The St George Hospital Renal Department

2006 Annual Report

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Cover photo: The General Electric (GE) Logiq book mobile ultrasound machine was purchased with proceeds from the Rotary Club of Sutherland's charity golf day.

Contents

AIM

The aims of the quality assurance activities contained in this annual report are:

1. To compare our unit's performance for the management of dialysis patients against the national recommended guidelines (CARI: Caring for Australians with Renal Impairment) for the following parameters: Ca, PO4, Corrected Ca, Ca PO4 product, Albumin, Mg, Hb, Fe studies, Bicarbonate, Lipids and dialysis adequacy.

2. Compare our unit's water quality to AAMI standards.

3. To compare vascular access against the National Kidney foundation Kidney Disease Outcomes Quality Initiative (KDOQI) 2006. As well as monitoring and reporting central venous catheter infection and complication rates.

4. Monitor and report peritonitis and peritoneal dialysis exit site infection rates and compare these with national data.

5. Collect data on the characteristics of patients accepted onto dialysis and compare our population with data from the 29th ANZDATA *(Australia and New Zealand Dialysis and Transplantation Registry)* Report 2006. The ANZDATA 2006 annual report contains data up to the 31st December 2005.

6. Collect data on the renal biopsies performed at St George Hospital. Data collected includes: patient characteristics, biopsy adequacy, complications and nights in hospital.

7. Provide a report on any ongoing or completed research projects undertaken by the Quality Assurance staff.

8. Provide a comprehensive nutrition report by the dietitian.

9. Report the progress and advantages of the renal specific IT available to the renal unit such as the RISC program.

10. Report Chronic Kidney Disease (CKD) clinic activities.

Executive Summary

- The peritoneal dialysis unit has had a minimal decrease in total patient numbers over 2006 with a total of 65 patients being treated compared to 67 in 2005. The trend in peritoneal dialysis continues to show an increase in numbers of patients on APD (an increase of 18%), which is considerably higher than the trend reported by ANZDATA (3% increase in APD numbers reported)

- Compared to the previous years, in 2006 peritoneal dialysis accepted a fairly even distribution of patients from most age groups corresponding to the data published by ANZDATA. There has been an increase in the 25-44 and 65-84 year age groups and a decrease in the 45-64 year age group.

- There are a higher proportion of patients on APD who are peritonitis free (60% compared to 47% on CAPD), but there is no statistical evidence to suggest an association between peritoneal dialysis mode (APD or CAPD) and peritonitis.

- ANZDATA provided survival date showing St George median time to first peritonitis is similar to the rest of Australia.

- The dialysis patients were surveyed for quality of life using the Short Form 36 questionnaire. Results show a continuing trend for our dialysis patients to have poor self reported quality of life. This is in keeping with published literature. As a result we are trailing a palliative care intervention to improve QoL.

- The Chronic Kidney Disease (CKD) clinic is held on 4 west on a Wednesday morning. The clinic is coordinated by the Renal Clinical Nurse Consultant (CNC), Shelley Tranter and operates on a one on one basis with chronic kidney disease patients and their important others. From January to December 2006, there were 39 new attendees; 23 males, 16 females.

- There were 12 transplants in St George Hospital in 2006; 8 deceased donor grafts and 4 living related.

- The 4West haemodialysis unit showed a smaller growth activity for 2006 (1%) compared to 2005 (3%). As of 31st December 2006, there were 141 chronic patients receiving incentre haemodialysis and 51 patients undergoing haemodialysis at home. Fourteen patients commenced home haemodialysis training which was a large increase from previous years. St George has the second highest number of home haemodialysis patients in the state at 27%. The proportion of home haemodialysis patients in NSW is 16%.

- The patients accepted onto dialysis during 2006 were examined. There was a greater rate of late referrals compared to previous audits i.e. patients who were referred to nephrologists less than three months prior to commencing dialysis. Although the late referral rate is the similar to the ANZDATA 2006 report. The average age of patients commencing haemodialysis in 2006 was 60, with a median age of 51. There were more males starting haemodialysis in

2006 and the incidence of co morbidities was either similar or lower than ANZDATA.

- A Vascular Access Nurse was appointed part time to improve the co-ordination of haemodialysis access. Through collaborating with the nephrologists and vascular surgeons a greater number of patients had functioning fistulas than previous audits and the ANZDATA 2006 report. The number of central venous catheters in use was lower than in previous years. Additionally, the cannulation technique of Buttonhole was established on 20 patients to prevent aneurysm formation and infiltration and hence improve the longevity of the fistula.

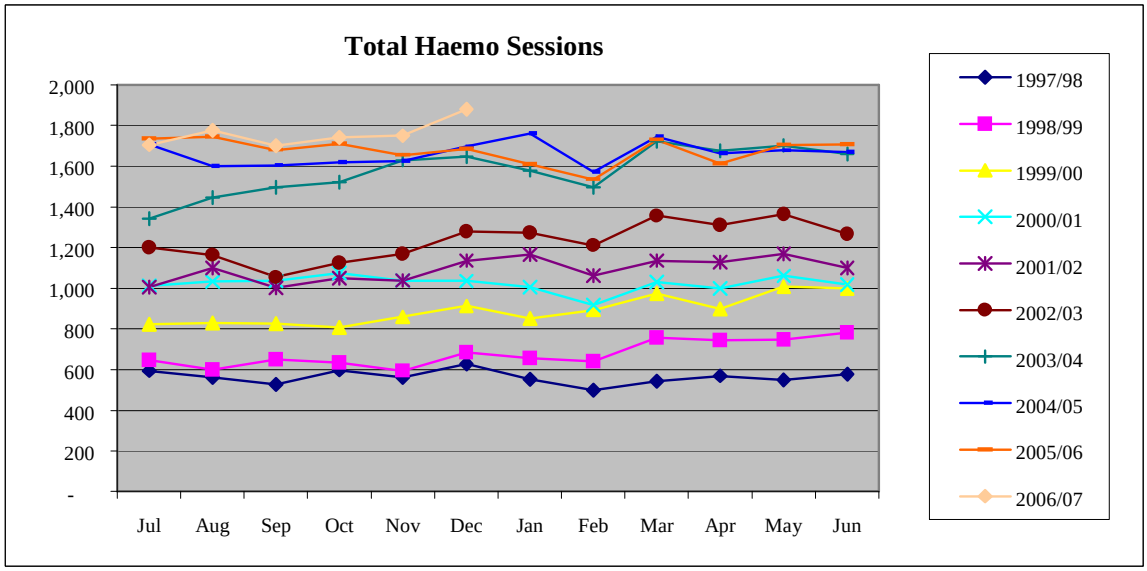
- Through the implementation of a prophylactic gentamicin and heparin lock protocol to all haemodialysis catheters, reduced catheter related infection rates occurred. This resulted in reduced hospital admissions and decontaminations for catheter infections.

- The nurse initiated maintenance iron program's aim is for all haemodialysis patient's to have replete iron stores, thereby ensuring effective use of Erythropoietin therapy and maximization of target haemoglobin levels. The nurse initiated IV iron protocol has continued to improved iron stores since implementing the program in September 2004. Audits of the protocol occur biannually and changes are made accordingly.

- Recruitment for the Ideal Study continues. This multi centred randomised control study aims to determine the best time for adults with kidney disease to start dialysis. During 2006, five patients were recruited. Three were randomized to commence dialysis early. Two patients have commenced incentre haemodialysis and one commenced home haemodialysis. The remaining two patients are yet to start dialysis. A total of 14 active patients are currently in the Ideal study.

HAEMODIALYSIS

The total Haemodialysis activity level for 4 West increased from 20,300 dialyses in 2005 to 20,457 in 2006 resulting in a 1% increase in activity. This result shows a smaller growth in activity compared to the same period last year (3%).



Patient Flow:

Incentre haemodialysis patients 01/01/06		**128**
IN	New patients	39
	Transfers from other units	1
	Temporary transfer from PD	2
	Permanent transfers from PD	15
	Failed transplants	3
	Transfer from Home HDx	1
Subtotal		**61**
Out	Transplants	4
	Transfers to other units	5
	Transfers to Home HDx	6
	Transfers overseas	1
	Transfers to PD	4
	Deaths (medical causes)	15
	Deaths (withdrawal from dialysis)	13
Subtotal		**48**
Net gain		**13**
Incentre haemodialysis patients 31/12/06		**141**

Home haemodialysis patients 01/01/06		**45**
IN	New patients	7
	Transfers from PD	1
	Transfers from incentre HDx	6
Out	Transplanted	7
	Transfers to incentre HDx	1
Net gain		**6**
Home haemodialysis patients 31/12/06		**51**

Comments

- A lower death rate from medical causes (5%) occurred in 2006 than the ANZDATA 2006 report (14%). Whilst death due to withdrawal from haemodialysis was higher at St George (7%) compared to ANZDATA (4%).
- Home haemodialysis activity includes two satellite patients dialyzing in Dubbo base Hospital.
- Twenty six percent of haemodialysis patients are dialyzing at home compared to 12% as stated in the ANZDATA report and 16% in NSW.

ACCEPTANCE ONTO HAEMODIALYSIS

Background

- The data for this audit consisted of patients who commenced incentre and home haemodialysis in 2006.

How did we Record, Store and Analyse the Data?

- Data was collected from ANZDATA forms, dialysis patient files, Doctors letters and medical records.
- Data was entered into an Excel database by the Quality Assurance and Research nurse.
- Data was collected on:
  - GFR using Cockcroft-Gault formula corrected for BSA
  - Co-morbidities
  - Gender
  - Age
  - Ethnicity
  - BMI
  - Late referrals (< 3 months pre dialysis)
  - Who had a functioning fistula at entry

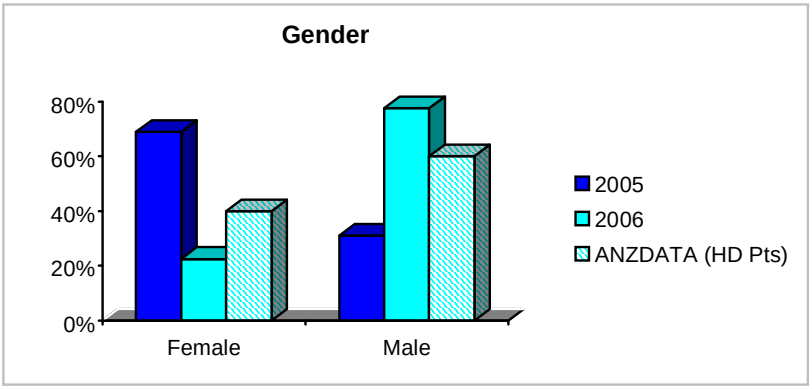
Data Benchmark

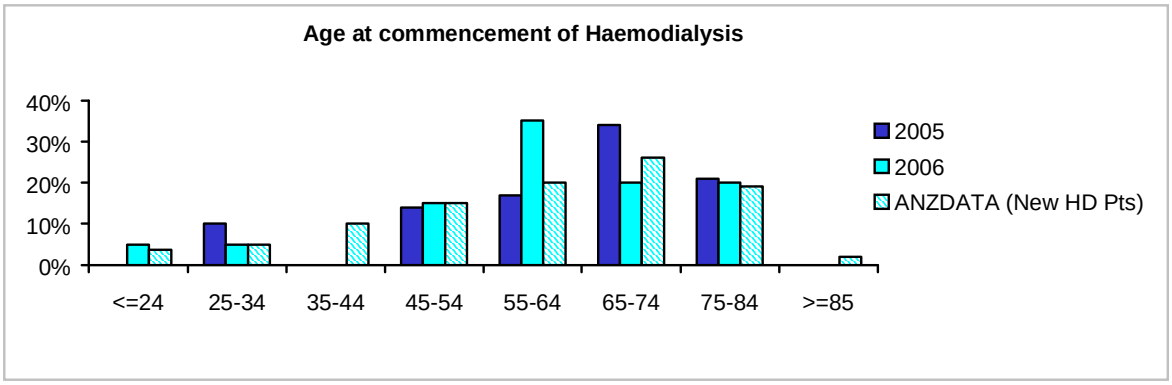
- Audit results are compared to the previous audits and ANZDATA 2006 report.

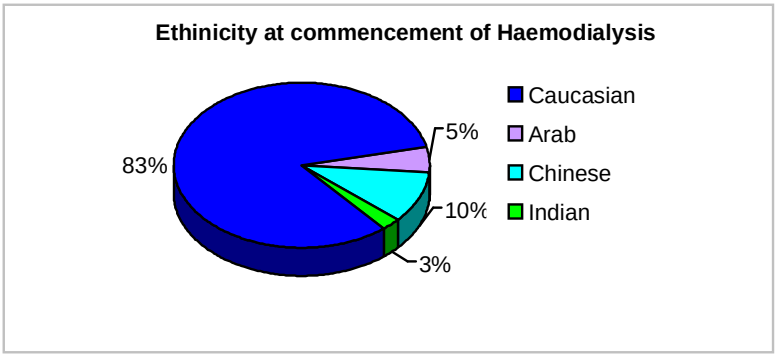
Activity

- 41 patients commenced incentre or home haemodialysis for ESRD with no previous dialysis in 2006 (excludes patients from PD, failed transplant patients and patients dialysed for <1month).

