium** was held on 10th August 2012. 190 Doctors, nurses and allied health attended from around Australia and New Zealand in 2010, 150 in 2011 and 100 in 2012.

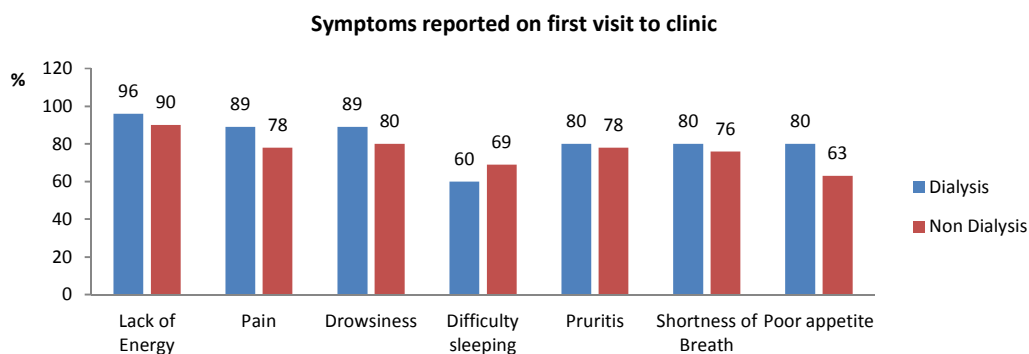
The renal department website has a dedicated palliative care section which includes details of current research, guidelines, patient information, education and presentations.

The second annual **Renal Memorial Service** was held in April 2012 and was attended by approximately 25 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, coordinated by Hannah Burgess the renal social worker.

Clinic Attendances and Outcomes

There were 110 visits to the clinic from March 09 to Dec 09, 218 visits in 2010, 403 visits in 2011 and 498 visits in 2012. The age of patients ranged from 24-96 years, average 78 years, 60% male..

Symptoms reported on the first visit when comparing dialysis patients and conservatively managed (non dialysis) patients attending clinic show a high symptom burden all end stage kidney disease patients.



Symptoms reported on the first visit to the supportive care clinic using the MSAS survey 2009-2012

There are 3 main categories of patients who use the services of the renal supportive care clinic; conservative care support, dialysis (or pre dialysis) symptom support and support for those who may be withdrawing from dialysis following a major sentinel event or by choice. Below is a flow chart which shows patient outcomes up to December 2012.

Inpatient consultation

The service sees an average of 24 inpatients per month with an average of four new referrals per month. The majority of new referrals are for pain and symptom management.

Outpatient services

Telephone consultations commenced in 2012 to assist patients who are too frail to physically attend the clinic..

Home Visits

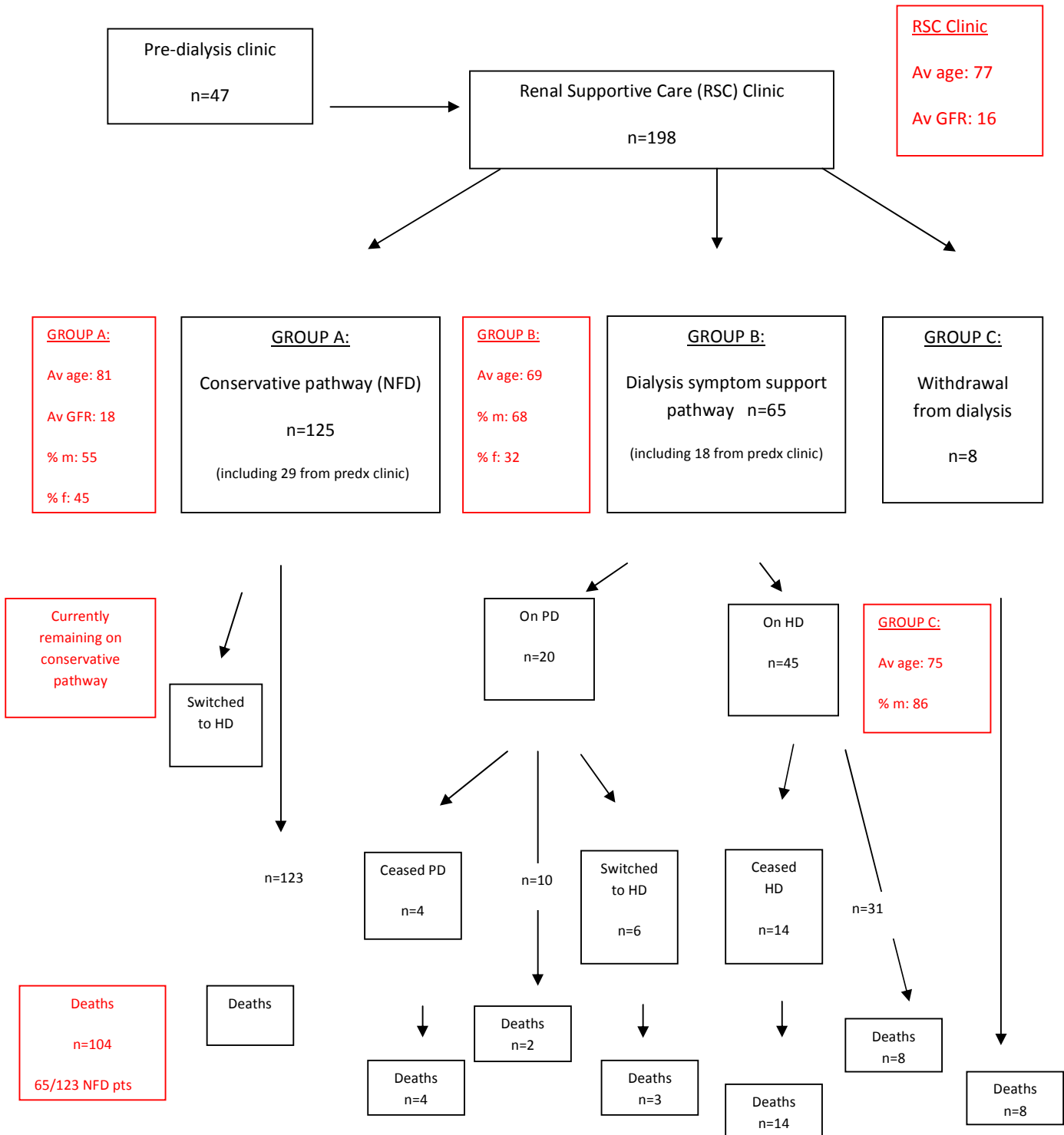
Home visits by the renal supportive care CNC commenced December 4th, 2012. These aim to support the patient and family, allow for a nursing assessment, symptom assessment and appropriate referral to allied health or other services where required.

