The St George Hospital

Renal Department

QUALITY INDICATORS

ANNUAL REPORT

2005

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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. Monitor and report central venous catheter (Vascath) infection and complication rate.

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 28th ANZDATA *(Australia and New Zealand Dialysis and Transplantation Registry)* Report 2005. The ANZDATA 2005 annual report contains data up to the 31st December 2004.

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.

Executive Summary

- The St George Renal Unit commenced the updating of renal protocols in 2005 with an aim to have them available on the intranet to all hospital staff. The aim of making our protocols available on the intranet is to have a consistent high standard of care provided to the renal patients no matter where they are located within the hospital. We believe that without proper quality data assessment it is not possible to determine when changes to protocols are needed or how to assess whether these changes have been successful. The work reported in this document supports better patient management through this process.

- The peritoneal dialysis unit has had a small decrease in total patient numbers over 2005 with a total of 67 patients being treated compared to 74 in 2004. The trend in peritoneal dialysis continues to show an increase in numbers of patients on APD (an increase of 6%), which is higher than the trend reported by ANZDATA (2% increase in APD numbers reported)

- Lipids are measured using the national heart foundation guidelines. Following the '4D' study these guidelines are probably too tight for the group of patients with no co-morbid conditions and need to be widened. Lipid lowering therapy rates have improved over the year between audits.

- 68% of PD patients are High or High Average transporters. This creates potential for problems with fluid overload.

- The Iron protocol for PD is currently being introduced with the hope of a better referral rate of patients for replacement iron. An audit of this will be conducted through the year and adjustments to the protocol made as required.

- Peritonitis organisms have been compared to ANZDATA results showing similar percentages for Fungi, Coag Negative Staph, Staph aureus, non MRSA and Gram negative organisms.

- The figures for patients' peritonitis free at 3 years improved since 2004 to 15%, an improvement of 7%. The peritonitis incidence per patient month compared to ANZDATA has improved slightly in 2005 and is recorded as 1 infection per 15.1 patient months compared to ANZDATA at 19.3 patient months. The peritonitis free survival rate at 3 years compared to ANZDATA has improved since 2004 to 14% (6% improvement), but is still poor compared to the ANZDATA rate of 31%, which has remained consistent over the years. The total percentage of St George patients' peritonitis free since commencement is 45%.

- The majority of patients accepted onto peritoneal dialysis between January 1 and December 31, 2005 were between the ages of 45-64 years. The mean age was 63 years. In 2005, patients accepted onto peritoneal dialysis had less co-morbid conditions than those reported in 2004, and also less than those reported by ANZDATA. The rate of diabetics remains consistent and comparable to that reported by ANZDATA .

- The 4 West haemodialysis unit showed a smaller growth activity for 2005 (3%) compared to 2004 (17%). As of 31st December 2005, there were 127 chronic patients receiving haemodialysis.

- 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 significantly improved iron stores since implementing the program in September 2004. Reductions in the average and median weekly Erythropoietin therapy usage were seen as well as improvements in target Hb levels in our Haemodialysis patients.

- The patients accepted onto dialysis during 2005 were examined. There was a lower rate of late referral compared to previous audits and ANZDATA. An increase of 7% was seen in patients starting haemodialysis between the ages of 25-35, though St George still has a higher incidence of patients over the age of 65 commencing haemodialysis than ANZDATA. There were more females starting haemodialysis in 2005 as well as patients with coronary artery disease, diabetes and cerebrovascular disease. The incidence of cerebrovascular disease was 18% higher than ANZDATA.

- St George has a 14% lower late referral rate than the 2005 ANZDATA report for haemodialysis. 2005 showed similar results in patients commencing haemodialysis with a functioning vascular access compared to previous audits. Additionally, St George has a 10% lower rate of patients commencing haemodialysis with a functioning vascular access than ANZDATA.

- The dialysis patients were surveyed for quality of life using the Short Form 36 questionnaire in 2004. As a result of the survey, a team has commenced a research project aimed at improving the quality of life of dialysis patients by palliative care consultation.

- Renal biopsies were audited during 2005 for patient characteristics, adequacy and complications.

- The Chronic Kidney Disease (CKD) clinic operates one on one with chronic kidney disease patients and their important others in 4 West clinic rooms. In 2005 there were 32 new attendees, 23 male and 9 female.

- There were 9 transplants in 2005; 8 deceased donor grafts and 1 living related. The transplant program at St George Hospital has been running for 12 years, 55% of patients transplanted still have functioning grafts at 10 years. The transplant waiting list continues to increase in parallel with increased dialysis activity in the unit.

- 3 West Renal/Gastro/Immunology Ward relocated to 4 South.

HAEMODIALYSIS

The total Haemodialysis activity level for 4 West increased from 19,694 dialyses in 2004 to 20,300 in 2005 i.e. a 3% increase in activity. This result shows a smaller growth in activity compared to the same period last year (17%).

TOTAL HAEMO SESSIONS
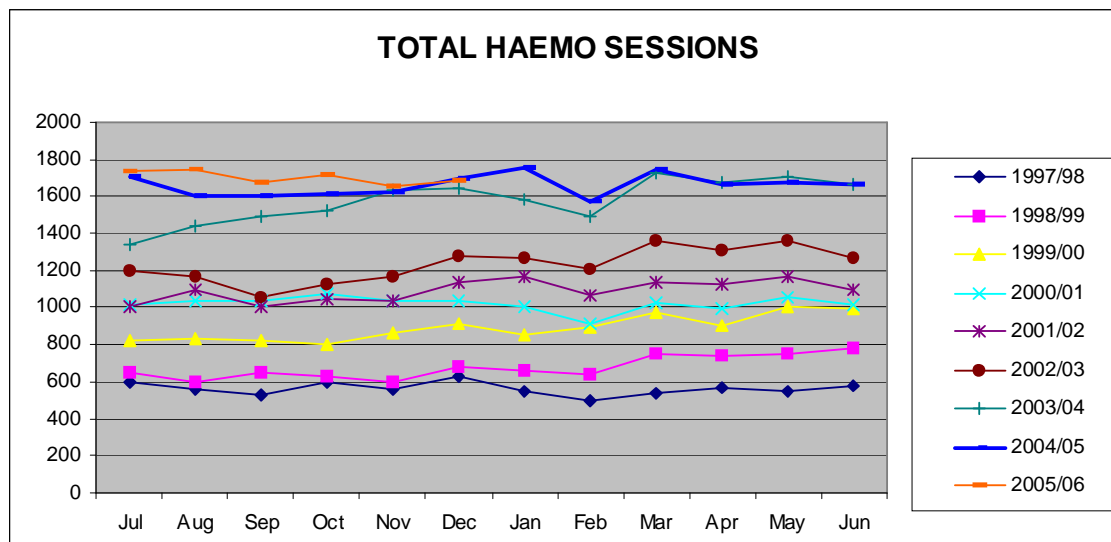
Patient Flow:

Existing 4 West HD patients January 1st 2005 =124 (excludes home HD patients)

In	New patients	28
	Transfers from other units	2
	Temporary transfers from PD	4
	Permanent transfers from PD	8
	Failed Transplant	2
	Return from Home haemodialysis	3
Subtotal		47

Out	Transplants	4
	Transfers to other unit	4
	Transfers to Home haemodialysis	8
	Transfers overseas	3
	Transfers to PD	2
	Deaths (medical cause)	12
	Deaths (withdrawal from dialysis)	10
	Regain renal function	1
	Subtotal	44

Net gain = 3
Chronic haemodialysis patients at end of 2005 = <u>127</u>

Comments

In comparison with the Peritoneal Dialysis report 3 patients were not considered permanent transfers to PD as they refused to complete training.

This indicates the following major activity rates when compared to ANZDATA:

	St George (HD)	ANZDATA
Transplant	3%	7%
Death (medical causes)	9%	11% (All HD)
Death (withdrawal)	8%	4% (All HD)

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 February (from 128 chronic haemodialysis patients) and October (from 122 chronic haemodialysis patients) 2005.

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
- Lipid target range is set by the National Heart Foundation for high risk patients
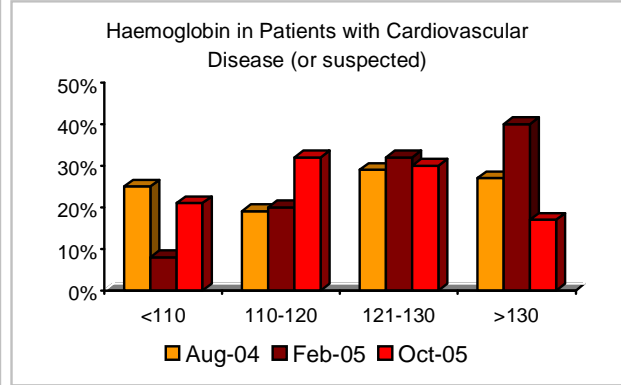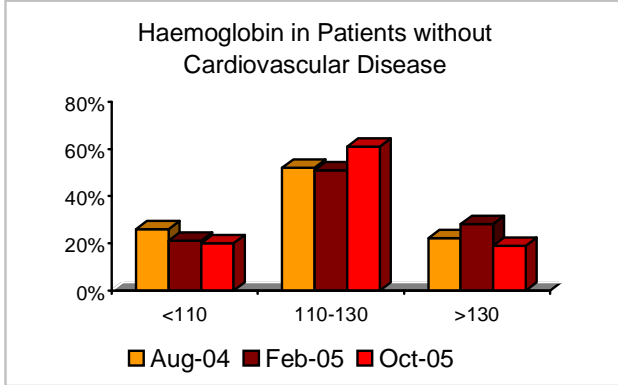
How did we Record, Store and Analyse the Data?
- Blood results were entered into an Excel Database
- Basic statistics performed using SPSS 13 to obtain mean, median, standard deviation, number, minimum and maximum
- Analysis of data to previous audits attended using SPSS. Chi Square and Paired T-Test analysis were used.
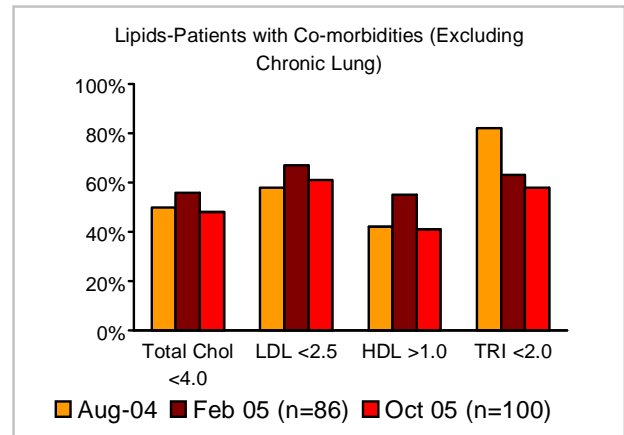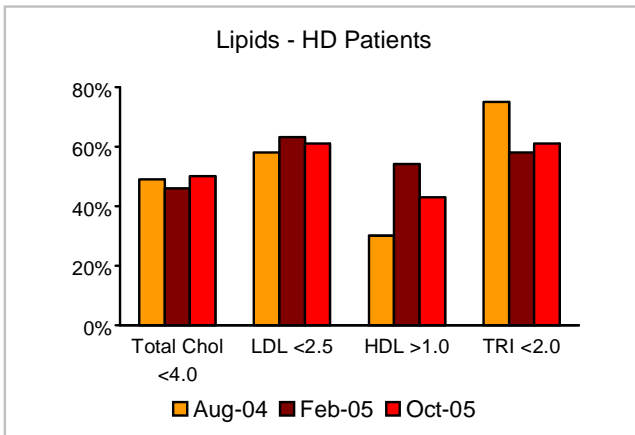
Outcomes: Percentage falling within CARI target ranges

Parameter	Target	FEB 2004	AUG 2004	FEB 2005	OCT 2005
Ca	2.25- 2.75mmol/L	75	72	73	66
Corr Ca	2.2-2.6 mmol/L	79	78	78	82
PO4	≤1.8 mmol/L	61	56	61	70
CaPO4	≤4.2 mmol/L	55	56	53	66
Ferritin	100-800 ug/L	60	63	86	82
Fe Sats	20-50%	61	51	70	73
Mg	0.74-1.03 mmol/L	65	54	57	60
Albumin	33-48 g/L	66	61	70	67
Bic	20-30 mmol/L	97	96	97	100
PTH	10-15 nmol/L	8	9	11	7
KT/V	≥1.2	95	89	93	91

- The CARI guidelines recommend the haemoglobin level in patients with significant cardiovascular disease should not exceed 120 g/L unless clinical circumstances dictate otherwise. For the haemoglobin audit, haemodialysis patients were divided according to the presence of cardiovascular disease.