Outcomes

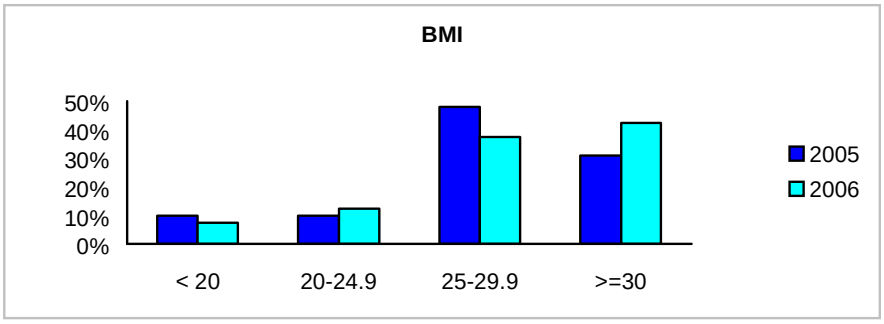




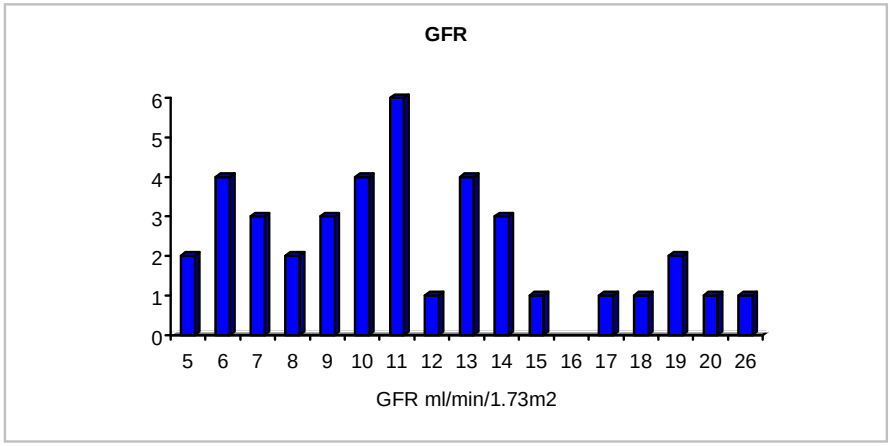


Co-morbidities present at commencement of haemodialysis

Co-morbidity	St George 2005	St George 2006	ANZDATA (HD pts)
Chronic Lung Disease			
▪ Yes	17%	12.5%	13%
▪ Suspected	0%	0%	3%
▪ No	83%	87.5%	84%
Coronary Artery Disease			
▪ Yes	48%	27.5%	36%
▪ Suspected	7%	10%	8%
▪ No	45%	55%	57%
Peripheral Vascular Disease			
▪ Yes	24%	12.5%	20%
▪ Suspected	0%	0%	6%
▪ No	76%	82.5%	74%
Cerebrovascular Disease			
▪ Yes	31%	7.5%	12.5%
▪ Suspected	0%	2.5%	3%
▪ No	69%	82.5%	85%
Diabetes			
▪ Yes	55%	45%	43%
▪ No	45%	55%	57%
Smoking			
▪ Never	45%	35%	45%
▪ Former	48%	45%	43%
▪ Current	<1%	20%	12%
Late Referral	10%	24%	25%



- BMI <20 indicates underweight, 25-29.9 overweight and ≥30 obese.



Comments

- The 55 – 64yr age group contains the largest percentage of patients commencing haemodialysis. Thirty five percent of patients fall into this group. New patients commencing haemodialysis at St George of age 65yr or older is 4% lower than ANZDATA 2006 report. The average age of patients commencing haemodialysis was 60yr, median age 51yr.
- Thirteen percent of patients were NESB.
- Overall co-morbidities are either similar or lower than ANZDATA 2006 report.
- The late referral rate reflects patients who were referred to nephrologists less than three months prior to commencing dialysis. An increase from 2005 was seen as a greater number of patients with acute renal failure and underlying renal disease occurred in 2006. Ten patients were considered as late referrals although the late referral rate was the same as ANZDATA 2006 report.
- The GFR is estimated by the Cockcroft-Gault formula not corrected for body surface area. The minimum GFR was 5ml/min/1.73 m^2, maximum 26.4ml/min/1.73 m^2. Average GFR was 7.35ml/min/1.73 m^2 with a median GFR of 10.5ml/min/1.73m^2.
- During 2006, five patients were recruited into the Ideal Study. The Ideal study aims to determine the best time to start dialysis. Three were randomized to commence dialysis early. Two patients have commenced incentre haemodialysis and one commenced home haemodialysis. The remaining two patients are yet to start dialysis. A total of 14 active patients are in the Ideal study.

Biochemical and haematological targets and dialysis adequacy audit.

Background and Activity Level

- Routine monthly bloods are attended on haemodialysis patients.
- Blood results were audited in October (from 127 chronic incentre haemodialysis patients) and April (from 125 chronic incentre haemodialysis patients) 2006.

Outcomes being measured

- Our aim is to compare our unit's performance against the National recommended guidelines (CARI) for the following parameters: Ca, PO4, Corrected Ca, Ca PO4 product, Albumin, Mg, Hb, Fe studies, Bicarbonate and dialysis adequacy (KT/V).
- Audit results are also compared to previous audit results and the ANZDATA 2006 report.
- Lipid target range is set by the National Heart Foundation for high risk patients

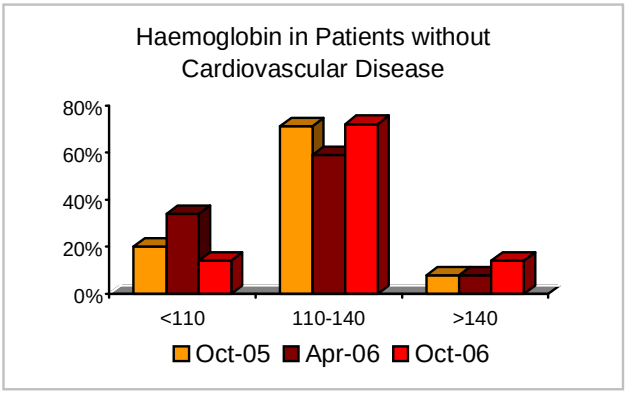
How did we Record, Store and Analyse the Data?

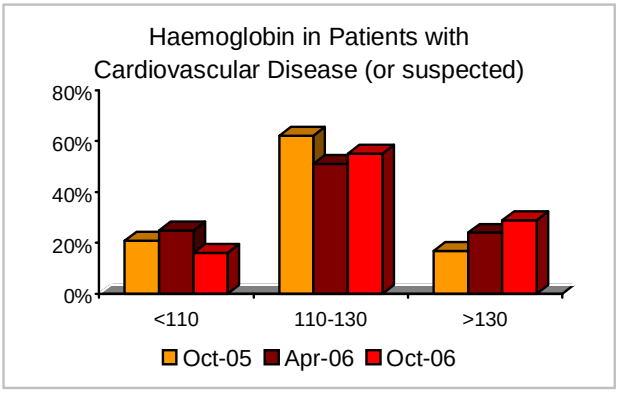
- Blood results were entered into an Excel Database.
- Analysis of data and basic statistics was performed using the SPSS 14 statistical program.

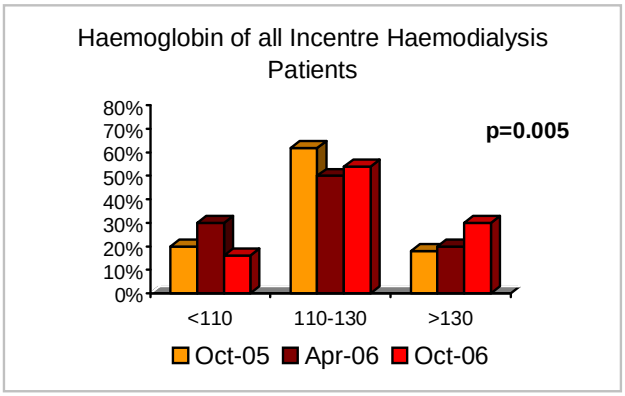
Outcomes & Recommendations:

<u>Haemoglobin</u>

- The CARI guidelines recommend the haemoglobin level in patients with significant cardiovascular disease should not exceed 120g/L unless clinical circumstances dictate otherwise. The CARI guidelines suggest an Hb concentration between 120-140g/L for patients without proven or likely cardiovascular disease. In the St George dialysis unit we have measured the patients Hb using the limits of 110-130g/L. For the haemoglobin audit, haemodialysis patients were divided according to the presence of cardiovascular disease.

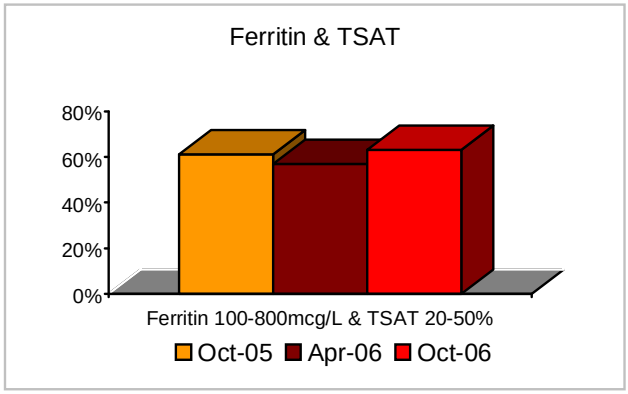






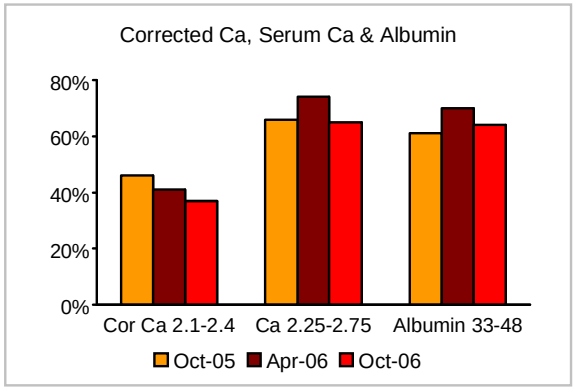
- A one way ANOVA on Oct 05, Apr 06 & Oct 06 resulted in a significant Hb p=0.001. Further analysis using an independent T Test between Oct 06 & Apr 06 resulted in 2-tailed Hb p=0.005.
- Changes to the iron protocol may have caused the 10% increase in Hb >130g/L. Hence greater emphasis and education was given to staff on reducing ERT dose once Hb >130g/L.

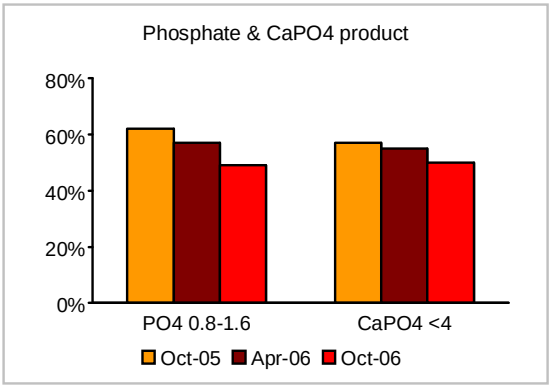
Iron Studies



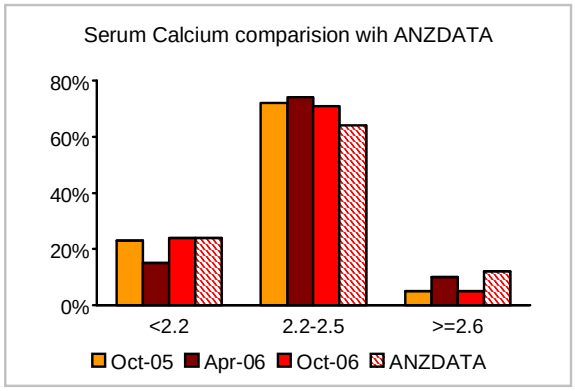
- CARI guidelines revised the iron guidelines in April 2006. The guidelines recommended to optimize epoetin dose aim for higher target values of iron storage than levels that define iron deficiency. The KDOQI 2006 also recommends ferritin >200mcg/L for haemodialysis patients. Hence the haemodialysis unit decided to alter the iron protocol to aim for ferritin 200-800mcg/L & TSAT 30-50%. Changes were introduced in June 2006.
- A Mann-Whitney test indicated p=<0.000 when Oct 06 ferritin levels were compared with Apr 06, Oct 05 & Feb 05.
- Oct 06 showed 14% of patients have a ferritin level >800mcg/L which is similar to previous audits. Most of these patients had recent hospital admissions for infections, MI or surgery.
- An Iron audit performed on the nurse initiated iron protocol in November 2006 indicated a greater use of IV iron since the TSAT range was increased from 20% to 30%. Fifty percent of patients in October 2006 had TSAT between 20-30%. As minimal improvement occurred to the overall iron studies the iron protocol was further revised.

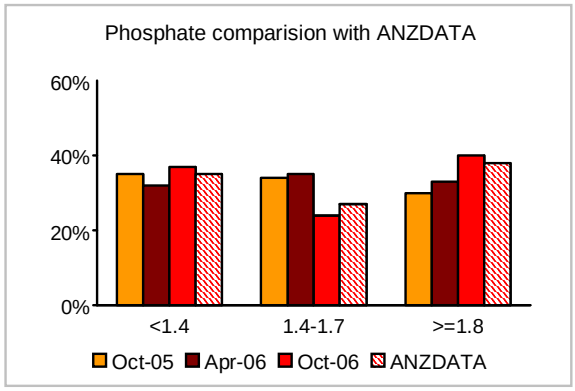
Calcium & Phosphate

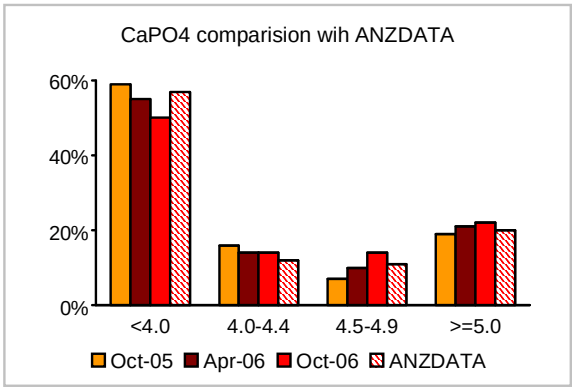




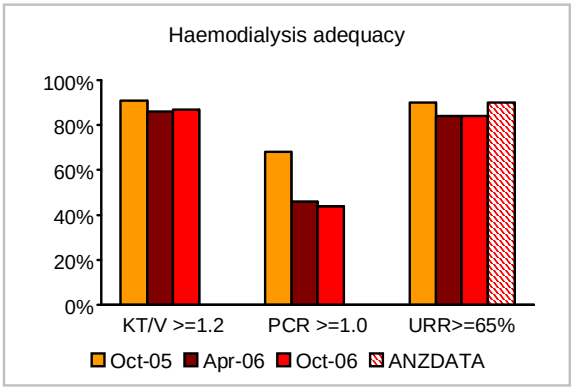
- CARI 2006 recommended tighter ranges in calcium and phosphate management to prevent morbidity and mortality.
- In July 2006 the nursing Calcium and Phosphate focus group developed and distributed to all nursing staff a learning package to improve staffs' knowledge and understanding of calcium and phosphate management.
- The Calcium and Phosphate focus group also developed a nurse initiated calcium and phosphate management plan, which will be distributed early 2007. Further formal education sessions will be implemented to facilitate staffs' learning.
- Overall serum calcium, phosphate and calcium phosphate product were similar to the ANZDATA 2006 report.