Pathways of patients who attended Pre-dialysis and Renal Supportive Care clinics (March 2009 – December 2012)

GROUP A: RSC clinic- conservative pathway

GROUP B: RSC clinic- symptom support on dialysis

GROUP C: RSC clinic- withdrawal from dialysis



Summary

The RSC clinic offers holistic service to end stage renal failure patients and their families to reduce symptom burden, improve quality of life and provide 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 clinic is well utilized by the renal patients evident by the growth in the clinic visits and the increased number of clinics.

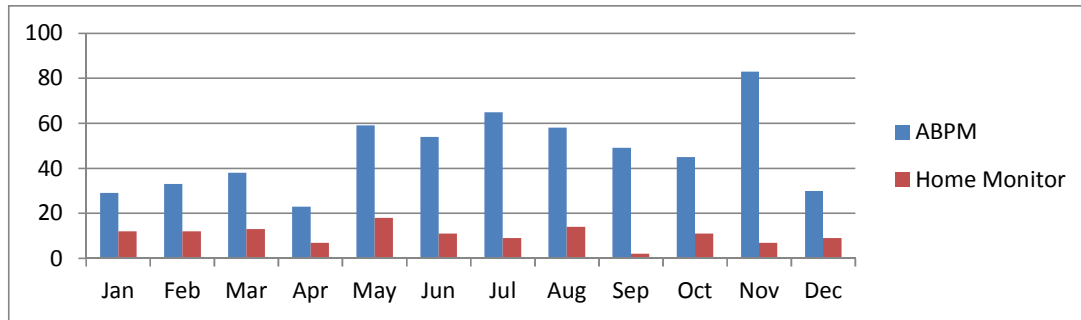
Hypertension Unit

24 hr Ambulatory BP Monitoring

For 2012 this unit attended to 566 ABPMs, compared to 386 last year (32% increase).