Haemoglobin in Patients without Cardiovascular Disease

Categories: <110, 110-130, >130
Legend: Aug-04, Feb-05, Oct-05

Haemoglobin in Patients with Cardiovascular Disease (or suspected)

Categories: <110, 110-120, 121-130, >130
Legend: Aug-04, Feb-05, Oct-05

- The lipid target range used is by the National Heart Foundation for high risk patients. This may result in target levels being too low for patients not at risk. Therefore, the audit results were divided into two groups, all haemodialysis patients and those patients with co-morbidities (excluding lung).

Lipids - HD Patients

Categories: Total Chol <4.0, LDL <2.5, HDL >1.0, TRI <2.0
Legend: Aug-04, Feb-05, Oct-05

Lipids-Patients with Co-morbidities (Excluding Chronic Lung)

Categories: Total Chol <4.0, LDL <2.5, HDL >1.0, TRI <2.0
Legend: Aug-04, Feb 05 (n=86), Oct 05 (n=100)

Paired T-test *p=<0.05

Comparison with Previous Audits, CARI Guidelines and 2005 ANZDATA report

Minimal changes were seen amongst Biochemical and Haematological markers.

1. There was a 59-80% achievement for CARI recommended range for Ca, Corr Ca, Mg, PO4, CaPO4, and Albumin levels.
2. Ferritin and Iron Saturation levels improved in 2005 with 82% achievement of the recommended ferritin range and 73% achievement of recommended Iron Saturation range. A total 63% of patients achieved normal iron studies.
3. Dialysis delivery is excellent with 93% of patients in February and 91% of patients in October achieving recommended Kt/V.
4. Achievement for CARI recommended range for CaPO4 was 53% in February and 66% in October.
5. An improvement in PO4 level was seen in October with 70% of patients within the recommended CARI range.
6. The serum Ca, PO4 and CaPO4 results from October were similar to the 2005 ANZDATA.
7. Achievement of the recommended range for PTH remains a challenge with 7-11% of haemodialysis patients within the recommended range.
8. A reduction from 40% to 17% was achieved over the year for patients with cardiovascular disease and a Hb level greater than 120 g/L.
9. Sixty one percent of patients without cardiovascular disease have an Hb level between 110 – 130 g/L. The October audit indicated all patients with Hb between 110-130 was 13% more than ANZDATA.
10. A reduction in the use of Eprex and Aranesp was seen over 2005. The average and median weekly dose for Eprex reduced from 11,310 and 10,000 in 2004 respectively to 9,316 and 8250 in 2005. Additionally the average and median weekly dose for Aranesp reduced from 44.5 and 40 in 2004 respectively to 36 and 35 in 2005.

Actions

Changes to the nurse initiated iron program were required in March 2005 due to increasing Hb levels >130g/L. These changes highlighted the need to reduce or cease Erythropoietin therapy until an adequate Hb was achieved. A significant improvement to Hb levels resulted from this change comparing the February and October audits.

A nurse lead calcium and phosphate committee formed to develop a nurse initiated protocol and learning packages in order to improve calcium and phosphate levels.

Recommendations

- Greater attention continues to be required in the monitoring and treatment of hyperparathyroidism.
- Development of a nurse initiated protocol to improve calcium and phosphate management.

HAEMODIALYSIS WATER QUALITY

Background and Activity Levels
- The water quality is audited in the 4 West dialysis unit 2nd monthly for microorganisms, aluminum, chloramines and total chlorine.
- Full element analysis is conducted 6th monthly.
- The Biomedical department is responsible for collecting the water specimens for analysis 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
- The audit ensures results comply with AAMI standards.

Date	H2O (<200 CFU/mL)	Dialysate (<2000 CFU/mL)
Jan 2005	210 CFU ICU 5	Normal range
Mar 2005	Normal range	Normal range
May 2005	Normal range	Normal range
July 2005	Normal range	Normal range
Sept 2005	Missed	Missed
Nov 2005	>250 CFU 4W, ICU, CICU	Normal range

Date	Elements Al 0.01mg/L, Chloramines 0.1mg/L, Total Cl 0.5mg/L
Jan 2005	↑Fluoride Water plant, No testing outside 4W & 3W, ↑Sulfate 4W & 3W
Feb 2005	↑Fluoride Water plant, No testing outside 4W & 3W, ↑Sulfate 4W & 3W
Mar 2005	Normal range
May 2005	Normal range
July 2005	4W Normal range. ↑Fluoride & Cadmium ICU
Sept 2005	Missed
Nov 2005	Normal range

Outcomes
- Inadequate water testing and follow up occurred in 2005. September collection was missed as well as failure to take action on abnormal results.
- No action was taken with the increased Fluoride and Cadmium levels as samples were obtained prior to RO and levels within unit were within the normal range.
- All other specimens were within the recommended AAMI range.

Recommendations
- Copies of all microbiology analysis performed by Sonic food and water testing are to send the results to 4W NUM to overview and ensure the Biomedical depart follows up abnormal results.
- Copies of all water analysis to be stored on 4W.
- Water sampling in pre treatment areas (ICU, CICU) to be tested using a portable RO to ensure appropriate element levels are removed.
- The Biomedical department to take greater responsibilities in complying with 2004 AAMI standards.

CENTRAL VENOUS CATHETERS

Background

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

How did we Record, Store and Analyse the Data?

Data is collected and entered into the vascular 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.
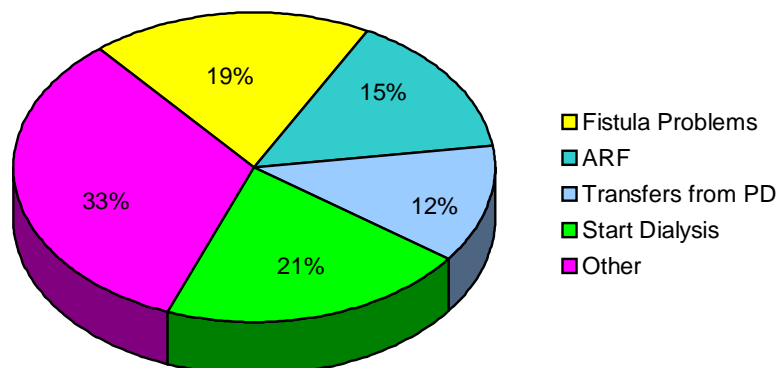
Activity Level
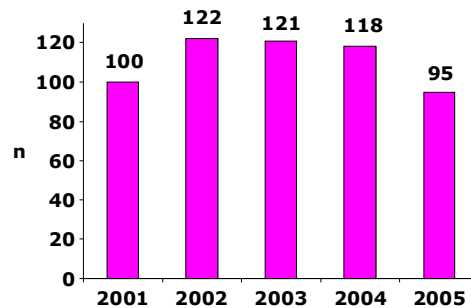
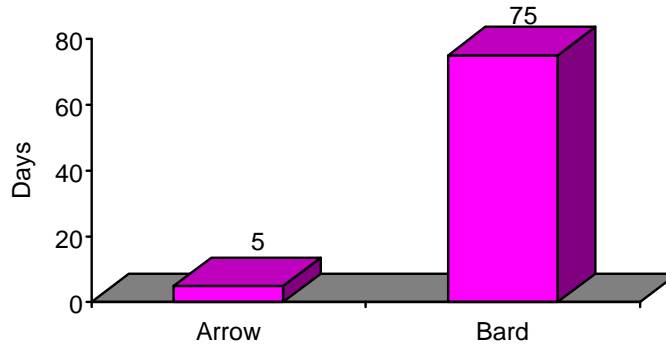### Type of catheters inserted in 2005

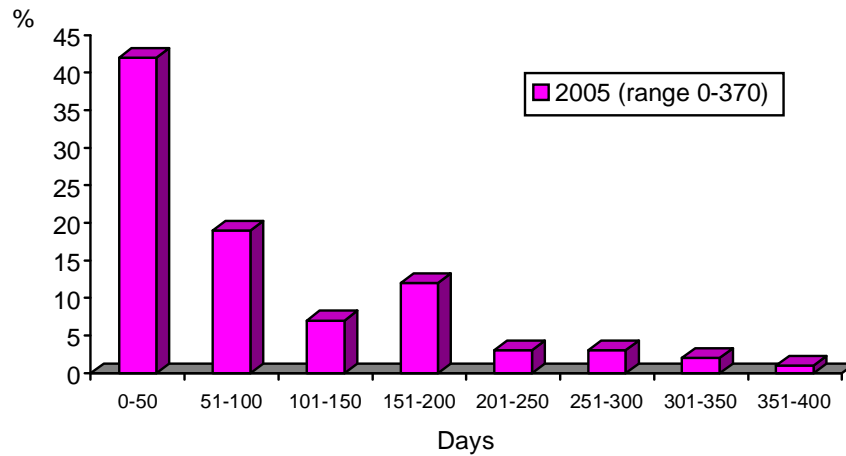Tunneled – Bard 81% (n=77).
Non –Tunneled - Arrow 19% (n=18)
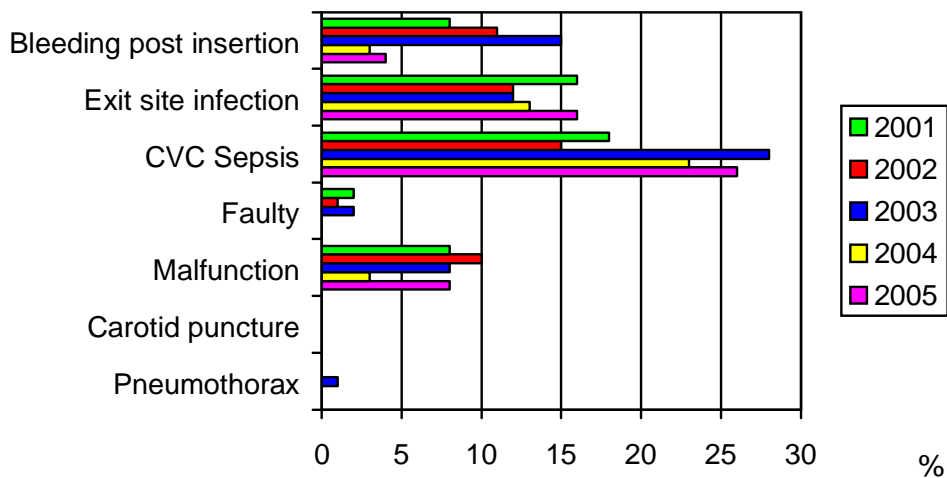
Reason for insertion of catheters in 2005
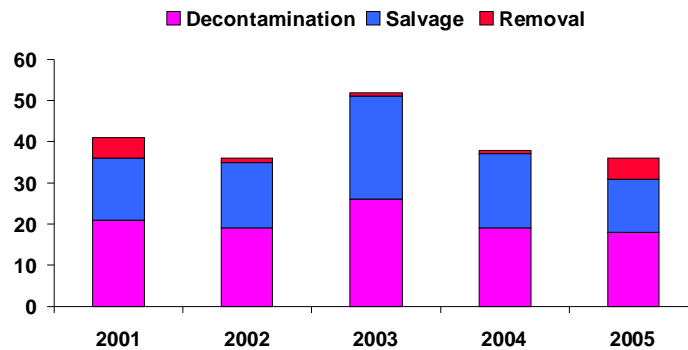
Average days CVC insitu

**Length of Time CVC in Use**

Complications

Decontamination for suspected CVC sepsis

Outcome of Decontamination Protocol

- Decontamination for infected CVCs continued during 2005.
- 18 CVCs were decontaminated in 2005.
- Decontamination was required on average 64 days (range 3-195 days) post catheter insertion.
- 5 CVCs were removed 1-24 days post decontamination due to continual sepsis.
- 72% of CVCs decontaminated were salvaged.
- Decontamination was not attempted on 7 CVCs that were infected subsequently removed.