Adequacy



- CARI guidelines recommend the minimum achieved KT/V should be 1.2 and URR 65%. To consistently achieve this in at lest 80% of patients, it is recommended that the target KT/V should be 1.4 and URR 70%.

HAEMODIALYSIS WATER QUALITY

Background and Activity Levels

- The water quality is audited in the 4 West dialysis unit 2nd monthly for microorganisms, aluminium, chloramines and total chlorine.
- Full element analysis is conducted biannually.
- The Biomedical department is responsible for collecting the water specimens and follow up abnormal results.
- The audits are required to prevent infection amongst haemodialysis patients and maintain patient safety.
- Daily chloramine testing of central RO water is performed by nursing staff using a chlorine test kit.

Outcome being measured

Date	H2O (<200 CFU/mL)	Dialysate (<200 CFU/mL)
Jan 06	Normal range	Normal range
Mar 06	Normal range	Normal range
May 06	Normal range	Normal range
Jul 06	Normal range	Normal range
Sep 06	Normal range	Normal range
Nov 06	93	Normal range

Date	Elements Al 0.01mg/L, Chloramines 0.1mg/L, Total Cl 0.5mg/L
Jan 06	▪↑Ca, Mg, F, Cd in pre treatment areas
Mar 06	▪Normal
May 06	▪Normal
Jul 06	▪Normal
Sept 06	▪↑F pre treatment
Nov 06	▪Normal

- The audit ensures results comply with 2004 AAMI standards. Timely water testing and follow up occurred in 2006.
- AAMI guidelines indicate action is required when results are >50CFU/mL. Water samples in May, July, September and November resulted in >50CFU/mL. Repeated samples were obtained resulting in normal results except for November. As a consequence of the abnormal repeated result the RO was chemically disinfected.
- Retesting has added extra costs to the water management on 4west dialysis.
- Elevated elements occurred when testing was performed pre portable RO. The Biomedical department assures the elements are removed once an RO is connected.
- All other specimens were within the recommended AAMI range.

Recommendations

- Water sampling in pre treatment areas (ICU, CICU) to be tested using a portable RO to ensure appropriate element levels are removed.
- If abnormal results continue on specific portable RO, replacement of the membrane may be required.

VASCULAR ACCESS

Background and Activity level

- CARI and KDOQI guidelines advocate the preferred haemodialysis access is a native AV fistula.
- The Vascular Access Nurse assesses patients post access surgery, then follow up at one and six weeks post surgery to assess maturity of access.
- Data includes access used for new patients commencing their first haemodialysis in 2006.

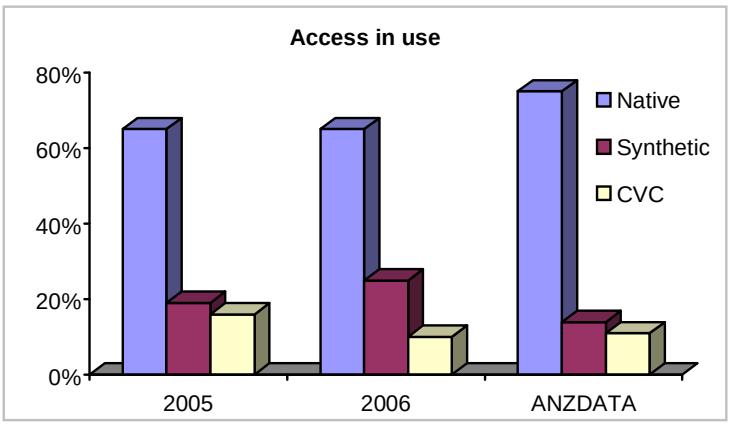
How did we Record, Store and Analyse the Data?

- Data was collected from operation reports at St George public and private hospitals and during follow up visits.
- Data is store in RISC database and the Access Excel database.
- Data is collected on access at first haemodialysis during 2006 and current patients access at 31st December 2006.

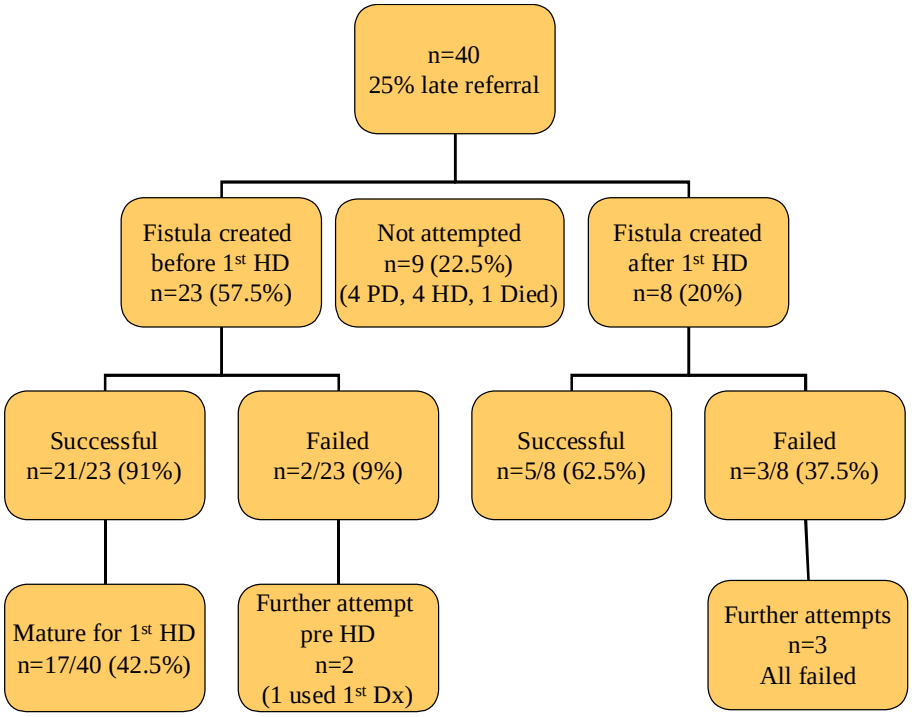
Data Benchmark

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

First Access Haemodialysis			
First Access	**St George 2005**	**St George 2006**	**ANZDATA**
Native	29%	32.5%	35%
Synthetic	4%	10%	3%
Tunnel CV	57%	47.5%	37%
Non Tunnel CV	11%	10%	25%



Fistulas in patients starting haemodialysis 2006



Comments

- The ANZDATA 2006 report indicates the overall use of native fistulas as an initial access is decreasing and CVC are increasing. An increasing trend of native or synthetic access is occurring at St George.
- Fifty six percent of patients commencing haemodialysis in 2006 had a vascular access attempted before their first dialysis session. An increase of 12.5% from 2005. Forty three percent of new patients had a mature functioning fistula for their first session. ANZDATA 2006 reports the use of vascular access (native and graft) for first dialysis at 38%.
- ANZDATA 2006 report has a higher incidence of non-tunneled CVC used for first dialysis (25%) compared to St George (10%). The incidence of tunneled CVC use remains higher at St George (47.5%) compared to ANZDATA 2006 report (37%) although the rate of tunneled CVC is lower than 2005.
- The National Kidney foundation Kidney Disease Outcomes Quality Initiative (KDOQI) 2006 evidence based practice guidelines recommends fistula use in 40% of prevalent patients. Sixty five percent of patients at St George have a native fistula.
- The KDOQI 2006 guidelines suggest <10% of chronic haemodialysis patients have a permanent catheter. Three percent of the St George population has a permanent access for dialysis.
- The appointment of the Vascular Access Nurse mid 2006 has resulted in a greater coordination of access management.

CENTRAL VENOUS CATHETERS

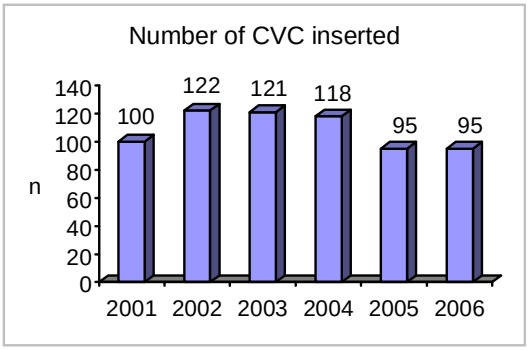
Background

- Central venous catheters (CVC) are required to provide temporary access for haemodialysis.
- Infection and complication rates of CVC are monitored and reported.

How did we Record, Store and Analyse the Data?

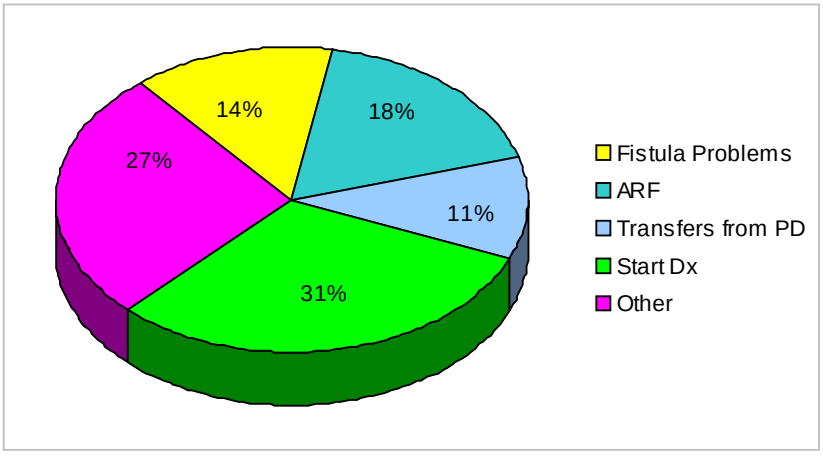
- Data is collected and entered into the access Excel database, which includes reason for insertion and removal, insertion site, type of catheter, number of catheters per patient and complications.
- Data is collected on catheters that are decontaminated according to protocol.

Activity Level



- The number of catheters inserted for haemodialysis has reduced from previous years. The type of catheters inserted in 2006 remains predominantly Bard tunneled cuffed internal jugular catheters 79%. Twenty one percent were temporary Arrow non–tunneled femoral or subclavian catheters.

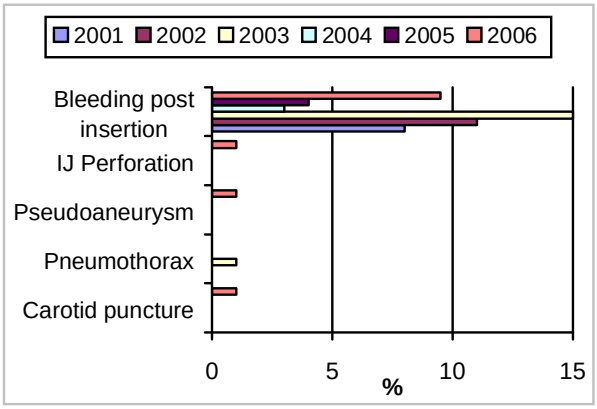
Reason for insertion of catheters in 2006



- In 2006 five percent less patients required a CVC inserted due to fistula related problems i.e. infection, blocked or immature. The number of patients transferring from PD and requiring a CVC was similar to 2005. Whilst an increase from 2005 occurred in patients requiring a CVC insertion with ARF and ESRD. Other includes replacing a non-tunneled catheter with a tunneled,

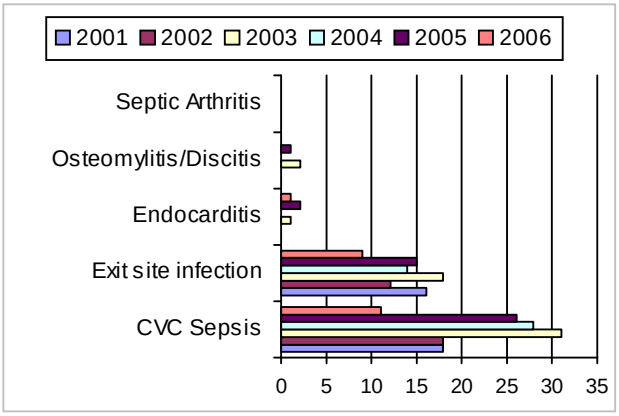
malfunction of the catheter and replacing an infected or faulty catheter which was lower than 2005.

Complications related to insertion



- Bleeding post insertion occurred mainly with ARF and uraemic ESRD patients. All complications resolved without further harm to the patients.

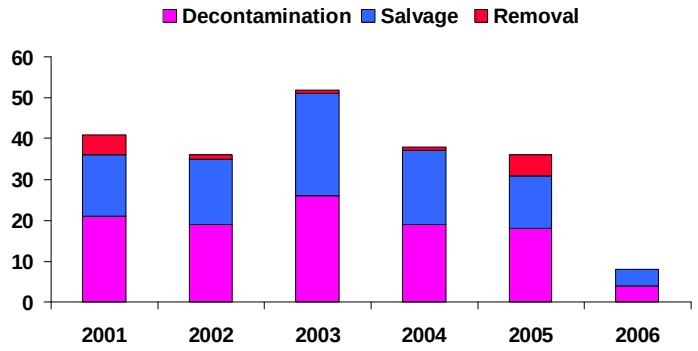
Catheter infection rates



- In 2006 a prophylactic gentamicin and heparin lock was instilled in every catheter to reduce infection rates. The antibiotic lock was instilled after each catheter access from time of insertion. Resulting in a catheter related bacteremia rate of 12% (1.4/1000 catheter days) in 2006 compared to 27% (3.2/1000 catheter days) in 2005. Additionally the rate of exit site infections also reduced from 16% (1.8/1000 catheter days) in 2005 to 9% (1.1/1000 catheter days) in 2006.