Home BP devices validation

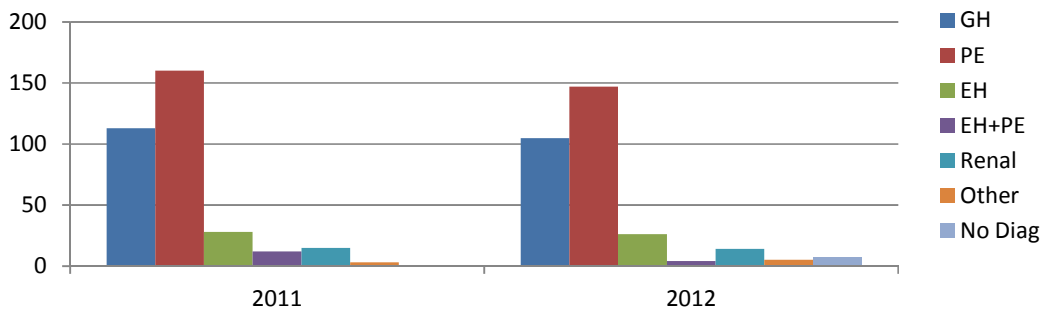
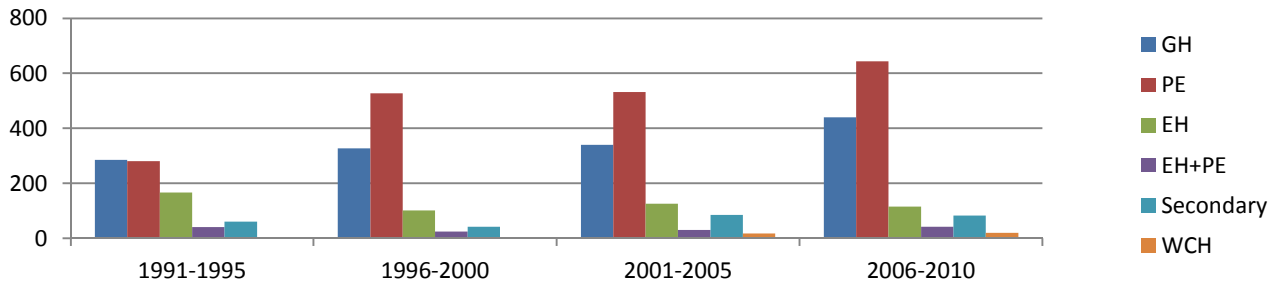
Another important service is that of validating home blood pressure measuring machines for accuracy; 125 home monitor checks have been attended this year. Patients are encouraged to have their home monitors checked on a yearly basis.



Hypertension in Pregnancy

Written By Jennifer Beddoe

Our database includes 4965 records of women who had hypertension in pregnancy or known renal disease from 1987. The distribution of diagnoses is graphed below, pre-eclampsia remaining the most common diagnosis.



Outcomes in 2012

- 308 Pregnancies were recorded for 2012, 291 Singleton & 17 Twins
- Total no of Babies = 325
- 16 women were admitted to ICU2, 15 for anti-convulsant therapy (IV MgSO₄) & one for an unknown cause
- There was 1 case of eclampsia (0.3%) in a woman who presented 8 days post delivery.
- No women with pre-eclampsia required dialysis
- 224 (73%) of these women were consulted to the renal team.
 - The remaining 84 women were managed by the obstetric team.
- There were no maternal deaths
- There were 2 fetal deaths & 1 neonatal death (overall perinatal mortality 9/1000).
- 9 women were transferred to a level 3 facility for delivery

Overall these data show excellent outcomes for mother and baby with our current management protocols.

Renal Biopsies

Renal biopsy data for the year 2012

	Jan-Dec 2012 (all)	Jan-Dec 2012 (transplant only)
Number of biopsies	86	28(34%)
Total complications	6 (7%)	0
Macroscopic hematuria	3(3.5%)	0
Symptomatic perinephric haematoma	3 (3.5%)	0
Transfusion	4 (4.7%)	0
Embolisation	0	0

Four of the six patients with complications required blood transfusion. One of these had a hematoma and all the other three had gross hematuria.

There were no complications in the renal transplant recipients.

Comparison of complication rates from previous years

	2006	2007	2008	2009	2010	2011	2012
Total Number	77	58	67	106	85	107	86
Complication rate	6%	9%	9%	9.4%	11.8%	10.2%	7%

Comparison of specific complications expressed as % (n)

Year	2009	2010	2011	2012	TOTAL
N	N=107	N=85	N=109	N=86	(n=387)
(Year Total %)	(7.5%)	(9.4%)	(10%)	(7%)	
Gross Hematuria, %(n)	1(1)	4.7(4)	4.6(5)	3.5(3)	3.4% (13)
Haematoma, %(n)	5.6(6)	4.7 (4)	4.6 (5)	3.5 (3)	4.7% (18)
Angio embolisation, %(n)	1.9(2)	0	0	0	0.5% (2)
Pain post procedure, %(n)	5.6(6)	6.8(2)	NA	NA	
Required blood transfusion	2.8(3)	0	1(1)	4.7(4)	2.0% (8)

Between Jan 2009 and Dec 2012 there were **383 biopsies with 33 complications (8.6%)**.

The complication rate seemed to be better in 2012, although not statistically.

Our benchmarks (*Am J Kidney Dis.* 60(1):62-73.2012) are:

- Macroscopic hematuria 3.5% - **Met**
- Blood transfusion 1% - **NOT met**
- Angio-embolisation 0.6% - **met**
- There is no benchmark for symptomatic perinephric hematoma

Education Program Sponsors for 2012

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Jansen-Cilag

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