Reason for removal
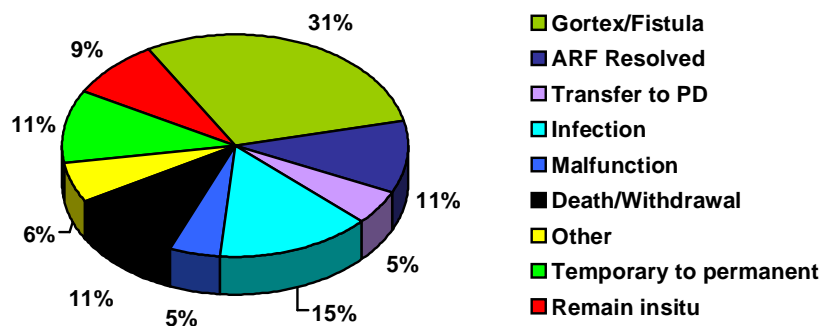
Outcomes

- The number of central venous catheters inserted during 2005 was less than previous years. The main reason for insertion of a central venous catheter is to start haemodialysis.
- The main reason for removal of central venous catheters is fistula maturation.
- The CVC infection rate increased from 23% (2.9 infections/catheter days) 2004 to 26% (3.5 infections/catheter days) 2005.
- The exit site infection rate also increased from 13% (1.7 infections/catheter days) 2004 to 16% (2.1 infections/catheter days) 2005.

Recommendations

Trial the use of a chlorhexidine gluconate impregnated dressing (Biopatch) to reduce the incidence of exit site infections. A randomized controlled trial proposal was developed and offered to Johnson and Johnson for financial assistance in supplying the Biopatch. If financial assistance fails other avenues to reduce infection rates such as the use of Medihoney will be further investigated.

More aggressive screening and eradication of MRSA prior to central venous catheter insertion is required. All patients who require a central venous catheter are now swabbed for MRSA status prior to insertion and treated with Mupirocin. These data will be monitored in future reports.

Literature supports the use of a prophylactic Gentamicin/Heparin lock to reduce the incidence of catheter related infections. The unit has now implemented this into the haemodialysis protocol due to the ongoing CVC infection rates.

ACCEPTANCE ONTO HAEMODIALYSIS

Background

Two audits have previously reported the characteristics of patients commencing haemodialysis in our unit.
The data for this audit consisted of patients who commenced haemodialysis (incentre) in 2005.

How did we Record, Store and Analyse the Data?

Data was collected from ANZDATA, 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
- Smoking habit
- BMI
- Late referrals (< 3 months pre dialysis)
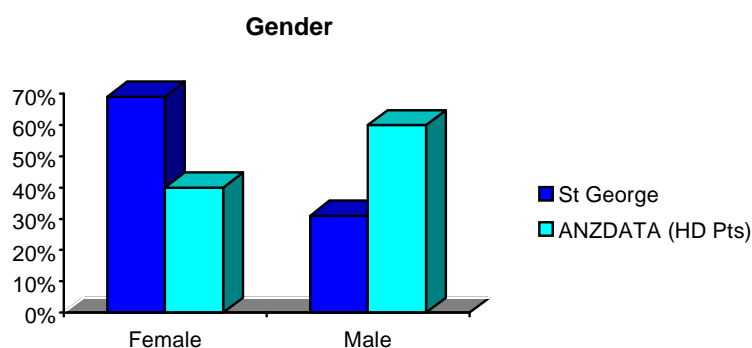- Who had a functioning fistula at entry

Data Benchmark

Audit results are compared to the previous audit (October 2003 until December 2004) and ANZDATA 2005 report

Activity
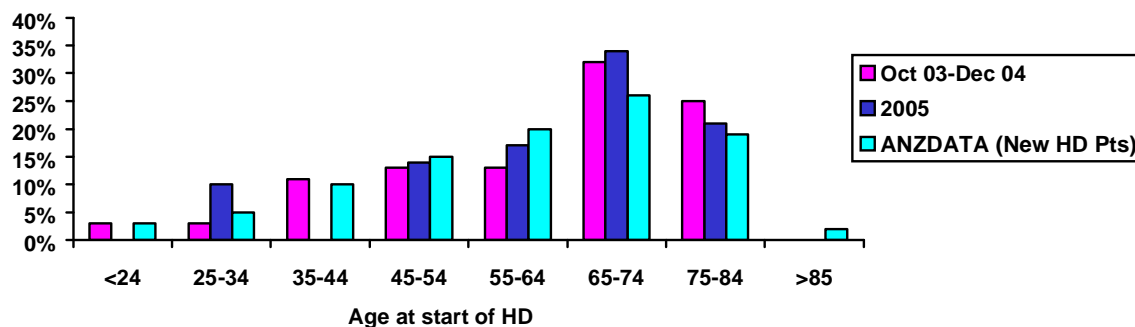
29 patients commenced chronic incentre haemodialysis with no previous dialysis in 2005.

Outcomes

Gender

16

Age at Commencement of Haemodialysis

Ethnicity of patients commencing haemodialysis in 2005
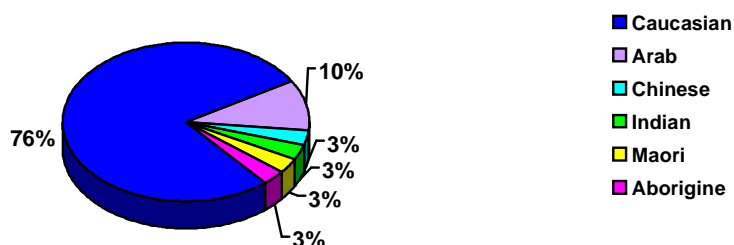
Co-morbidities present at commencement of haemodialysis

Co-morbidity	St George (Oct 2003-Dec 2004)	St George 2005	ANZDATA (HD pts)
Chronic Lung Disease			
▪ Yes	13%	17%	12%
▪ Suspected	3%	0%	3%
▪ No	84%	83%	85%
Coronary Artery Disease			
▪ Yes	45%	48%	34%
▪ Suspected	3%	7%	8%
▪ No	52%	45%	58%
Peripheral Vascular Disease			
▪ Yes	26%	24%	19%
▪ Suspected	0%	0%	7%
▪ No	74%	76%	73%
Cerebrovascular Disease			
▪ Yes	18%	31%	10%
▪ Suspected	3%	0%	3%
▪ No	79%	69%	86%
Diabetes			
▪ Yes	39%	55%	56%
▪ No	61%	45%	44%
Smoking			
▪ Never	63%	45%	47%
▪ Former	24%	48%	40%
▪ Current	13%	<1%	13%
Late Referral	26%	10%	24%

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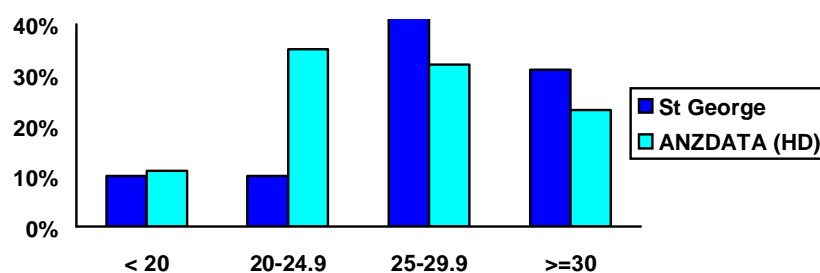
BMI <20 indicates underweight, 25-29.9 overweight and ≥30 obese.

GFR

Minimum GFR was 4.2 ml/min/1.73 m^2.
Maximum GFR was 33.4 ml/min/1.73 m^2.
Average GFR was 11.32 ml/min/1.73 m^2.
Median GFR was 9.7 ml/min/1.73m^2.
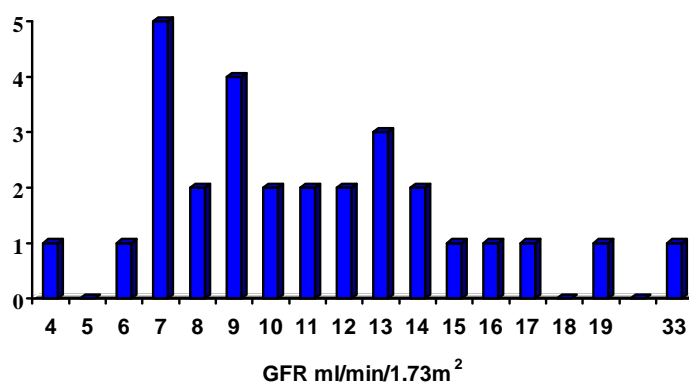
Recruitment for the Ideal Study continues. During the 2005, nine patients were recruited. Four were randomized and three have commenced dialysis (1 to haemodialysis and 2 APD).

Vascular Access

Access used for new patients commencing their first haemodialysis in 2005 at St George compared to ANZDATA 2005 report.

First Access Haemodialysis		
First Access	**ANZDATA (2004)**	**St George 2005**
Native	36%	29%
Synthetic	2%	4%
Tunnel CV	37%	57%
Non Tunnel CV	25%	11%