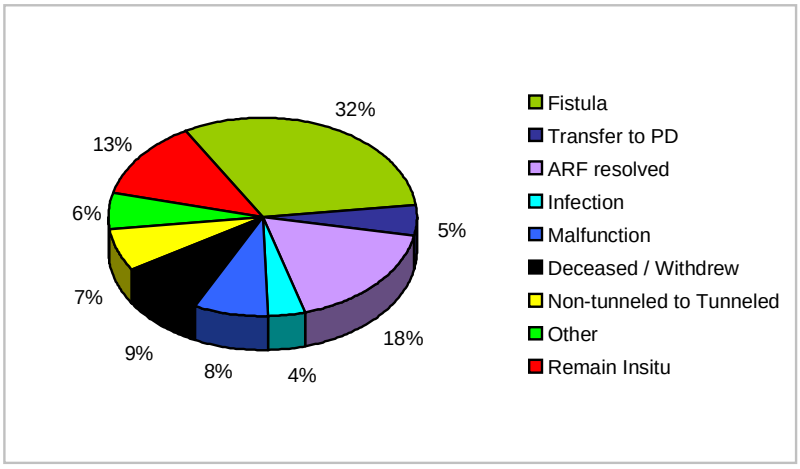
- A randomized controlled trial proposal was developed and offered to Johnson and Johnson for financial assistance in supplying a chlorhexidine gluconate impregnated dressing (Biopatch) to reduce the incidence of exit site infections. No further correspondence was received and another avenue to reduce infection rates such as the use of Medihoney was investigated. The hospital drug committee granted a submitted proposal to use Medihoney as a will be implemented in 2007.

Decontamination for suspected CVC sepsis



- The rate of decontamination of tunneled catheters reduced due to improvements in infection rates. Hence, less hospital admission for infections also occurred in 2006.
- Four catheters were decontaminated in 2006 with a 100% salvage rate.
- Decontamination was required on average 83days (range 23-183days) post catheter insertion.
- Decontamination was not attempted on 6 non-tunneled infected catheters and were subsequently removed.

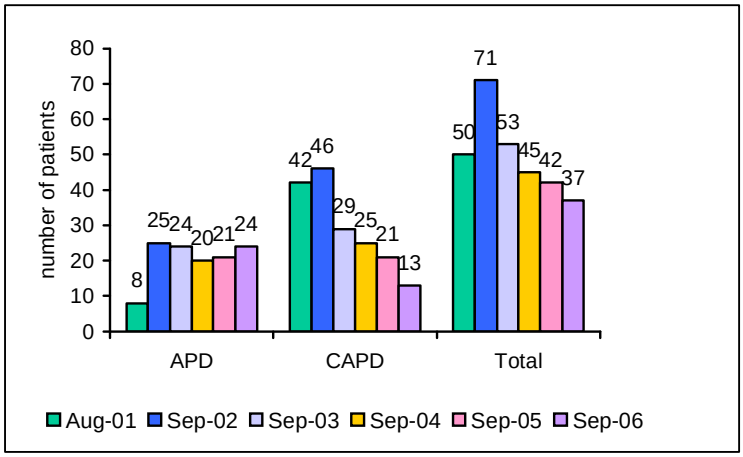
Reason for catheter removal

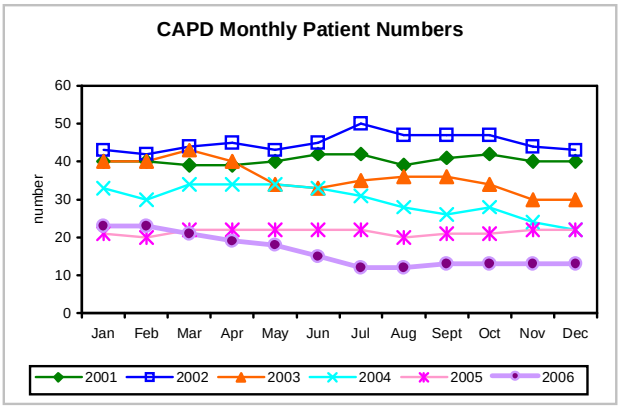


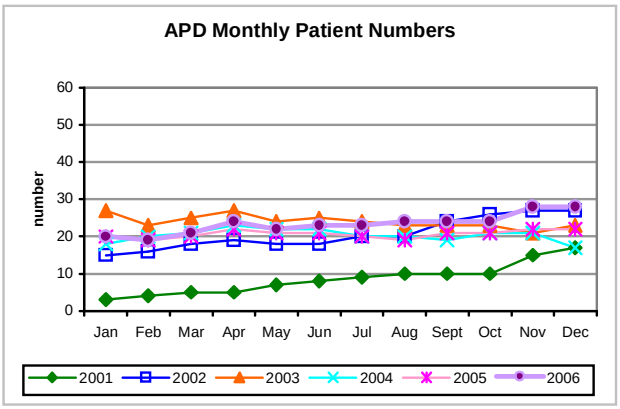
- The main reason for removal of CVC remains fistula maturation.

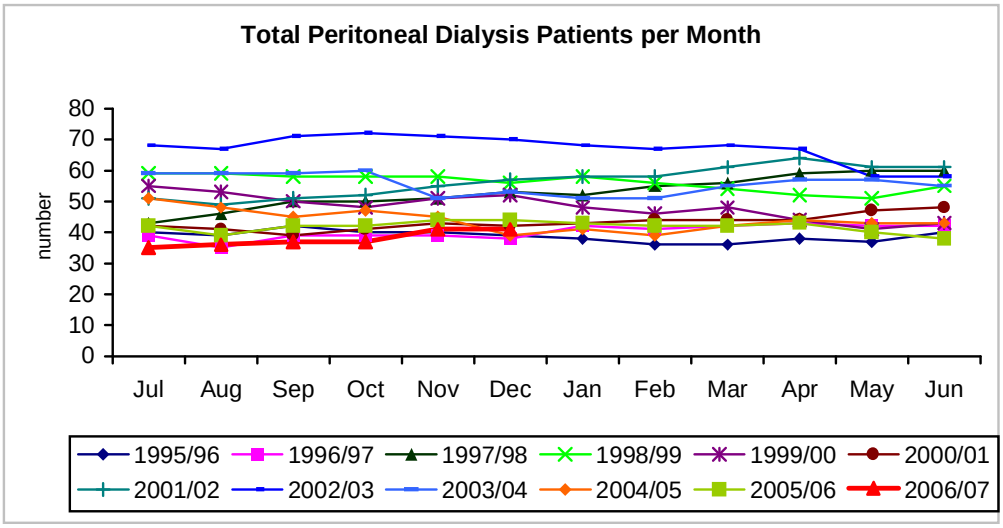
PERITONEAL DIALYSIS

The peritoneal dialysis unit has seen a steady decrease in total patient numbers in the past 3 years with a total of 65 patients being treated in 2006 compared to 67 in 2005 and 74 in 2004. In December 2006 the prevalence of *automated peritoneal dialysis (APD)* was 68% and *continuous ambulatory peritoneal dialysis (CAPD)* 32%.









Comparison with:

The ANZDATA 29th Annual Report 2006 (data to 2005)

- ANZDATA results show a small increase in the prevalence of people using automated peritoneal dialysis (APD), up 3% Australia wide. St George peritoneal dialysis unit continues to increase the numbers of patients on automated peritoneal dialysis by a significant proportion, in December 2006 the APD population had increased by 18%, which is far greater than the total Australian growth reported by ANZDATA. The St George CAPD population continues to decline; down by 18% from December 2005.

APD	*ANZDATA 43% (784/1811)*	*St George 68%*
CAPD	*ANZDATA 57% (1027/1811)*	*St George 32%*

Patient Flow – Peritoneal Dialysis

Balance carried forward: Peritoneal dialysis patients as at 01.01.2006 (n=44)

In	New Patients	14	
	New patient transfer from Hd	4	
	Failed transplant – new to PD	1	
	Returns from HD	3	
	Transfers from other units	0	
	Subtotal		22
Out	Transplants	2	
	Transfer to other units	1	
	Transfer to Home Haemodialysis	1	
	Temporary Transfers to Haemodialysis	2	
	Permanent Transfers to Haemodialysis	13	
	Withdrawal from dialysis	3	
	Return of renal function	1	
	Deaths on CAPD	2	
	Subtotal		25
	Net Loss	**3**	
	PD patients at end of 2006 =		**41**

This table indicates the following activity rates using the ANZDATA 29th annual report for comparison

	St George 2006 (%)	ANZDATA 2006 (%)
Transplants	5	7
Change to haemodialysis permanent	34	23
Change to haemodialysis temporary	5	5
Deaths on Dialysis (PD)	5	12
Death due to withdrawal*	2	3

Note: The rates are calculated using the total number of patients on peritoneal dialysis at 31.12.2006 (n=41), the same method as ANZDATA. *Death due to withdrawal is calculated using only 2 patients as one withdrew, moved home and was lost to follow-up.

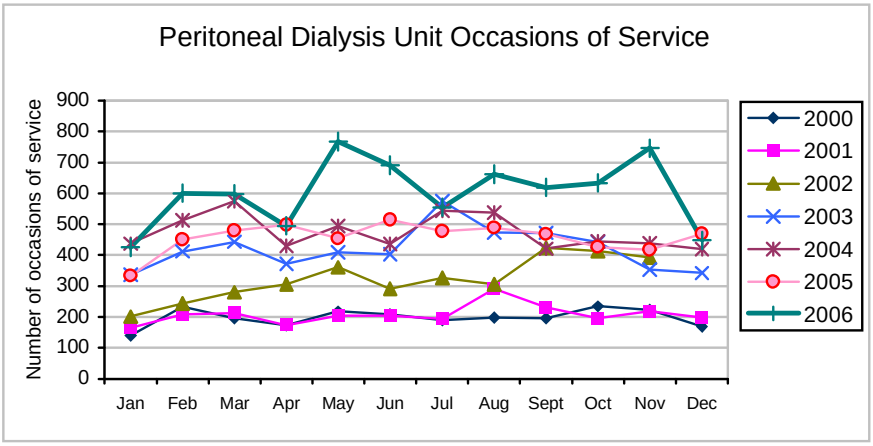
Patients changed to haemodialysis for a variety of reasons:

- Surgery (n=1)
- Infection (major cause) (n=10)
- Inadequate dialysis (n=1)
- Dialysate leak (n=2)
- Acopia (n=1)
- Personal choice (n=1)
- Two patients had insertion of Tenckhoff catheters but did not proceed to peritoneal dialysis due to complications.

The percentage of deaths on peritoneal dialysis is considerably lower than the ANZDATA Australian rate, and the withdrawal rate is similar.
The percentage of permanent transfers to haemodialysis is higher than ANZDATA, but the temporary transfer percentage is the same. This reflects the number of patients who had peritonitis and did not return from haemodialysis once transferred.

Workload

In 2006 the PD unit provided 159 training days (20 more than 2005) for PD patients with training time varying from 5-21 days. There were 7242 occasions of service (1765 more than 2005), which includes nurse outpatients, doctor outpatients, home visits, patient/staff education and phone contact. This is outlined in the following chart:



The CAPD clinic provides services to inpatient and outpatient peritoneal dialysis patients; dialysis and transplantation clinics, post operative Tenckhoff insertion inpatient follow-up, home visits, phone contact and dialysis training in conjunction with ongoing patient education.

There were 63 hospital admissions in 2006 for peritoneal dialysis patients, 24 are related to peritonitis, 45 related to peritoneal dialysis catheter insertion or removal, 12 related to patients requiring hospital IPD (intermittent peritoneal dialysis) for fluid overload or post op, and 2 kidney transplants.

PD Dialysis Adequacy, Biochemical and Haematology targets

Aim

To compare dialysis adequacy using haematological biochemical markers and Kt/V with previous audits conducted in April '05 (41 patients), October '05 (45 patients), April '06 (40 patients) and October '06 (37 patients). 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.

To ensure all patients have had a PET test performed to establish a baseline membrane transporter status.

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 during October - December 2006 for the current dialyzing PD patients and compared to previous audits. Dates for the collections were moved forward by one month in 2005 to coincide with the new yearly ANZDATA collection date.

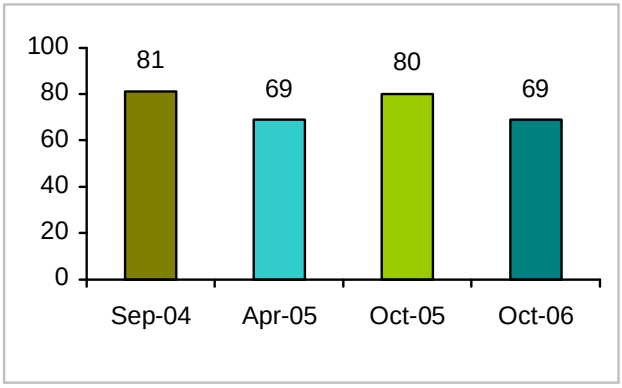
Method

The CAPD clinic nurses and consultant renal physicians arrange the collection LFT, UEC, FBC, Iron studies, PTH, Mg, Ca, PO4 and Lipids as per routine 6 monthly bloods for PD patients.

Kt/V testing was coordinated by the CAPD nurses as per protocol as was the PET testing.

The quality assurance nurse collates these results into spreadsheets using Microsoft Excel and SPSS v14 for statistical analysis. These results are compared to the previous year and measured against the benchmark set by the CARI guidelines. If any action is required, a meeting is organised with the peritoneal dialysis unit and actions are taken to resolve issues. A unit member will then be nominated to take responsibility for the action while the quality assurance nurse will follow up and report the results in 6 monthly intervals.

Percentage of patients who achieved a Kt/V ≥ 1.7

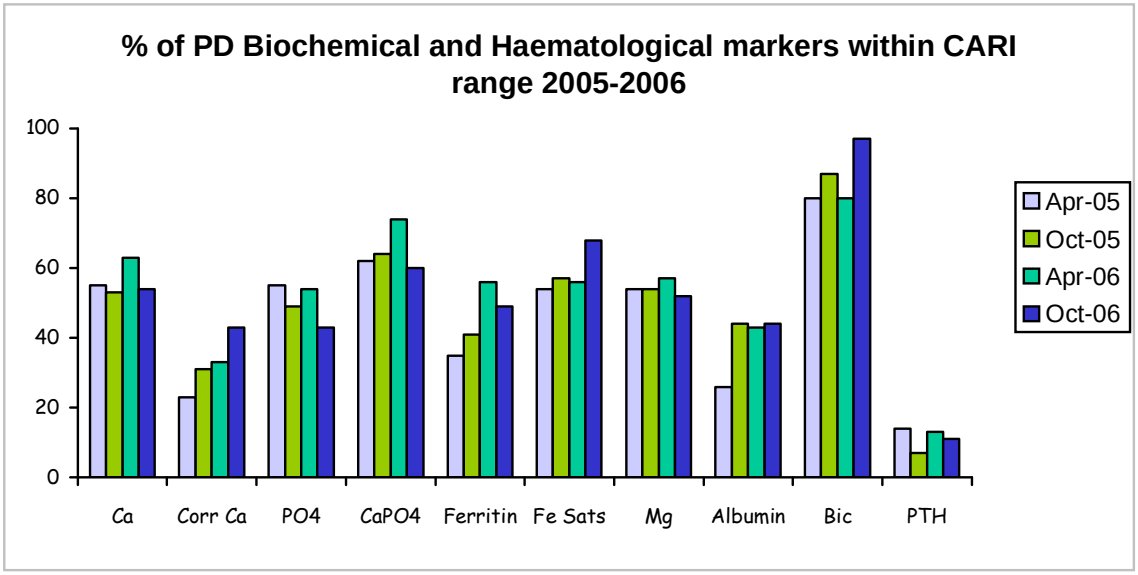


Statistics:

KT/V Oct 05 / Oct 06:

Non-Parametric independent Mann-Whitney test: no significant difference found between 2005 and 2006 (p>0.05)

Oct 06 Median and Interquartiles: 2.01 (1.91,2.34)



Results: % of patients falling within the target range

Parameter	Target	Apr 05	Oct 05	Apr 06	Oct 06
Ca	2.25-2.75 mmol/L	55	53	63	54
Corr Ca	*2.1-2.4 mol/L	23	31	33	43
PO4	*0.8-1.6 mmol/L	55	49	54	43
CaPO4	*<4.0 mmol/L	62	64	74	60
Ferritin	*200-800 ug/L	35	41	56	49
Fe Sats	20-50%	54	57	56	68
Mg	0.74-1.03 mmol/L	54	54	57	52
Albumin	33-48 g/L	26	44	43	44
Bic	20-30 mmol/L	80	87	80	97
PTH	10-15 nmol/L	14	7	13	11
KT/V	≥ 1.7	69	80	-	69
CCL	> 50L	59	67.5	-	77

* These parameters have changed since 2005 following the new CARI guidelines

Comments

In October 2006, 11% (n=4/35) of peritoneal dialysis patients had a PTH within the recommended limits set by CARI of 10-15nmol/L (April 2006 equalled 13%). 26% (n=9/35) had a level less than 10 while 63% (n=22/35) had a level greater than 15 with the maximum recorded at 124 and the sample mean was 32.76 nmol/L. These are improvements from the results seen in 2005 with a greater overall percentage of patients with a PTH within the normal limits. An independent non-parametric Kruskal-Wallis test showed no significant difference in PTH $(\chi^2 = .145, df = 3, p > 0.05)$ between 2005 and 2006.

Statistical analysis showed no significant difference between 2005 and 2006 biochemical results in calcium, corrected calcium phosphate calcium phosphate product, ferritin, iron saturation, magnesium or albumin. Bicarbonate shows significant differences between the four collections using ANOVA (F=3.025, df=3, p<0.05).

Iron

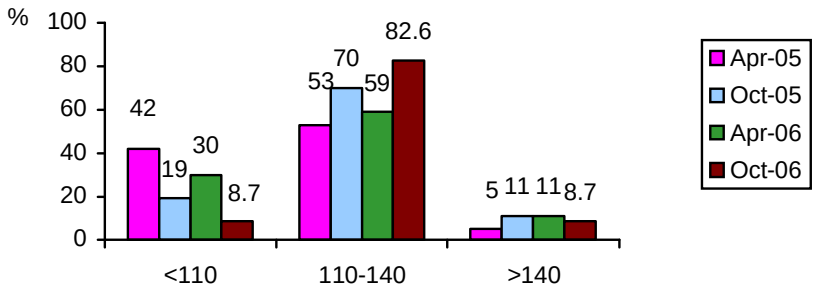
The CARI guidelines recommend the administration of supplementary Iron to prevent iron deficiency and to maintain an Hb concentration >120 g/L, with or without epoetin therapy. Bolus administration of IV iron (Ferrosig 500mg) is easy to administer and is the treatment of choice in the St George renal unit. The Ambulatory Care unit administers this by appointment after the patients have been prescribed the drug by the renal registrar or consultant.

A more formalized process of referring patients for Iron infusions was introduced with modest results. Iron saturations have improved, but little improvement has been seen in Ferritin levels. An initial improvement in April Ferritins levels wasn't sustained and levels again fell outside the normal limits; no statistical significance was found. More work is going to have to occur in this area to bring Iron levels up within the peritoneal dialysis unit. The aim of this system is to reduce the number of patients within the peritoneal dialysis unit who have sub-optimal Ferritins and Iron saturations.

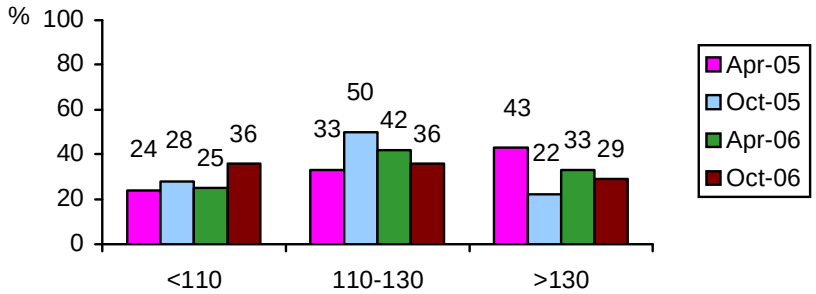
Haemoglobin

Haemoglobin (Hb) has been examined using cardiovascular disease as a determining factor. The recommendations from the CARI guidelines suggest that patients with kidney disease *and cardiovascular impairment* maintain an Hb 110-130 g/L (Level 1 evidence). CARI suggests an Hb concentration between 120-140 g/L for patients *without proven or likely cardiovascular disease.* There has been an improvement in haemoglobins between April and October 2006, but the difference was not significant (p>.05) using an independent t-test.

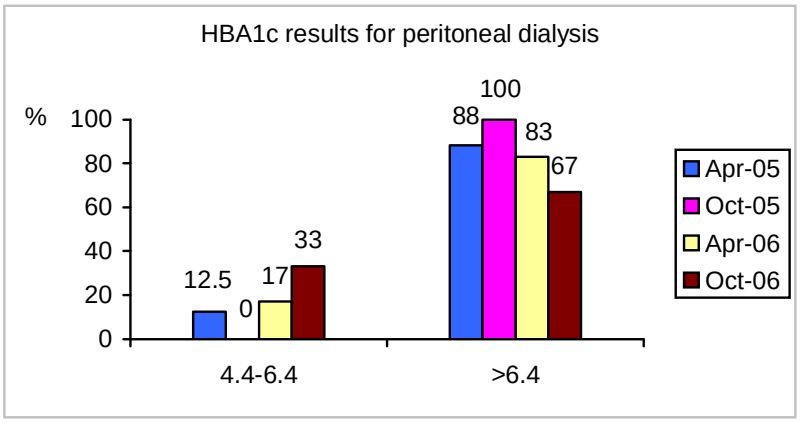
Haemoglobin results for patients with no known cardiovascular disease



Haemoglobin results for patients with known or suspected cardiovascular disease

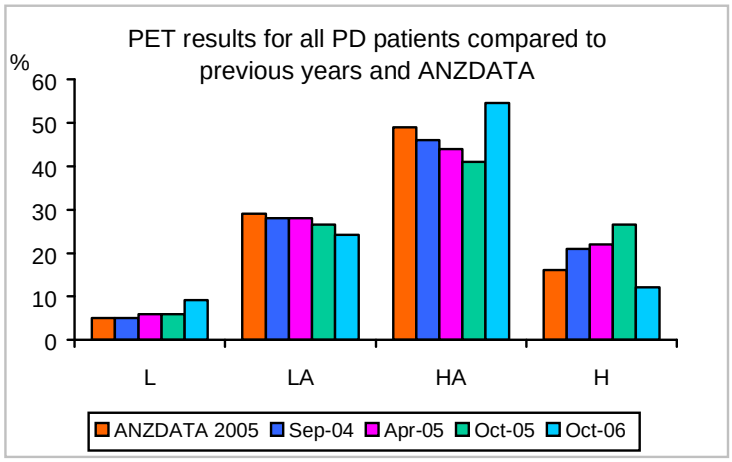


HbA1c (Glycosylated Haemoglobin)
Measuring the HbA1c gives an average glucose level of the past 8-12 weeks. There has been an improvement in the percentage of patients within a normal range of 4.4-6.4 suggesting better sugar control.



PET (Peritoneal Equilibrium Test) Results

A PET is performed approximately 1 month after initiating peritoneal dialysis but no earlier than 2 weeks.
The St George Hospital peritoneal dialysis unit only performs 1 PET on each peritoneal dialysis patient but further tests are undertaken if a change in transport status is suspected. CARI recommends an annual PET if there is clinical evidence of a change in transport status (eg clinically significant decrease in ultrafiltration or unexplained fluid overload).



In 2006, 33/41 patients have had a PET established to identify the peritoneal membrane transport characteristic. Those who have not had a PET completed are new patients and those who have had interrupted dialysis due to admission with hospital IPD and peritonitis.

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.

Background

Data on peritoneal infections were collected using the Poet 2.1 database and a review of the PD record books. These statistics are collected retrospectively on a yearly basis and compared to the previous year.

Method

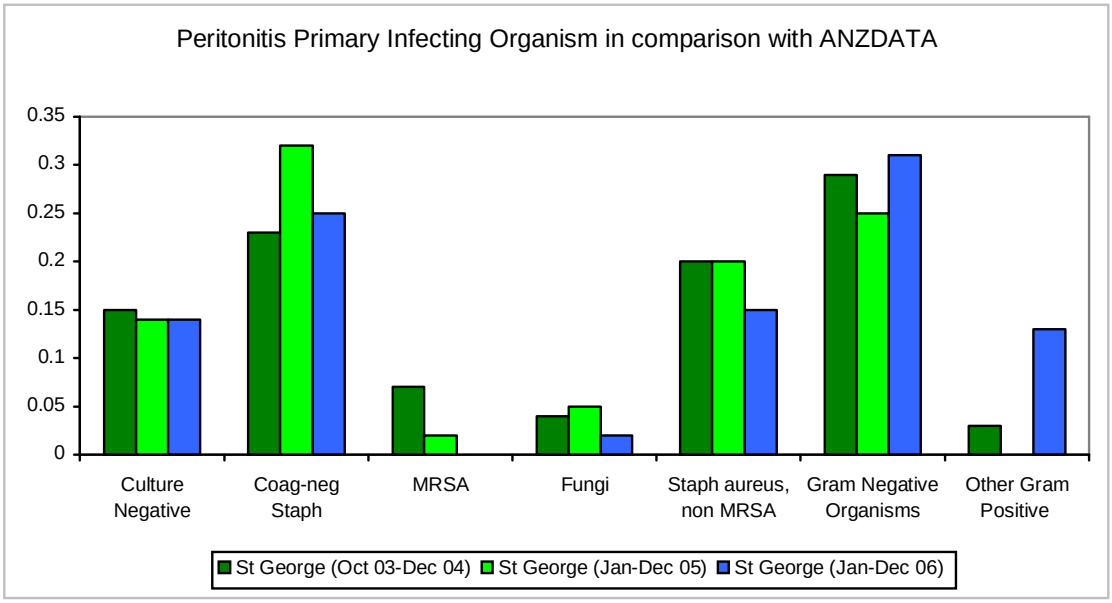
Review PD record books for episodes of peritonitis and exit site infections.
Review the Poet 2.1 database for episodes.
Peritonitis Episode Forms (ANZDATA) are used to accurately enter data into an excel spreadsheet. This data is then analyzed using the statistical program SPSS vs14. The Peritonitis Episode Form lists the organism(s), Drug Treatments, Outcomes and Recurrence of every episode of peritonitis for every peritoneal dialysis patient while on PD. The forms are sent to ANZDATA where feedback can be obtained by request to compare the data from our unit to that of different states. Privacy rules prevent direct comparison between hospitals.

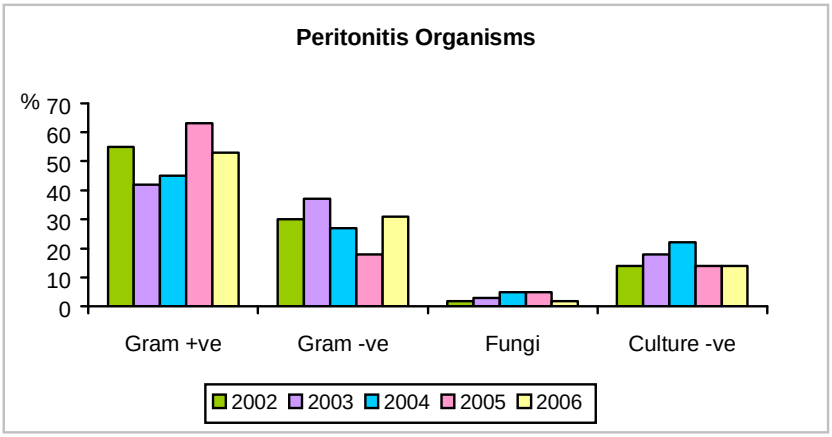
Outcomes

The table below outlines the data on peritoneal dialysis infection rates collected from 1998 to 2006.