Fistulas in patients starting haemodialysis at St George 2005

```
                    ┌─────────────────┐
                    │     n=29        │
                    │ 10% late referral│
                    └────────┬────────┘
         ┌───────────────────┼───────────────────┐
┌────────────────┐  ┌────────────────┐  ┌────────────────┐
│ Fistula created│  │ Not attempted  │  │ Fistula created│
│  before 1st HD │  │   n=3 (10%)    │  │   after 1st HD │
│  n=13 (45%)    │  │  (2 PD, 1 HD)  │  │   n=13 (42%)   │
└───────┬────────┘  └────────────────┘  └───────┬────────┘
   ┌────┴─────┐                            ┌─────┴────┐
┌──────────┐ ┌──────────┐          ┌──────────┐ ┌──────────┐
│Successful│ │  Failed  │          │Successful│ │  Failed  │
│n=9/13    │ │n=4/13    │          │n=9/13    │ │n=4/13    │
│(69%)     │ │(31%)     │          │(69%)     │ │(31%)     │
└────┬─────┘ └────┬─────┘          └──────────┘ └────┬─────┘
┌──────────┐ ┌──────────┐                      ┌──────────┐
│Mature for│ │Further   │                      │Further   │
│1st HD    │ │attempt   │                      │attempts  │
│n=8/29    │ │pre HD    │                      │n=4       │
│(28%)     │ │n=3       │                      │(all      │
│          │ │(2 used   │                      │successful)│
│          │ │1st Dx)   │                      │          │
└──────────┘ └──────────┘                      └──────────┘
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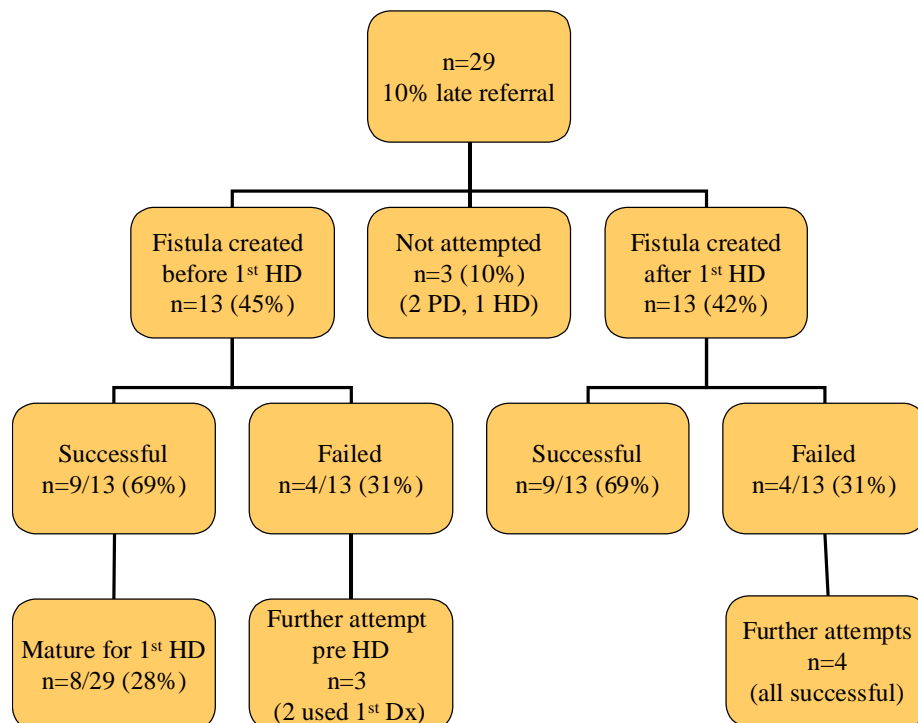
Comments

1. Three patients (10%) starting haemodialysis in 2005 were late referrals. St George has a 14% lower rate than the 2005 ANZDATA report for late referrals.
2. The 65 – 74 yr age group contains the largest percentage of patients commencing haemodialysis. Thirty three percent of St George patients fall into this group. New patients commencing haemodialysis at St George of age 65 or older is 8% more than ANZDATA. There was a 7% increase in new patients commencing haemodialysis between age group 25-34. An increase in the female gender was seen in 2005 (70%).
3. New St George patients in this audit have a similar incidence of chronic lung, and peripheral vascular disease when compared to the previous audit and ANZDATA. The incidence of coronary artery disease has increased from the previous audit and ANZDATA by 7%. Thirty one percent of new patients commencing haemodialysis have cerebrovascular disease, which is 10% higher than the previous audit and 18% higher incidence than ANDATA (13%). The incidence of diabetic patients commencing haemodialysis in this audit is 55%, which is higher than the previous audit (39%). ANZDATA has a similar rate to St George (56%).
4. Forty five percent of patients commencing haemodialysis in 2005 had a vascular access attempted before their first dialysis session. Twenty eight percent of new patients had a mature functioning fistula for their first session. ANZDATA report the use of vascular access (native and graft) for first dialysis at 38%.
5. ANZDATA have a higher incidence of non-tunneled CVCs used for first dialysis (25%) compared to St George (11%). However the incidence of tunneled CVC use is higher at St George (57%) compared to ANZDATA (37%).

Actions to be taken

Continued emphasis on timing for creation of vascular access prior to first dialysis session. The appointment of a 'vascular nurse' in dialysis will enable better tracking of all pre-dialysis patients to ensure they have vascular access created in a timely fashion.

PERITONEAL DIALYSIS

The peritoneal dialysis unit has seen a steady decrease in total patient numbers in the past year with a total of 67 patients being treated in 2005 compared to 74 in 2004. In December the percent of patients receiving *automated peritoneal dialysis (APD)* was 50% and the number receiving *continuous ambulatory peritoneal dialysis (CAPD)* 50%.

CAPD Monthly Patient Numbers

APD Monthly Patient Numbers

Total Peritoneal Dialysis Patients per Month
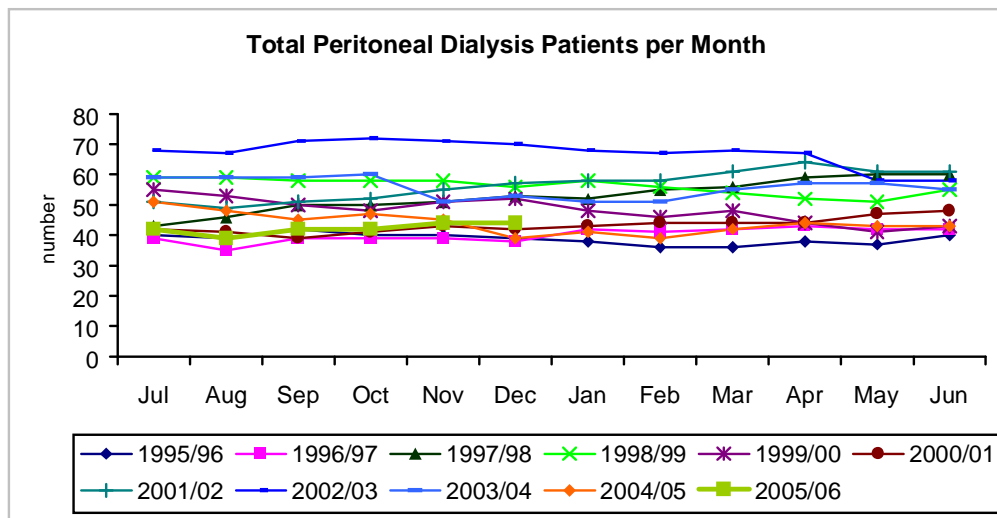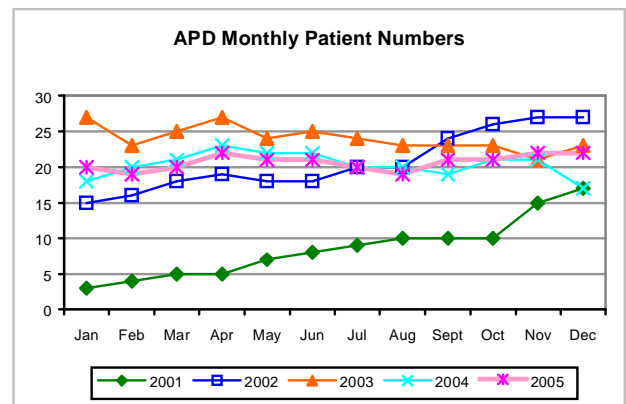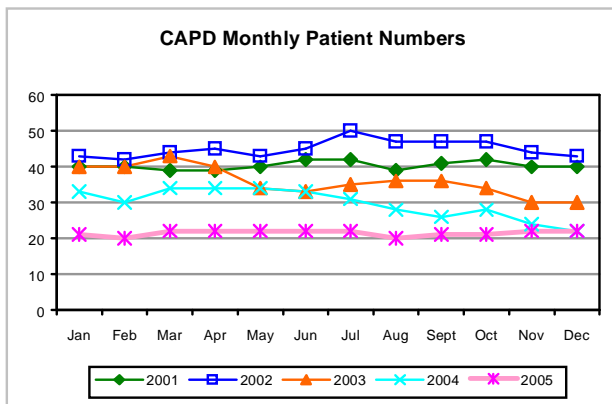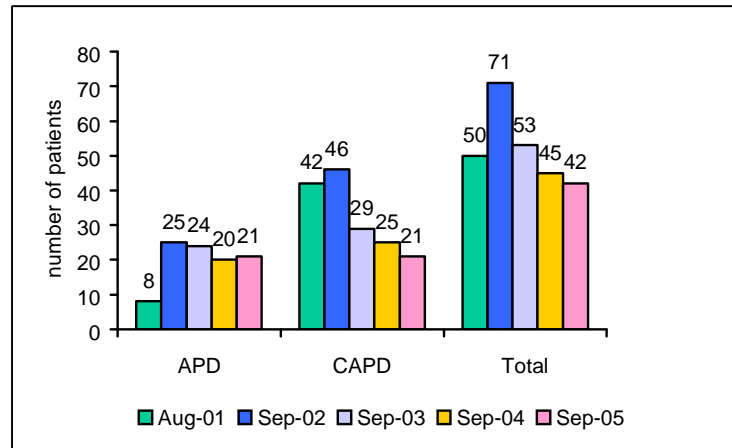
Comparison with:

The ANZDATA 28[th] Annual Report 2005

- ANZDATA results show a very small increase (2%) Australia wide for the percentage of people using Automated Peritoneal Dialysis (APD). This is a big decline in the growth of 19% the previous year. St George peritoneal dialysis unit continues to increase the numbers of patients on automated peritoneal dialysis. At the end of 2005 the APD population had increased by 6%, which is greater than the total Australian growth reported by ANZDATA. The St George CAPD population continues to decline; down by 14% from December 2003.

APD	*ANZDATA 39%*	*St George 50%*
CAPD	*ANZDATA 61%*	*St George 50%*

Patient Flow – Peritoneal Dialysis

Peritoneal dialysis patients as at 31.12.2004 (n=39)

* 2 new patients for training included in this number, the remaining patients were previously trained at the parent hospital.

In	New Patients	18	
	Returns from HD	8	
	*Transfers from other units	5	
	Subtotal		31
Out	Transplants	1	
	Transfer to other units	0	
	Transfer to Home Haemodialysis	0	
	Temporary Transfers to Haemodialysis	6	
	Permanent Transfers to Haemodialysis	11	
	Withdrawal from dialysis	2	
	Deaths on Haemodialysis (1 withdrew treatment)	2	