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total patients	72	71	62	79	97	92	74	67	65
Peritonitis episodes	118	81	69	45	51	62	42	34	40
Patients with at least 1 episode of peritonitis	N=47	N=42	N=26	N=26	N=37	N=38	N=32	N=31	N=28
	65%	59%	42%	33%	38%	41%	43%	46%	40%
Patients with at least 1 episode of Exit site infection	N=39	N=43	N=33	N=21	N=32	N=38	N=14	N=16	N=14
	54%	60%	53%	27%	33%	41%	19%	24%	18.5%

Peritonitis Causative Organisms





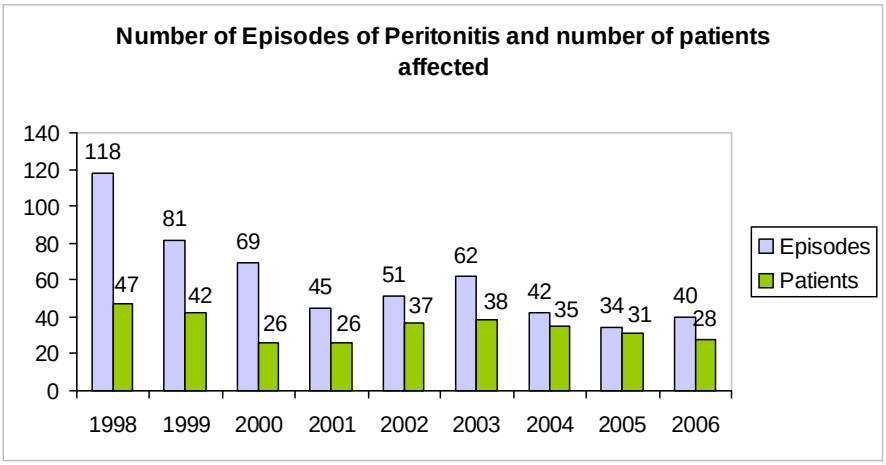
Recurrent infections and infections that occurred while not on peritoneal dialysis are not included. Recurrent peritonitis is defined as 'within four weeks of the last antibiotic dose (or within five weeks if intermittent Vancomycin used) for the same organism' ANZDATA (2006).

Change of treatment as a result of peritonitis

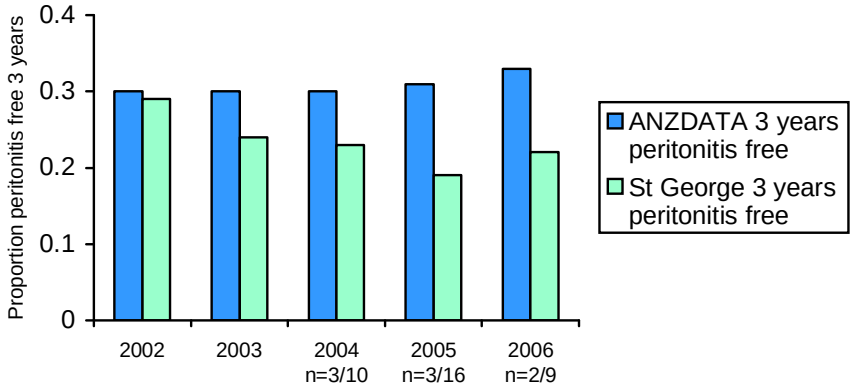
The peritonitis data collected throughout 2006 was run through the SPSS 14 statistical program to determine the rate of transfer to haemodialysis as a direct result of peritonitis. The results are listed in the following table:

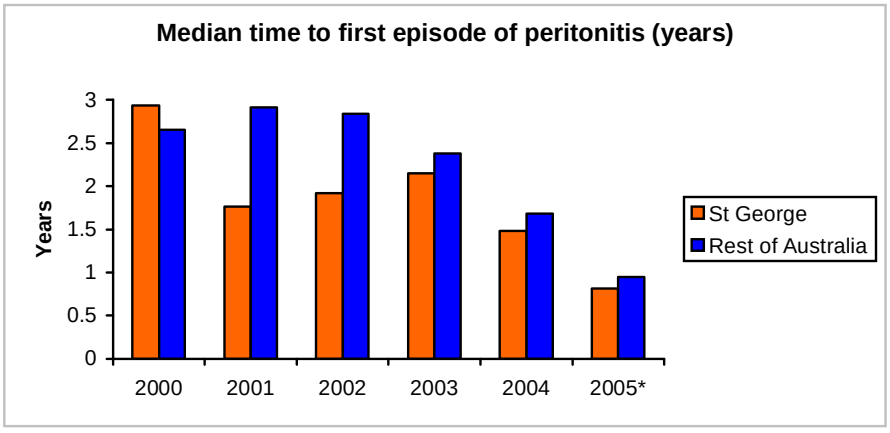
Change in treatment (%)	2005	2006
Interim Haemodialysis	9	9
Permanent Haemodialysis	11	13
Catheter removed	20	22

Peritonitis graphs and tables comparing previous years and ANZDATA



Proportion of peritoneal dialysis patients who have dialyzed greater than 3 years and are still peritonitis free.





***Note**: 2005 may not be representative of the true value due to the short follow-up time (not enough time for patients to develop an episode of peritonitis)*

First PD treatment to First Episode of Peritonitis 2000-2005 (Data supplied curtesy of Stephen McDonald from ANZDATA)

Peritonitis free survival time	Rest of Australia	St George
1 year	82% ± .62 (2708)	71% ± 3.9 (82)
2 year	58% ± .91 (1320)	45% ± 4.9 (36)

% Survival ±SE and (Numbers at risk)

Peritonitis incidence rates are a direct year-to-year comparison with ANZDATA, therefore the results for 2006 will not be available until late 2007. Data provided courtesy of Stephen McDonald from ANZDATA.

Comments

ANZDATA results are the benchmark used for comparison with St George results; ANZDATA covers all age ranges, whereas the St George population is mainly elderly.

The peritonitis incidence per patient months has declined in 2006 from 1/15.1 months to 1/12.1 months; this means that there is less time between incidents of peritonitis. Median time to first episode of peritonitis has shown a steady improvement between 2001 and 2004, time to first episode is catching up to the rest of Australia. 2005 cannot be interpreted as representative at this stage as more time is required.

The percentage of patient's peritonitis free at 3 years has improved to 22% after the previous years fall to 19%. Over the period of 2000 to 2005, 71% are peritonitis free at 1 year and 45% at 2 years compared to the rest of Australia, which is 82% and 58% respectively.

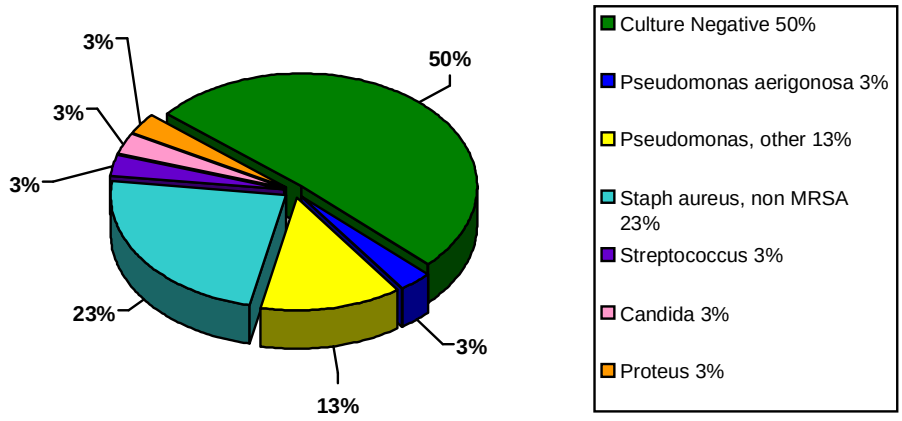
Five patients had more than one organism isolated from the dialysate with two patients having 3 organisms isolated and three having 2 organisms isolated. Of these five patients, three transferred permanently to haemodialysis.

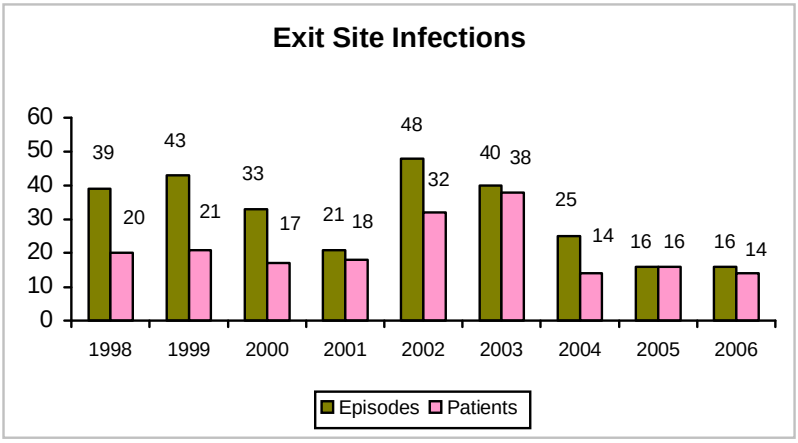
ANZDATA (2006, p.100) reports the primary cause of technique failure (ceasing peritoneal dialysis) as social reasons 34% and infections are the second most common cause 29%. St George primary reason for technique failure is 77% peritonitis, followed by a mixture of inadequate ultrafiltration, social and surgical causes. The small percentage of failure due to social reasons (15%) reflects positively on the processes involved in acceptance onto peritoneal dialysis.

St George peritoneal dialysis unit is striving for a reduction in the peritonitis and exit site infections rates of its population on an ongoing basis. The population consists of patients who are generally self-caring and performing treatments as part of their normal activities of daily living. This accounts for the variation in organisms isolated from peritoneal dialysis fluids. The patient's environment at home may play a role in the rate and type of infections encountered. Where patients are performing dialysis in a less than adequate environment, steps are taken to educate and reinforce good technique and educate regarding the basic principles of dialysis and equipment care; it is ultimately the patients responsibility once discharged home from training to follow the taught principles of aseptic technique and exit site care without taking short cuts and to contact the unit when having difficulties. Ongoing education is a priority, and key ingredient, in the peritoneal dialysis unit for decreasing the rates of peritonitis and exit site infection.

Exit Site Infections

Exit Site Swab results, January 2006 to December 2006.





- ESI episode in 2006 is 1/30.2 patient months compared to 1/32 patient months in 2005.
- 81.5% of the total number of peritoneal dialysis patients, were free from exit site infections in 2006 compared to 76% in 2005.

Benchmark: ANZDATA

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

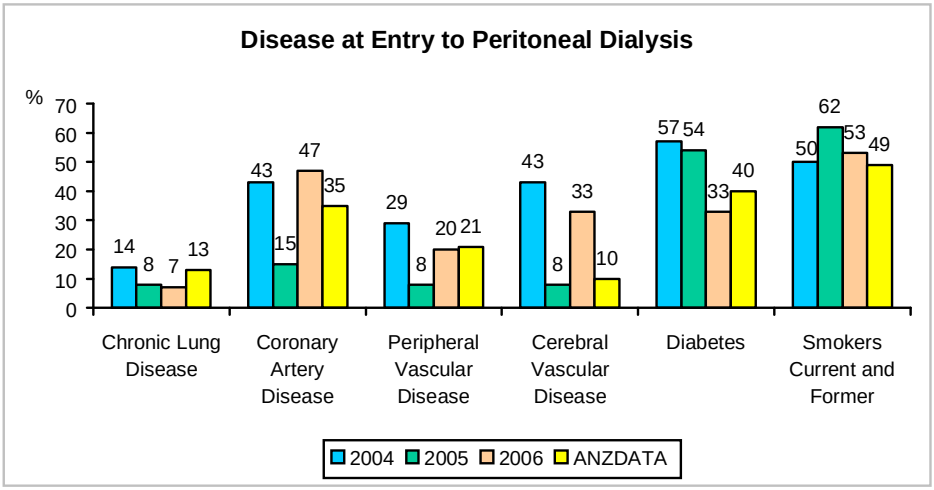
POET

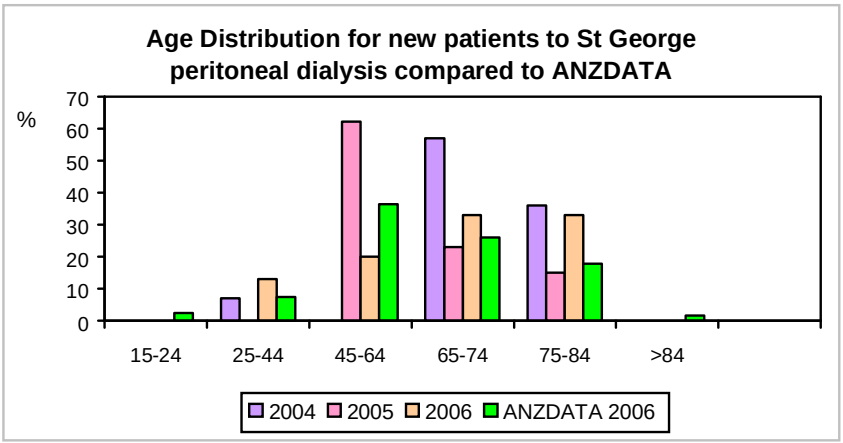
The St George Peritoneal Dialysis Unit uses the Baxter POET computer software to record all swabs taken for analysis from each and every PD patient. The results of all of these swabs can then be graphed using this software. The drawback of this system is the inability to filter this data for actual exit site infections and routine swabs (including post operative). The filtering of the data has to happen manually using excel spreadsheets and SPSS v14 for analysis.