	Deaths on CAPD	4	
	Alive on hospital APD	0	
	Subtotal		26
	Net Gain	**5**	
	PD patients at end of 2005 =		**44**

This table indicates the following activity rates using the ANZDATA 28[th] annual report for comparison

	ST GEORGE 2005 (%)	ANZDATA 2005 (%)
Transplants	1	8
Change to haemodialysis	25	28
Deaths on Dialysis (PD)	6	13
Death due to withdrawal	3	3

Patients change to haemodialysis for a variety of reasons.
- 2 refusals to do peritoneal dialysis once training had commenced
- Cancer diagnosis
- Peritonitis (major cause)
- Tenckhoff fell out
- Tunneled infection
- Hernia repair

The rate of death on peritoneal dialysis is considerably lower than the reported ANZDATA Australian rate, and the withdrawal rate is equal.

The rate of transfer to haemodialysis is close to the percentage for ANZDATA.

Note:

The rates for St George are calculated using the total number of patients who have been on peritoneal dialysis throughout the year (n=67). The ANZDATA percents are calculated using the total number of patients on peritoneal dialysis at 31.12.2004 (n=1778)

Workload

In 2005 the PD unit provided 139 training days (14 less than 2004) for PD patients and 5477 occasions of service (210 less than 2004). The occasions of service include nurses outpatients, doctors outpatients, home visits, patient/staff education and phone contact. This is outlined in the following chart:
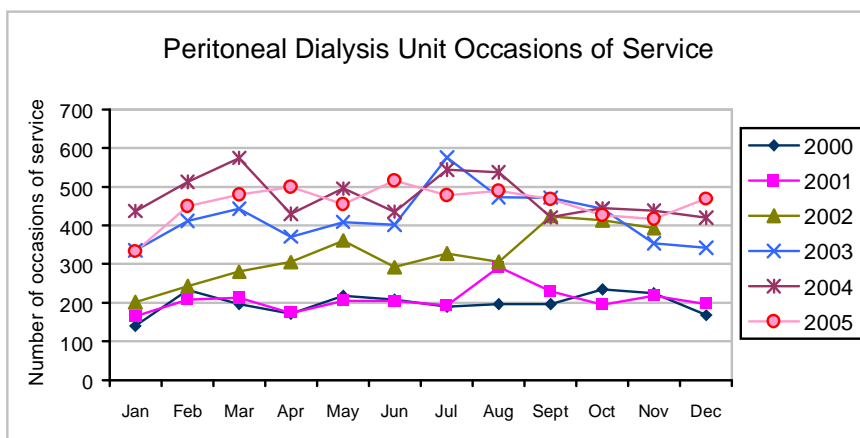
The CAPD clinic provides services to inpatient and outpatient peritoneal dialysis patients; dialysis and transplantation clinics, post operative Tenckhoff insertion inpatient follow-up, home visits, phone contact and dialysis training in conjunction with ongoing patient education.

PD Dialysis Adequacy, Biochemical and Haematology targets

Aim
To compare dialysis adequacy using haematological biochemical markers and Kt/V with previous audits conducted in March '04 (55 patients), September '04 (47 patients), April '05 (41 patients) and October '05 (45 patients). These are performed at 6-month intervals as per the CARI recommended guidelines.

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 - November 2005 of 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 collect 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 officer collates these results into spreadsheets using Microsoft Excel and SPSS v13 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 plans of action are researched. A unit member will then be nominated to take responsibility for the action while the quality assurance officer will follow up and report the results in 6 monthly intervals.

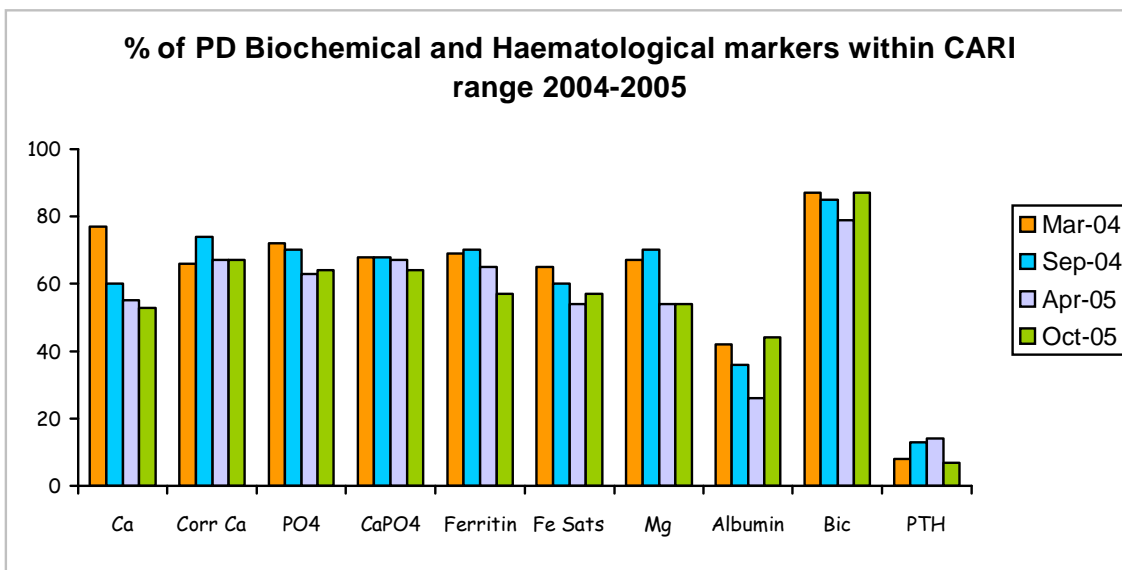### Percentage of patients who achieved a Kt/V $\geq$ 1.7
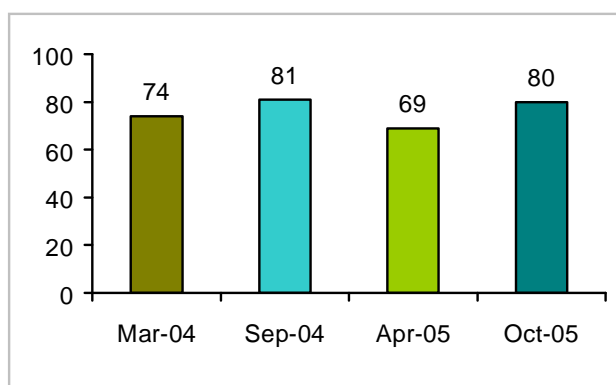
Statistics:

KT/V Oct 05 compared with April 05:

Non Parametric related Wilcoxon test: $p < 0.05$

Oct 05 Median and Interquartiles: 2.01 (1.73, 2.47)

% of PD Biochemical and Haematological markers within CARI range 2004-2005

Results: % of patients falling within the target range

Parameter	Target	Mar 04	Sept 04	Apr 05	Oct 05
Ca	2.25-2.75 mmol/L	77	60	55	53
Corr Ca	2.2-2.6 mol/L	66	74	67	67
PO4	≤ 1.8 mmol/L	72	70	63	64
CaPO4	≤ 4.2 mmol/L	68	68	67	64
Ferritin	100-800 ug/L	69	70	65	57
Fe Sats	20-50%	65	68	54	57
Mg	0.74-1.03 mmol/L	67	70	54	54
Albumin	33-48 g/L	42	36	26	44
Bic	20-30 mmol/L	87	85	79	87
PTH	10-15 nmol/L	8	13	14	7
KT/V	≥ 1.7	72	81	69	80
CCL	> 50L	65	81	59	67.5

Comments

In October 2005, only 7% of peritoneal dialysis patients had a PTH within the recommended limits set by CARI of 10-15nmol/L. 28% had a level less than 10 while 65% had a level greater than 15 with the maximum recorded at 165. The median was 28.9. A non-parametric, related samples, Wilcoxon Signed ranks Test was performed which showed no significant result ($p = 0.8$); the median and interquartiles were 28.9 (8,50.8)

Calcium Phosphate product results have not improved in 2005 with a slight fall of 4% since 2004.

Ferritin and Iron saturations have been disappointing, but with the introduction of a more formalized process of referring patients for Iron infusions we are looking for an improvement this coming year. The peritoneal dialysis nurses will be providing clinic doctors with iron results and recommending patients for iron infusions. The arranging of the iron infusions will occur through the doctors at the clinic appointments, but the patients will have to organize the appointment time with ambulatory care 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.

Lipids

Lipids are measured to compare patients with co morbid conditions (coronary artery disease, cerebral vascular disease, peripheral vascular disease, and diabetes) due to an ongoing uncertainty regarding the tightness of the limits recommended by the National Heart Foundation. The National Heart Foundation Position Statement on Lipid Management 2005 states that statins for people with kidney impairment should be recommended on an individual basis; this is pending the results of trials. This position statement also recommends some changes to the Lipids.

- There is now a greater emphasis on lipid subfractions rather than total cholesterol.

Patients in our unit for whom no immediate indication for lipid lowering therapy exists, are being entered into the SHARP study which is a multi-centre international trial that seeks to determine the benefits and risks of lipid lowering drugs in chronic renal failure.
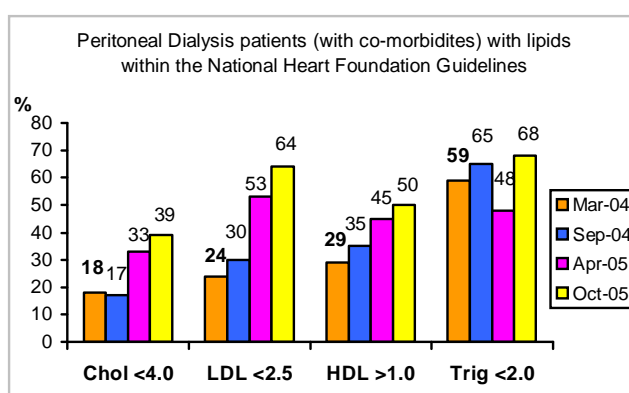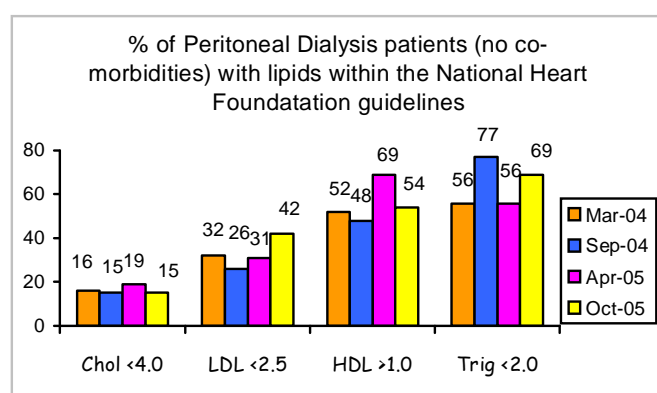

Table 1: Statistics for the Lipids of patients with *none of the listed co morbid conditions* for October 2005:

	Cholesterol	Triglycerides	HDL	LDL
Mean	4.9	1.75	1.27	2.70
Standard Deviation	1.17	0.73	0.52	0.96
Minimum	3.3	0.9	0.7	1.4
Maximum	7.7	3.4	2.7	4.5

Table 2: Statistics for the Lipids of patients with *at least one of the listed co-morbid conditions* for October 2005:

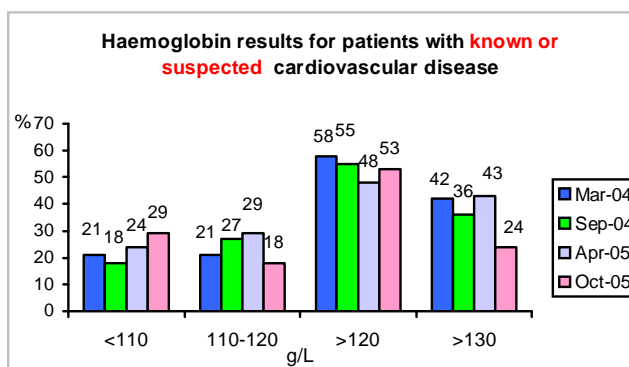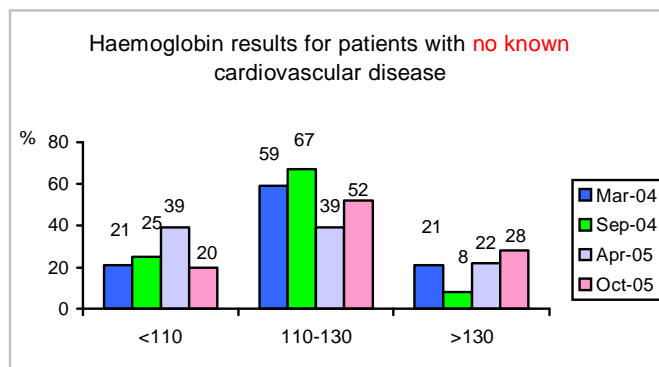|	Cholesterol	Triglycerides	HDL	LDL
Mean	4.15	1.69	1.06	2.31
Standard Deviation	1.0	0.98	0.31	0.85
Minimum	2.6	0.6	0.6	1.1
Maximum	7.0	3.4	2.7	4.5

Diabetics and non-diabetics have been compared in the following graph.

- An independent samples *t*-test showed no significance in these results, therefore, there is no significant difference between the lipids of diabetics and non-diabetics.

Comparison of Diabetics and non diabetics Lipid results which fall within the National Heart Foundation recommended range.

	Chol <4.0	LDL <2.5	HDL >1.0	Trigs <2.0
Diabetics April 05	55	63	38	73
Non Diabetics April 05	15	38	60	42
Diabetics Oct 05	50	61	44	78
Non Diabetics Oct 05	17	55	57	61
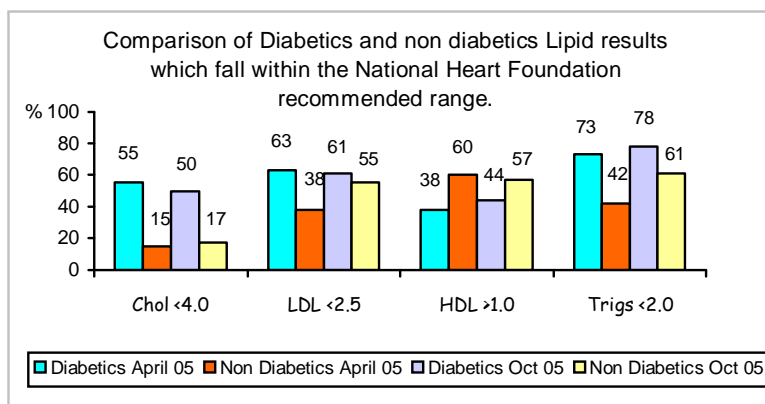
Haemoglobin

Haemoglobin (Hb) has been examined from the perspective of cardiovascular disease. The recommendations from the CARI guidelines suggest that patients with kidney disease *and cardiovascular impairment* maintain an Hb 110-120 g/L (Level 1 evidence). Risks associated with the higher Hb (>130 g/L) include increased risk of hypertension and increased mortality. CARI suggests an Hb concentration between 120-140 g/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 *110-130 g/L* for those with *no* cardiovascular disease and *110-120 g/L* for those *with* cardiovascular disease.

Haemoglobin results for patients with no known cardiovascular disease

	<110	110-130	>130
Mar-04	21	59	21
Sep-04	25	67	8
Apr-05	39	39	22
Oct-05	20	52	28

Haemoglobin results for patients with known or suspected cardiovascular disease

|	<110	110-120	>120	>130
Mar-04	21	21	58	42
Sep-04	18	27	55	36
Apr-05	24	29	48	43
Oct-05	29	18	53	24

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.

CAPD patients can be given oral iron with optimal absorption occurring if taken as a single dose at night without concomitant food or other medicines. Many patients cannot tolerate the side effects of taking Iron orally.

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.

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HbA1c (Glycosylated Haemoglobin)

Measuring the HbA1c gives us an idea of the average glucose level of the past 8-12 weeks.
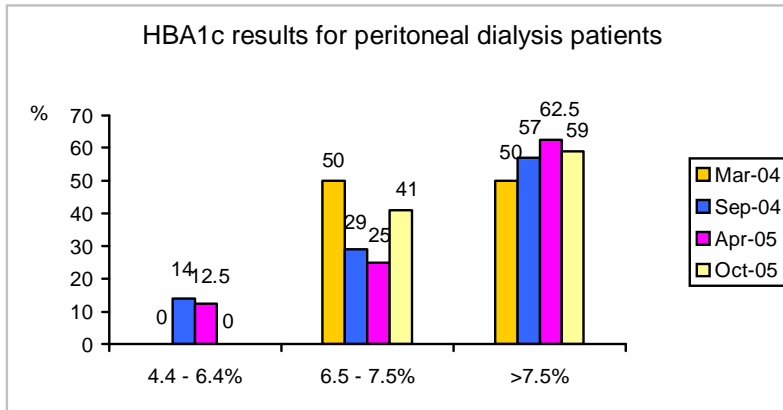
HbA1c statistics for October 2005:

Mean: 8.0
Standard deviation: 1.46
Minimum: 6.5
Maximum: 12.0

HBA1c results for peritoneal dialysis patients

(Chart: percentage of patients by HbA1c category for Mar-04, Sep-04, Apr-05, Oct-05)

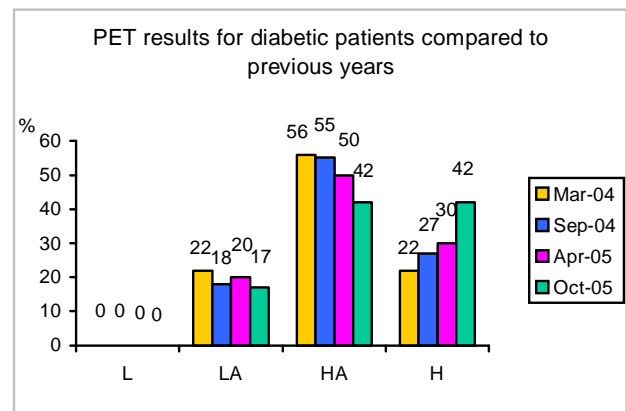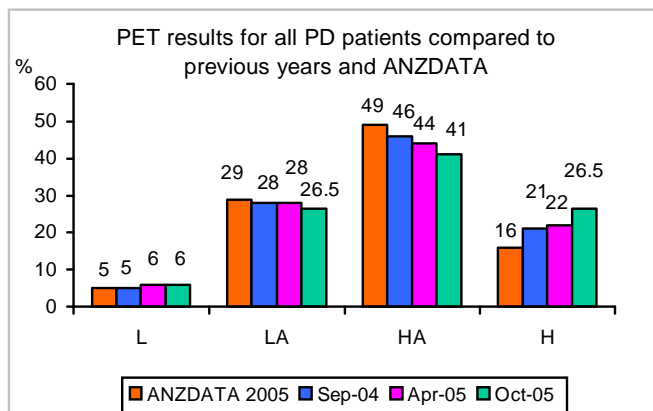| HbA1c range	Mar-04	Sep-04	Apr-05	Oct-05
4.4 - 6.4%	0	14	12.5	0
6.5 - 7.5%	50	29	25	41
>7.5%	50	57	62.5	59

PET (Peritoneal Equilibrium Test) Results

A PET is performed approximately 1 month after initiating peritoneal dialysis but no earlier than 2 weeks.

At present the unit protocol is to only perform 1 PET, but this may be adjusted to measure for changes, which can be a sign of sclerosing peritonitis in the long-term peritoneal dialysis patients. 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).

Of the 39 patients who have had a PET, 1 patient had a PET collected at a previous hospital, 5 are dated 2001 (13%), 7 dated 2002 (18%), 7 dated 2003 (18%), 8 dated 2004 (20%) and 11 dated 2005 (28%).

The results of the PET tests throughout the years are demonstrated below in the two graphs.
Of the patients included in the analysis, 1 has had a repeat PET over a 12-month period.

PET results for all PD patients compared to previous years and ANZDATA

Category	ANZDATA 2005	Sep-04	Apr-05	Oct-05
L	5	5	6	6
LA	29	28	28	26.5
HA	49	46	44	41
H	16	21	22	26.5

PET results for diabetic patients compared to previous years

Category	Mar-04	Sep-04	Apr-05	Oct-05
L	0	0	0	0
LA	22	18	20	17
HA	56	55	50	42
H	22	27	30	42

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.
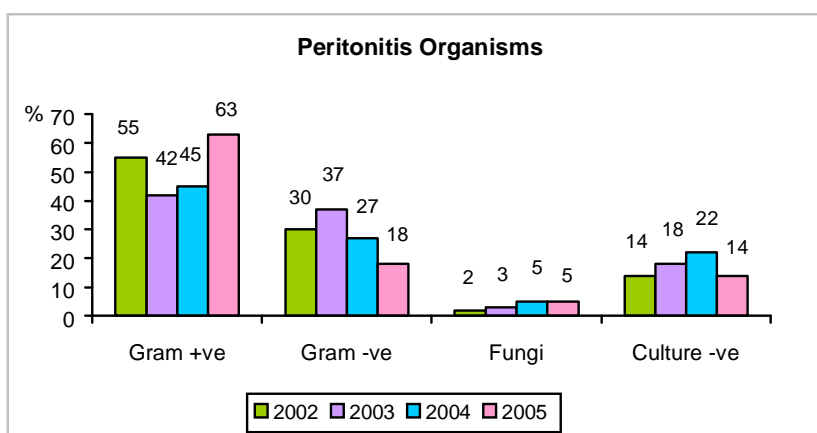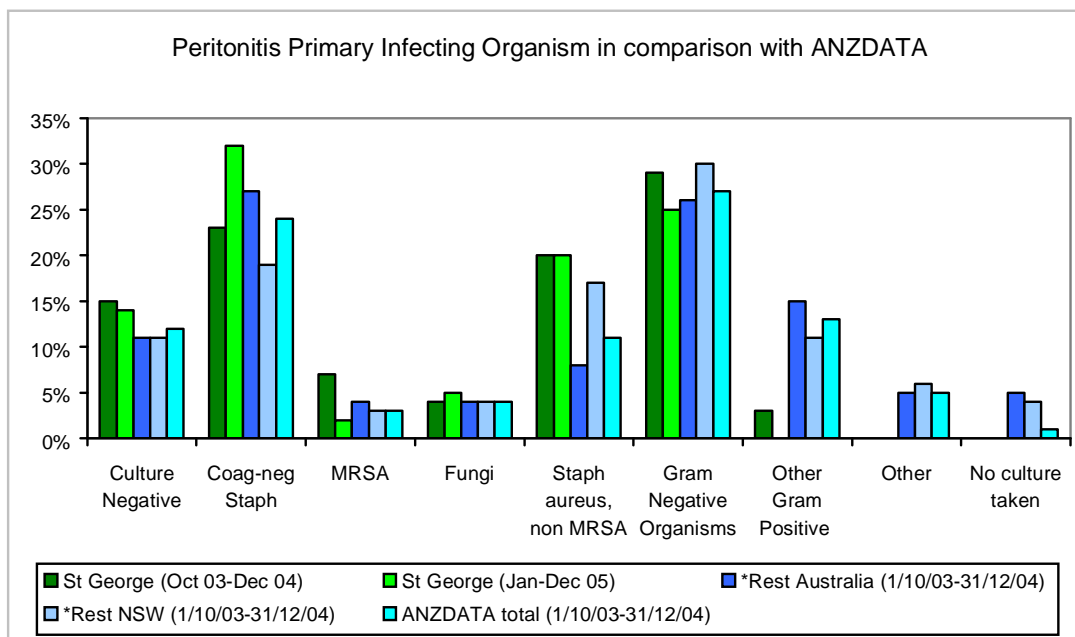Review the Poet 2.1 database for episodes.
Peritonitis Episode Forms (ANZDATA) are used to accurately enter data into an excel spreadsheet. This data is then analyzed using the statistical program SPSS vs13. The Peritonitis Episode Form lists the organism(s), Drug Treatments, Outcomes and Recurrence 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. Due to privacy rules, we are unable to compare between hospitals.

Outcomes

The table below outlines the data on peritoneal dialysis infection rates collected from 1998 to 2005.

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

Peritonitis Causative Organisms

Peritonitis Primary Infecting Organism in comparison with ANZDATA

Legend:
- St George (Oct 03-Dec 04)
- St George (Jan-Dec 05)