Acceptance onto Peritoneal Dialysis

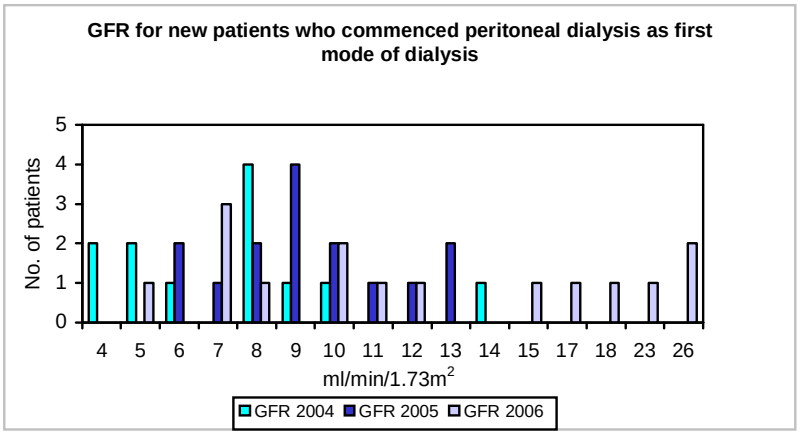
15 patients are included in this data. Excluded are the patients who are included in haemodialysis data.

- 2006 had one late referral to peritoneal dialysis.
- Mean age at commencement of PD was 65 years.





Compared to the previous years, in 2006 we accepted a fairly even distribution of patients from most age groups; this corresponds to ANZDATA. There has been an increase in the 25-44 and 65-84 year age groups and a decrease in the 45-64 year age group.



In 2006 there were a greater number of patients who commenced dialysis with a higher GFR, the highest being 26 ml/min/1.73m^2.
The calculations are prepared using available patient details at commencement of dialysis. The data used for this calculation is height, weight, age, sex and creatinine. This data is then calculated using a GFR calculator.

Breakdown of baseline Characteristics of new peritoneal dialysis patients

		St George Total 2006 (n=15*)	ANZDATA 2006
Gender	Male	67%	53%
	Female	33%	47%
Co-morbidities	Smoking (Current and former)	53%	49%
	Chronic Lung Disease (yes and suspected)	7%	13%
	Cerebrovascular Disease	33%	10%
	Coronary Artery Disease	47%	35%
	Peripheral Vascular Disease	20%	21%
	Diabetes	33%	40%

*Excludes patients who had other renal replacement therapy prior to peritoneal dialysis

St George Hospital new patients*		2006
Body Mass Index	<20	0%
(kg/m)	20-24.9	33%
	25-30	47%
	>30	7%
Racial Origin	Caucasoid	93%
	Aboriginal/TSI	0%
	Maori/Pac Islander	7%

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, 26-30 overweight and >30 is obese.

Changes to the distribution of peritoneal dialysis patients amongst the nephrologists can be seen in the table below.

Doctors	2005	2006
Brown	20.5%	20%
Chan	23%	27%
Kelly	11%	27%
Mangos	16%	27%
Trew	29.5%	0%

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 population. Four audits conducted by our unit in 2001, 2003, 2004 and 2006 also showed similar results.

In 2006, all dialysis patients associated with our dialysis unit were given a Short Form 36 (SF-36) questionnaire to complete. The aim was to again assess QoL in our dialysis patients.

SF 36 Questionnaire

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

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

- The SF-36 is a universal tool for the measurement of health status. Data exist for population groups (including normal Australians) allowing for age and gender matched comparisons.
- Questionnaires were scored using the COES software (clinical outcomes evaluation system), yielding scores in each dimension between 0-100 with higher scores indicating better health status. In addition a composite physical and a composite mental score were generated.

Activity

- Home HD and Peritoneal Dialysis patients were sent a SF 36 questionnaire via the mail with a reply paid envelope attached. In-centre HD patients were handed their questionnaires in person. A total of 211 questionnaires were distributed (hospital haemodialysis: n=63, home haemodialysis: n=24, peritoneal dialysis: n=31)
- Patients excluded from the survey were non-English speaking or suffering from dementia or a psychological condition.
- The return rate was 60%, this is the same as the 2004 survey.

How did we record, store & analyse the data

- All returned surveys were entered into the COES program and SPSS 14 for statistical 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 using SPSS 14.
- Regression analysis determined if there was any significant relationship between SF-36 scores and Haemoglobin, albumin, Kt/V and age.

Benchmark Data

Data was compared to the results of the previous three surveys.
Data was also compared to the Australian normative data (Bureau of Statistics).

Outcome

Patient characteristics:

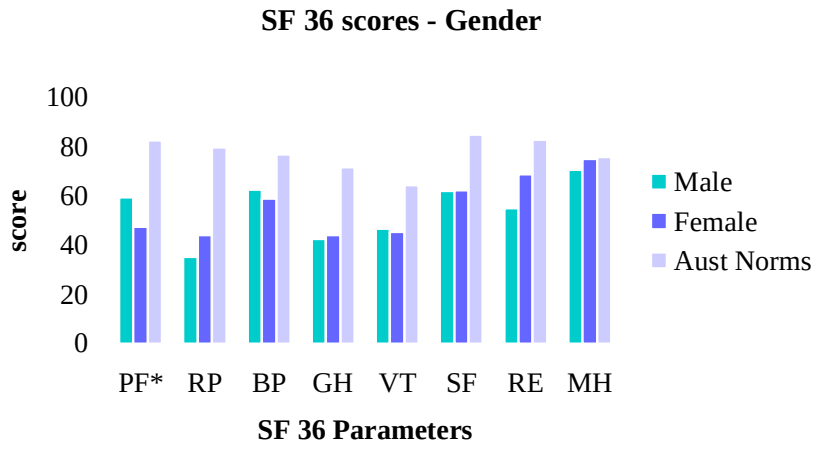
	2004	**2006**
Age	62.74 ± 13.90	62.9 ± 13.45
Male	61%	61.2%
Diabetes	32%	26%
Haemoglobin	120.6 ± 16.02	118.7 ± 18.69
Albumin	32.36 ± 5.26	33 ± 4.5
Kt/V CAPD	2.03 ± 0.54	2.1 ± 0.45
Kt/V HD	1.75 ± 0.43	1.63 ± 0.39

The following table shows the comparison of our findings compared to the Australian normative data.

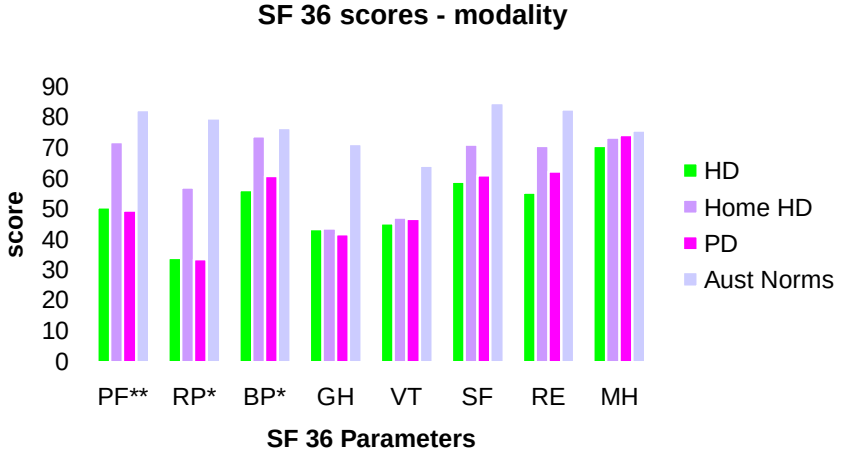
Parameter	**2004**	**2006**	**Aust Norms**
Physical Functioning	**52.65** ± 30.65	**54.78** ± 29.72	**82.1 - 83**
Role/Physical	**39.12** ± 42.17	**38.45** ± 42.78	**79.1 - 80.5**
Bodily Pain	**63.63** ± 28.79	**60.84** ± 27.91	**76.3 -77.3**
General Health	**45.25** ± 24.48	**43.22** ± 24.17	**71.2 - 72**
Vitality	**53.33** ± 2.89	**46.17** ± 23.50	**61.1 - 64.9**
Social Functioning	**45.67** ± 18.88	**62.00** ± 30.14	**84.5 - 85.4**
Role/Emotional	**44.33** ± 50.95	**60.23** ± 43.27	**82.2 - 83.5**
Mental Health	**76.00** ± 24.00	**72.09** ± 18.80	**75.6 -76.3**

The dialysis patients in the St George renal unit in 2004 and 2006 continue to have a poorer self assessed QoL than the average Australian in seven of the eight measured parameters. The mental health QoL parameter is equal to the Australian mean.

Results



Gender has revealed a difference in the scores for physical functioning between males and females (p=.053), this is marginally significant.



The SF36 scores show a significant difference between the modalities of home haemodialysis and hospital haemodialysis in the parameters of role physical (RP) and bodily pain (BP) ($p<0.05$), and physical functioning (PF) ($p<0.01$); and between the modalities of home haemodialysis and peritoneal dialysis in the parameters of physical functioning and role physical ($p<0.05$). This is consistent with the 2004 results showing home haemodialysis offers a better physical QoL compared to hospital haemodialysis.

There was a significant difference found in ages between home and hospital haemodialysis (N=89), $(Z = -3.58, p < 0.001)$, age stratification was carried out to reduce bias. A two sample non-parametric test (Mann-Whitney U) shows the difference between home and hospital haemodialysis in the parameters of PF and RP remain significant ($p<0.05$) within the age group of 45-64 years (N=37).

There are also significant differences in physical functioning and social functioning scores ($p<0.05$) between diabetics and non-diabetics.

Actions

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 in-house programme at present, but exercise is recommended and encouraged.

The results of the SF-36 survey has shown a difference in the self reported QoL of patients between the modalities of dialysis with home haemodialysis showing a significant difference in physical quality of life scores compared to peritoneal dialysis and hospital haemodialysis. This has implications for the renal unit with regards to promoting the home haemodialysis option to eligible clients especially between the ages of 45-64.

The following table represents results between modalities not stratified for age.

Parameters 2006	Hospital (n=65)[a]	Home (n=24)	Peritoneal dialysis (n=32)[b]	Test Statistic[#] χ^2	df	p-value
PF	50.77 (30.79)	72.00 (22.36)	49.00 (28.75)	10.656	2	<.05
RP	34.13 (40.98)	57.29 (42.01)	33.87 (44.51)	5.944	2	.051
BP	56.30 (28.24)	74.00 (22.27)	61.00 (28.67)	7.291	2	<.05
GH	43.58 (23.46)	43.75 (26.08)	42.00 (25.19)	.183	2	.913
VT	45.42 (21.26)	47.29 (25.19)	46.97 (27.18)	F=.075	2	.927
SF	59.22 (28.74)	71.38 (31.61)	61.28 (31.51)	3.165	2	.205
RE	55.54 (44.43)	70.88 (43.19)	62.39 (41.08)	2.098	2	.350
MH	70.89 (19.29)	73.50 (19.41)	74.38 (17.06)	.728	2	.695
Age	64.42 (12.53)	52.76 (12.88)	67.43 (12.14)	17.407	2	<.001
Albumin	33.08 (3.41)	34.89 (5.31)	31.87 (5.70)	8.742	2	.013
Haemoglobin	117.42 (14.19)	115.72 (24.06)	122.90 (22.95)	F=1.165	2	.316
Kt/V	1.63 (.39)	-	2.11 (.45)	16.565	1	<.001

Data reported as mean and (sample standard deviation)
[a] Due to missing data n=62 in GH, VT & MH, n=63 in RP &RE, n=64 in BP & SF.
[b] Due to missing data n=31 in PF, RP and RE
[#] Chi square test using Kruskall-Wallis, but where there was a normal distribution, ANOVA was used producing an F statistic.

The use of palliative care in dialysis patients has been researched during the year within the haemodialysis unit with thanks to the palliative care consultant Dr Frank Brennan for his participation in this. Recruitment has now ceased and results of this study will be available for the 2007 annual report.

CKD Clinic Report

Aim

To provide data to the department showing Chronic Kidney Disease (CKD) Clinic performance compared to past statistics.
To ensure all department staff are aware of the clinic and its importance in the decision making processes of patients with ESRF and their families.

Process

The CKD clinic is held on 4west on a Wednesday morning. The clinic is coordinated by the Renal Clinical Nurse Consultant (CNC), Shelley Tranter. All new patients are provided with dialysis options education and pharmacy, social work and nutritional assessment. Patients return to the clinic for follow up as required. Patients requiring review of vascular access are also seen in the CKD Clinic by the Vascular Access Nurse.

Once a patient is referred to the CKD clinic they are tracked on a database which is updated as new information e.g. doctors letters or blood results are available. The database is found on the shared renal drive and can be accessed by renal staff. Patients are flagged at 400 creatinine and GFR 15 and this alerts the Vascular Access Nurse to check for vascular referral in patients on the haemodialysis pathway.

The CKD clinic presentations and outcomes are benchmarked against previous clinic data dating back to April 2002.

Current Status

From January to December 2006, there were 39 new attendees to the CKD clinic; 23 males, 16 females. These were further broken down to the consultants; Prof Brown 16, Dr Chan 5, Prof Kelly 5, Dr Mangos 5, and Dr Trew 8 (see figurer 4).
Follow up appointments are important for supporting patients at different stages of their trajectory to dialysis. There were 22 return visits to the clinic for 2006.

Of the 39 new patients seen this year; there was one death, 2 patients have actively sought a non-dialysis pathway, 4 commenced peritoneal dialysis, 6 commenced hospital haemodialysis and one is on home haemodialysis. The remaining patients remain active on the CKD clinic pathway. The mean age of new patients for 2006 is 63.years.

Of the 31 known ESRF patients who commenced haemodialysis this year (excludes those who commenced haemodialysis due to acute episodes or late referrals), only 20 had attended the CKD clinic pre dialysis. Three of the 19 peritoneal dialysis patients commenced without previous CKD clinic involvement.

Results compared to previous years
The following graphs represent the results compared to previous years.