- *Rest Australia (1/10/03-31/12/04)
- *Rest NSW (1/10/03-31/12/04)
- ANZDATA total (1/10/03-31/12/04)
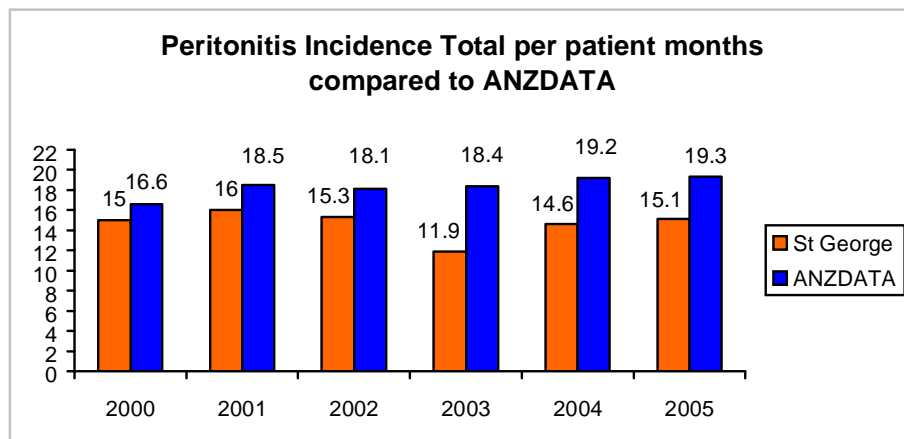

Peritonitis Organisms
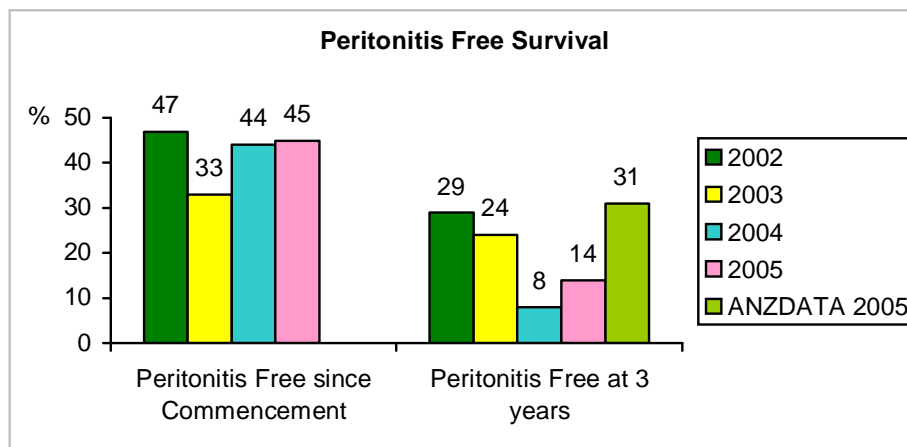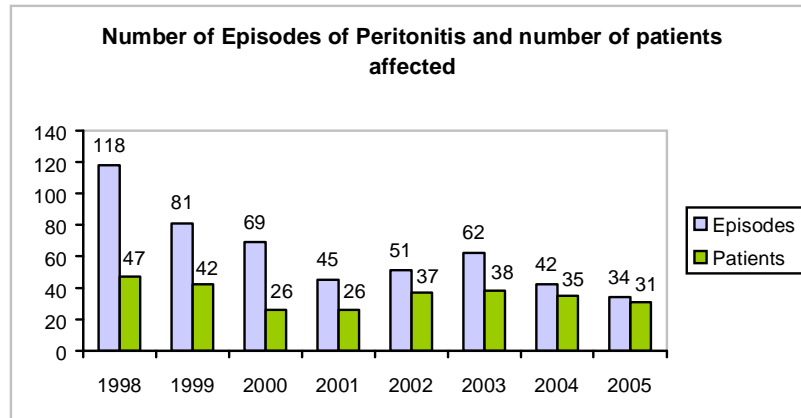
Legend: 2002, 2003, 2004, 2005

The results for 2005 have been obtained with data collected from the peritonitis episode forms (ANZDATA). 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 (2005).

Change of treatment as a result of peritonitis

The peritonitis data collected throughout 2005 was run through the SPSS 13 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	Percent
Interim Haemodialysis	9
Permanent Haemodialysis	11
Catheter removed	20

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Peritonitis graphs and tables comparing previous years and ANZDATA

Number of Episodes of Peritonitis and number of patients affected

Peritonitis Free Survival

Peritonitis Incidence Total per patient months compared to ANZDATA

Peritoneal Dialysis Patients Peritonitis free at 3 years

Year	St George	ANZDATA
2005	14%	31%
2004	8%	30%
2003	24%	30%
2002	29%	30%

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 improved in 2005 from 1/14.6 to 1/15.1.
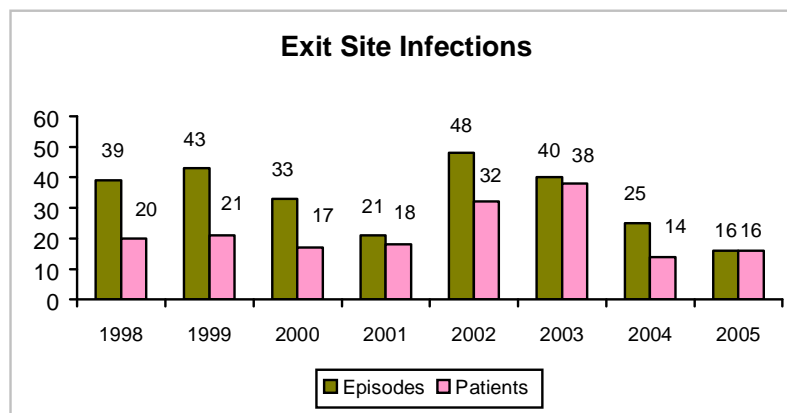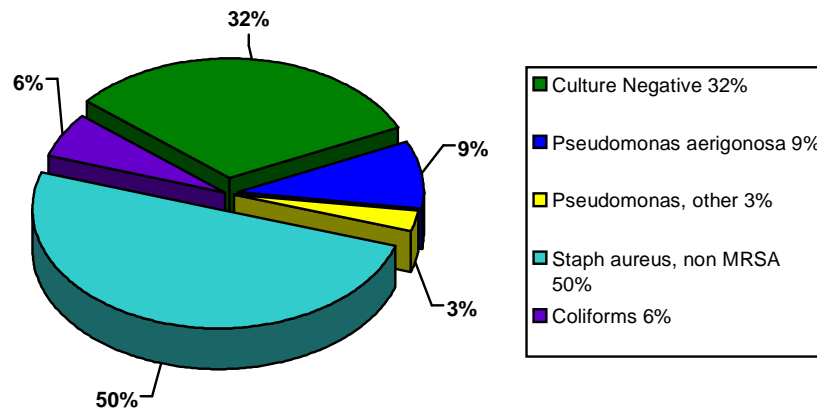
At present patients are averaging their first peritonitis episode at 15.1 months. The percentage of patients peritonitis free at 3 years has improved to 15% after the previous years dramatic fall to 8%. There was one case of sclerosing peritoneum diagnosed in 2005 in a patient who had been dialyzing for 4 years.

Comments

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. The patients' environment at home may play a role in the rate 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 2005 to December 2005.

- Culture Negative 32%
- Pseudomonas aerigonosa 9%
- Pseudomonas, other 3%
- Staph aureus, non MRSA 50%
- Coliforms 6%

Exit Site Infections

- ESI episode of 1/32 patient months compared to 1/24.5 patient months in 2004. This is a large improvement.
- 76% of the total number of peritoneal dialysis patients, were free from exit site infections in 2005 compared to 81% in 2004.

Benchmark: ANZDATA
ANZDATA does not collect data on Exit Site Infections; therefore there is no Australian benchmark data with which to compare.
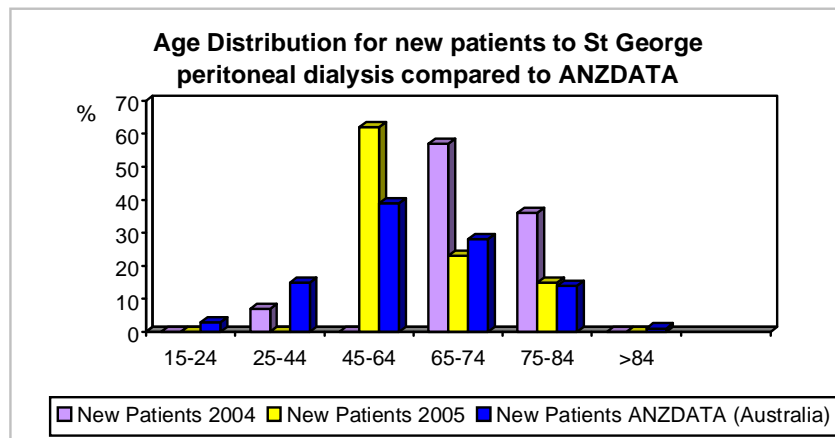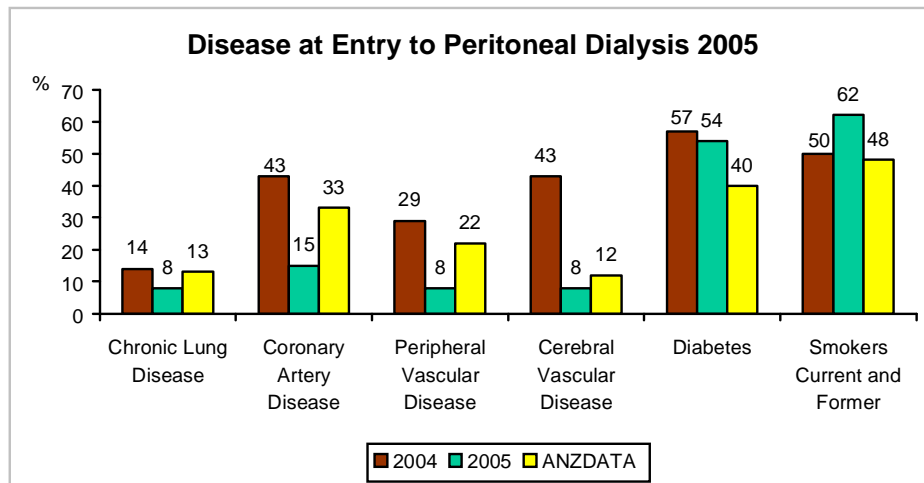
POET
The St George Peritoneal Dialysis Unit uses the Baxter POET computer software to record all swabs taken for analysis from each and every PD patient. The results of all of these swabs can then be graphed using this software. The drawback of this system is the inability to filter this data for actual exit site infections and routine swabs (including post operative). The filtering of the data has to happen manually using excel spreadsheets and SPSS v13 for analysis.
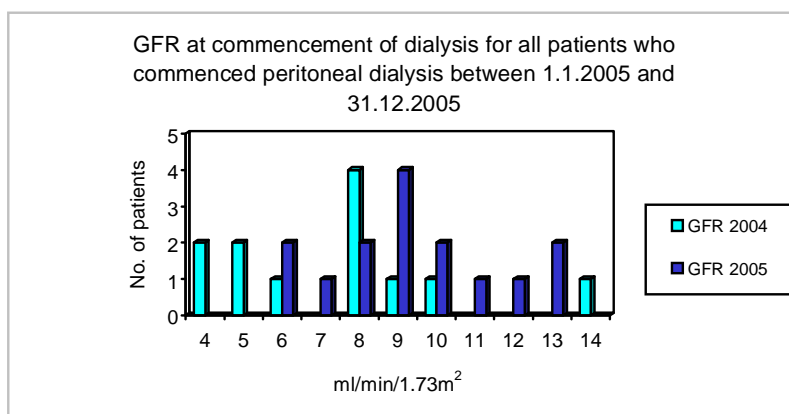
32

Acceptance onto Peritoneal Dialysis

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

- 2005 had two late referrals to peritoneal dialysis.
    - One transfer from overseas, one late diagnosis.
- Mean age at commencement of PD was 63 years.

Disease at Entry to Peritoneal Dialysis 2005

	2004	2005	ANZDATA
Chronic Lung Disease	14	8	13
Coronary Artery Disease	43	15	33
Peripheral Vascular Disease	29	8	22
Cerebral Vascular Disease	43	8	12
Diabetes	57	54	40
Smokers Current and Former	50	62	48

Age Distribution for new patients to St George peritoneal dialysis compared to ANZDATA

New Patients 2004 ☐ New Patients 2005 ☐ New Patients ANZDATA (Australia)

Compared to the previous year, we have accepted more patients between the ages of 45-64 in 2005 which corresponds to ANZDATA which has reported the only increases for the latest annual report are for the ages of 45-54 (12%increase) and for the >85 years group.

GFR at commencement of dialysis for all patients who commenced peritoneal dialysis between 1.1.2005 and 31.12.2005

ml/min/1.73m^2

GFR 2004 ☐ GFR 2005

4 out of the 15 new patients analyzed for this report had a GFR calculated at 9ml/min. 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.

Body Mass Index (BMI) for Peritoneal Dialysis Patients at commencement of Dialysis in 2005
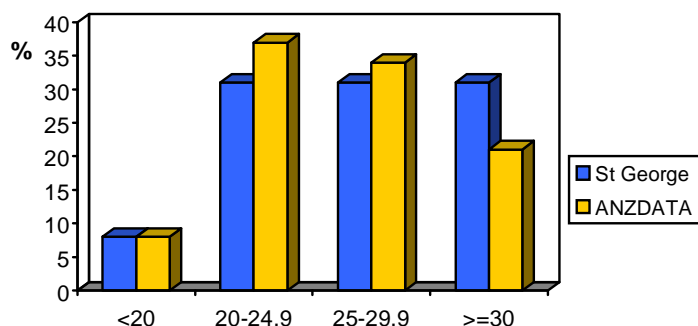
Higher BMI is associated with higher rates of technique failure and death in Australia and New Zealand. (ANZDATA Registry 2004 Report: Pg 60)

*BMI <20 indicates underweight, 26-30 overweight and >30 is obese.

Table: Breakdown of baseline Characteristics of Peritoneal Dialysis patients [1]

		St George Total 2005 (n=44)	ANZDATA
Racial Origin	Caucasoid	66%	70%
	Aboriginal/TSI	0%	5%
	Asian	11%	7%
	Maori/Pac Islander	14%	10%
	Indian	2%	3%
	Other	7%	5%
Gender	Male	61%	54%
	Female	39%	46%
Body Mass Index (kg/m)	<18.5	2%	3%
	18.5-24.9	39%	41%
	25-30	46%	34%
	>30	14%	22%
Co-morbidities	Smoking (Current and former)	50%	48%
	Chronic Lung Disease	10%	13%
	Cerebrovascular Disease	18%	12%
	Coronary Artery Disease	36%	33%
	Peripheral Vascular Disease	18%	22%
	Diabetes	43%	40%

The distribution of all Peritoneal Dialysis patients amongst the nephrologists at the end of 2005 can be seen in the table on the right.

Doctors	
Trew	29.5%
Chan	23%
Kelly	11%
Brown	20.5%
Mangos	16%