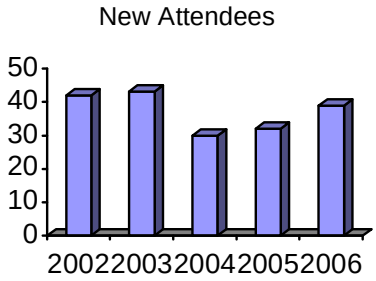


Figure 1

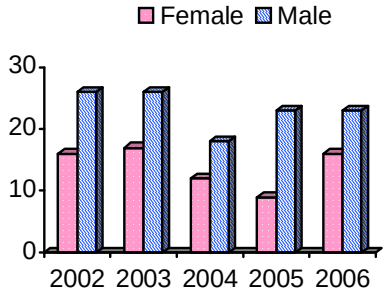


Figure 2

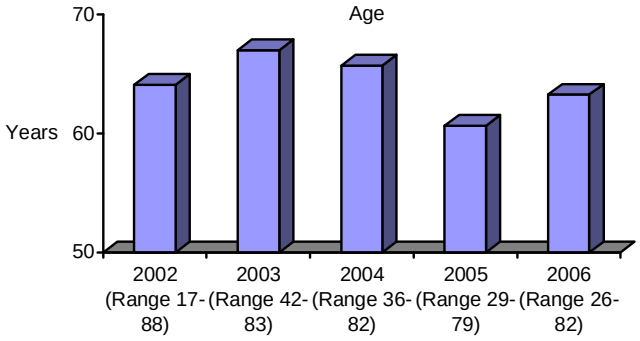


Figure 3

Figure 1 represents the number of new attendees each year. A total of 186 patients have been seen since the commencement of clinic in April 2002.

Figure 2
This compares the number of male and female CKD clients attending the clinic. More males than females have attended clinic since the commencement in 2002, the reasons for this are unknown.

Figure 3
Age of the CKD clientele since its introduction in 2002. The range for 2006 is from 26-82years of age.

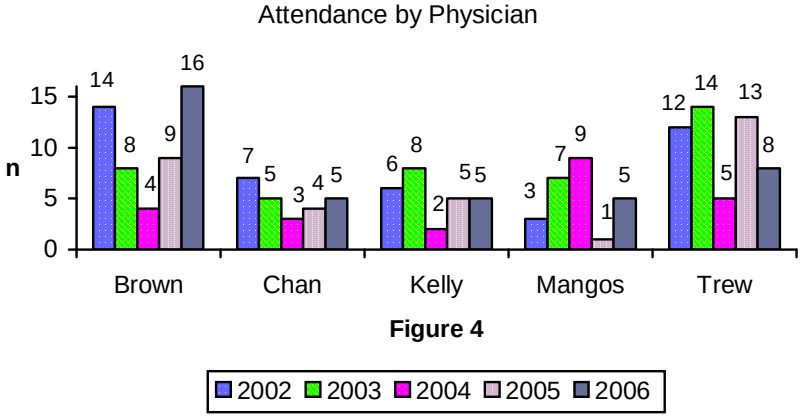


Figure 4

Figure 4
The renal consultants have a large variation in patient populations, which can be roughly reflected in the graph below. Non-English speaking clients often do not attend the clinic, as interpreters are not available for three hours. These patients receive education by other means including one on one with CNC and an interpreter and through their renal consultant and GP's.

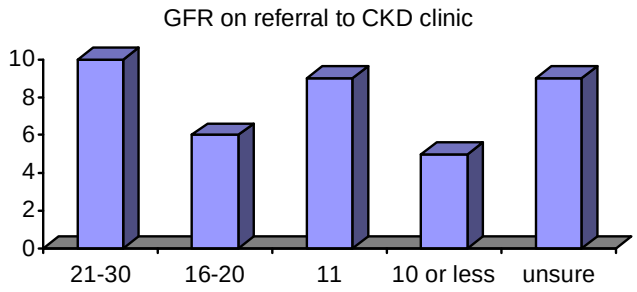


Figure 5

Figure 5
The GFR on referral to the clinic for the 39 new patients in 2006.

Importance of the outcomes to the unit
The guideline for referral to the CKD clinic is creatinine greater than 300 and GFR less than 25. Evidence is available regarding late referral of dialysis patients, this evidence shows that those who are referred late (<3 months before dialysis) have a much greater chance of ending up on hospital haemodialysis and having a central venous line. This group of patients also have a higher morbidity and mortality rate.

Actions/ recommendations/ responsibilities

1. The CKD clinic is an important step on the pre dialysis, or the 'not for dialysis' pathway. The 'Nephrology 2005; 10,S46-S60' journal has pre dialysis suggestions based on level III and IV evidence. The Nephrology Journal 'Acceptance onto Dialysis Guidelines' S46-S48, reinforces the benefits of what we already offer to our CKD patients through the clinic. The CKD clinic presently offers education on the treatment choices available (dialysis types and non dialysis option), pre-dialysis education and contact with multidisciplinary team members for diet education and social work. Clients are referred to the clinic by the nephrologists, but the registrars should also refer any CKD client whom they feel may benefit from the service.

2. The clinic is limited to the amount of follow up information it can source on the patients. Letters from the renal doctors are a very helpful tool in keeping the client information up to date. Some doctors do provide this information, but it would be very useful to have letters from all of the renal physicians.

3. Patients are often not seen at the clinic after the initial visit. The second visit gives the clients an opportunity to ask questions and further discuss options. It is the responsibility of all of the renal doctors to refer the clients for follow-up visits. Presenting this data to the renal meetings is an avenue to make staff aware of the existence of the service and how important it is in assisting patients in making important decisions.

Review
The CKD clinic data will be reviewed again in January 2008 in preparation for the annual report. The next presentation of this topic to the department will be late 2007.

Department of Renal Medicine Report

Renal Biopsy Training Program

In 2006 we continued to train registrars in the technique of renal biopsies. 77 renal biopsies were performed with complications of haematuria in two patients and loin pain in a further two.

The renal biopsy service has been enhanced by the acquisition of a portable ultrasound machine in mid 2006 (General Electrics Logiqbook). This portable device allowed biopsies to be performed in any ward and of course facilitate other diagnostic activities.

IT Development in the Renal Department

Renal information system catalogue (RISC) database.
The RISC database has been deployed in all areas of the Renal Department. It is accessed by nursing staff, allied health staff, resident medical staff and senior medical officers. All dialysis and transplant patients are entered into the RISC database at entry to renal replacement therapy. It continues to be upgraded and supported by the RISC consortium, a group of representatives from various area health services around New South Wales. Upgrades for version 3 to version 5 will occur in early 2007 which will now allow the database to replace paper files in many aspects of the management of these patients.

The RISC database will be available at the Sutherland Satellite Haemodialysis Unit and will facilitate communications between Sutherland and St George Hospital, taking advantage of the local area network that is in place across the Area Health Service. This database will be enhanced further by the availability of the Business Objects reporting tools. The Department of Health is presently developing a set of reporting tools using Business Objects for the RISC database. A standard set of reports will initially be introduced, subsequent ad hoc reporting will be available.

RISCDOC Network Folder

The introduction of a simple yet effective shared network folder has allowed access to a number of important shared documents such as discharge summaries, outpatient clinic letters and more recently copies of prescriptions. These files are then linked to the patient's folder in the RISC database, providing a comprehensive electronic medical record for our dialysis and transplant patients.

SGH Renal Unit Transplantation Report

Twelve renal transplants were performed in the 2006 calendar year, with 8 procedures being deceased donor grafts and 4 being live donor grafts. In the 13 years of the SGH transplant programme to the end of 2006, 123 transplants have been undertaken. For the overall programme,12 month patient survival is 98% and 12 month graft survival is 93%. 55% of patients still have functioning grafts 10 years following their transplant. 80% of procedures have been deceased donor grafts and 20% have been live donor grafts.

Activity in the 4 West transplant outpatient clinic consisted of review of transplant recipients in their first 3 months post-operatively, annual review of patients on the transplant waiting list and clinical assessment of potential live renal donors. During 2006 there were 435 occasions of service in the transplant clinic.

The most recent external audit of transplant outcomes at St George Hospital was provided by an ANZDATA review of outcomes for transplants performed between 1 January 1999 and 31 December 2004. In this audit outcomes of the SGH programme were compared to national outcomes. In this time interval 41 deceased donor and 17 live donor renal transplants were undertaken at St George Hospital. Patient (Figure 1) and graft (Figure 2) survival were comparable in SGH (squares, hatched lines) patients compared to the national average (unbroken lines).

Figure 1

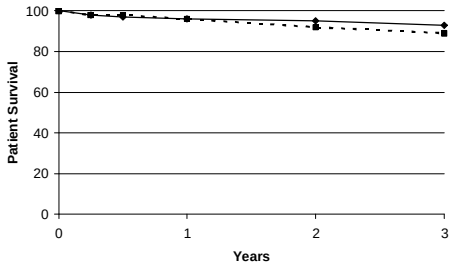
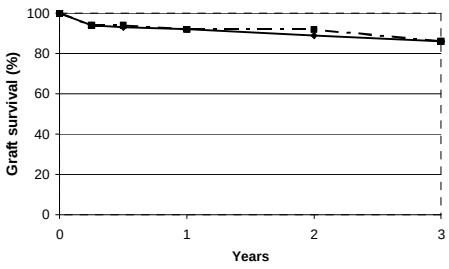


Figure 2



Index patient (Figure 3) and graft (Figure 4) survival were also comparable to national averages. The index group refers to primary deceased donor grafts performed in non-diabetic, non-Aboriginal, non-Maori, non-Pacific Islander recipients aged between 20 and 54 years**.** This subgroup analysis removes some of the variability in outcomes due to differences in patient complexity and to quote ANZDATA "arguably provides the best comparator with the national average"

Figure 3

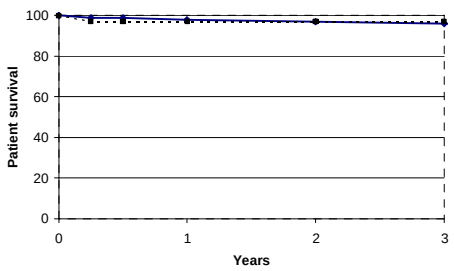
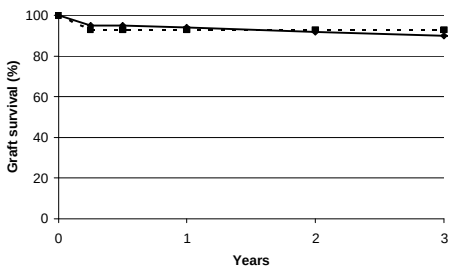
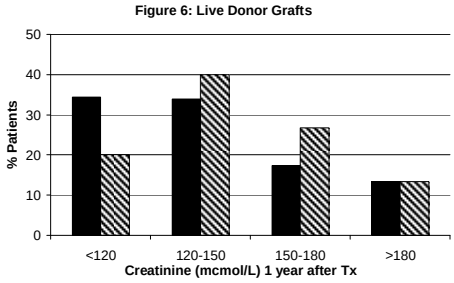
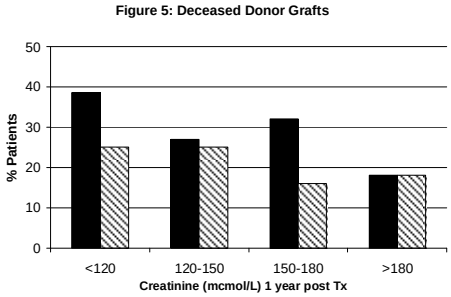


Figure 4

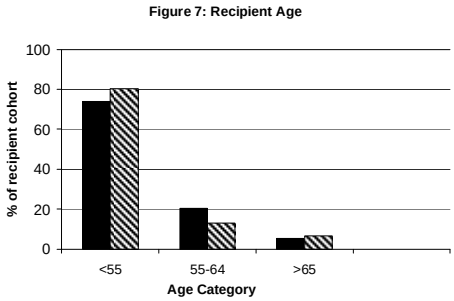


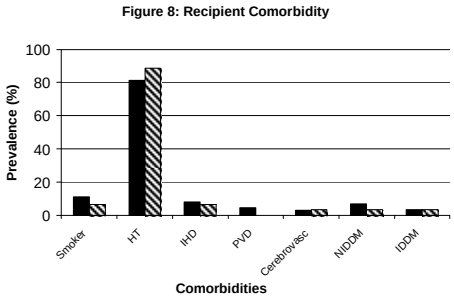
Transplant function in deceased (Figure 5) and live donor (Figure 6) grafts performed at SGH (hatched columns) were comparable to national averages (solid columns) with the majority of transplant recipients achieving a stable serum creatinine of less than 150µmol/L at 12 months following their transplant operation.



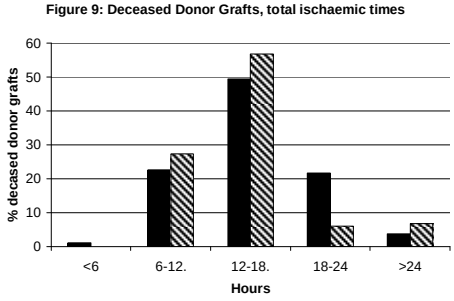


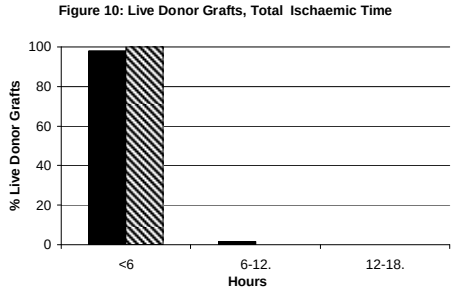
Recipient age (Figure 7) and comorbid conditions (Figure 8) were comparable in the transplant recipients at SGH to that reported nationally.





Total ischaemic times for deceased (Figure 9) and live (Figure 10) donor grafts were comparable to the national average, with the ischaemic times for the majority of deceased donor grafts being less than 18 hours and for all live donor grafts being less than 1 hour.





These data confirm that patient population transplant at SGH is representative of transplant patients in terms of age and comorbid medical conditions, and that the outcomes of patient and graft survival and long term transplant function achieved by the SGH transplant programme are comparable to those achieved nationally.

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http://www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm#28th%20Report

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CARI guidelines: http://www.cari.org.au/guidelines.php

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