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[1] Adapted from: ANZDATA (2005) Anzdata Report. (Excludes 0-14 year olds) [Online] Available: http://www.anzdata.org.au/ANZDATA/AnzdataReport/28thReport/files/Ch06PeritonealDialysis.pdf (page 95)

Renal Biopsy Audit

Background
Renal biopsy enables histological examination of renal tissue from which a diagnosis may be made and a prognosis given of renal disease. Renal biopsy is also used routinely post-renal transplant. The audit covers the period 30[th] May 2004 until 20[th] October 2005.

Measured outcomes included:
- Patient characteristics
- Renal biopsy adequacy
- Complications

How did we record, store and analyze the data?
Dr Mangos and the Registrars prospectively collected a renal biopsy database.
A full list of all renal biopsies was obtained from histopathology and biopsies performed under ultrasound or CT scan entered into an Excel database.
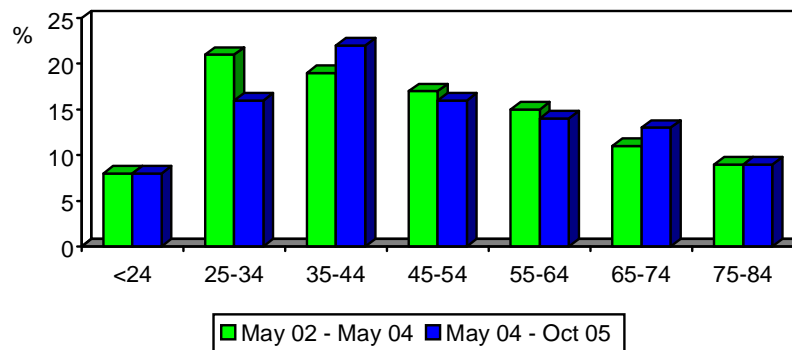Data on the biopsies was collected from medical records and diagnostics.

Activity
A total of 112 biopsies were performed between May 2004 and Oct 2005

Primary Care Physician for patients having a renal biopsy
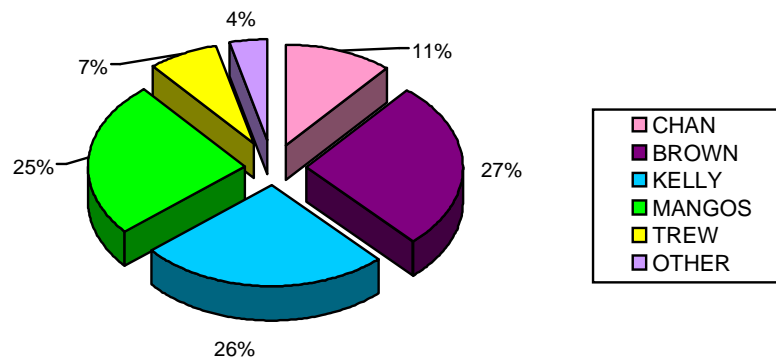
**Age at Biopsy** (May 04-Oct 05: mean 47.98, std dev 17.29)

Adequacy (Table 1)

Test	Adequate	Marginal	Inadequate	Unknown	Not Attended
Light Microscopy	92%	5%	3%	2%	
Immuno-Fluorescence	87%	5%	7%	2%	
Electron Microscopy	88%	4%	4%	2%	3%

Biopsy Statistics (Table 2)

	Age of patients	Number of Passes	Number of cores
Mean	47.98	2.54	2.51
Standard deviation	17.29	1.08	1.16
Minimum	14	1	1
Maximum	81	5	6

Complication Rates of renal biopsy for the period of May 04 - Oct 05
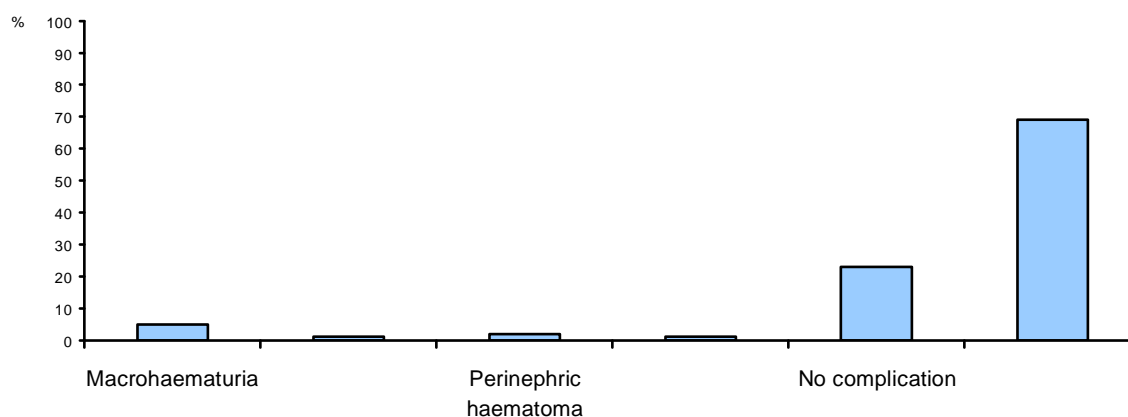
Outcomes
- The largest age group undergoing renal biopsy is the 35-44 yr group
- Adequacy of core collection was excellent

Recommendations

Due to the inability to collect data in a manner that provides any great amount of information, Dr Mangos and the registrars will take over the collection of the data to report all biopsies prospectively instead of retrospectively as has been done in the past.

CKD Clinic Report

Aim

To provide data to the department that shows how the St George Hospital Chronic Kidney Disease (CKD) Clinic is performing when compared to past statistics.
To ensure all medical staff are aware of the clinic and its importance in the decision-making processes of patients with ESRF and their families.

Process

Shelley Tranter (Renal CNC) coordinates the clinic which is conducted on 4 west. The dietitian, pharmacist and social worker assess and educate in these clinics.
Shelley collects all of the data representing the clinic, which is used by the renal QA nurse for presentation to the renal meeting and preparation for the annual report.
There is no benchmark data to compare the results, only previous clinic data dating back to April 2002.

Current Status

From January to December 2005, there were 32 new attendees to the CKD clinic; 23 males, 9 females. These were further broken down to the consultants; Brown 9, Chan 4, Kelly 5, Mangos 1, and Trew 13.
Follow up appointments are important for supporting patients at different stages of their trajectory to dialysis. There were 14 return visits to the clinic for 2005.
A peritoneal dialysis pathway was introduced in 2005. Patients who are having catheter insertion in the short term are commenced on the pathway. This ensures adequate preparation for surgery and includes screening for nasal staph carriage.
Of the 32 patients seen this year; 26 remain active on the CKD books, 2 are not for dialysis, 2 commenced peritoneal dialysis and 2 commenced hospital haemodialysis. The mean age for 2005 is 60.65 years.
Of the twenty known ESRF patients who commenced haemodialysis this year (excludes those who commenced haemodialysis due to acute episodes or late referrals), only 5 had attended the CKD clinic pre dialysis. Only one of the nine 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 represents the number of new attendees each year. A total of 147 patients have been seen since the commencement of clinics in April 2002. There has been a reduction in the number of new patients seen in the past two years. This is due to a number of reasons including a number of clients referred but not making appointments, an increase in the number of patients having palliative management, and new patient education and assessments being up to date.
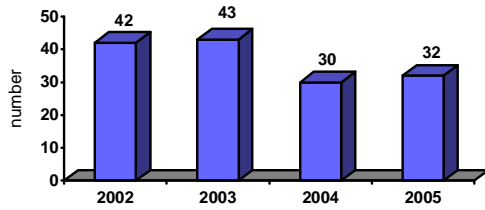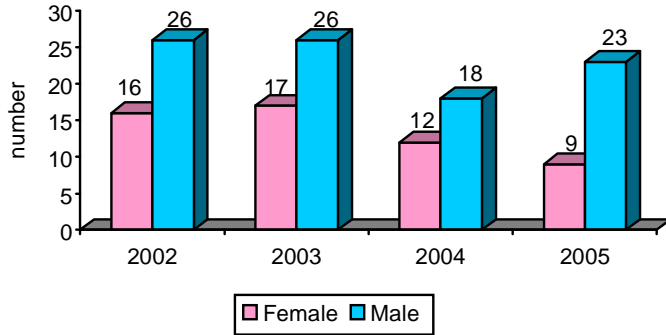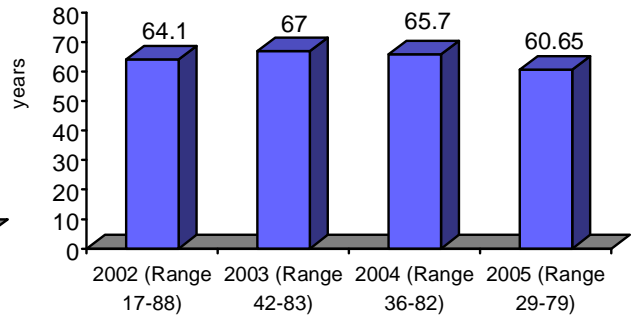
CKD New Attendees

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

Figure 3
The ages of the CKD clientele since its introduction in 2002 vary from 17 to 88 years of age. 2005 has a younger group of new referrals ranging from 29 to 70 years. The mean ages are represented above each bar; 2005 shows the younger age group with a mean age of 60.65 years.

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 4   Attendance by Physician
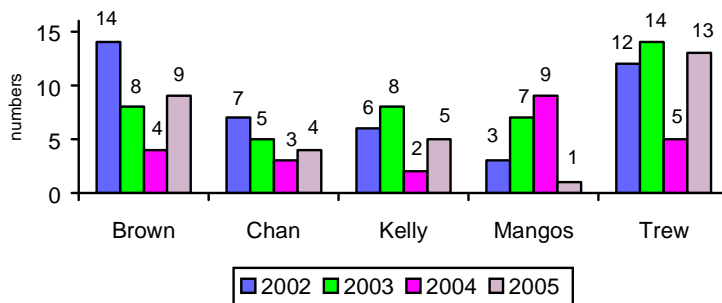
Importance of the outcomes to the unit

Evidence is available regarding late referral of dialysis patients, this evidence shows that those who are referred late (< 3 months before dialysis) have much greater chance of ending up on haemodialysis and having a central venous line[2]. 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 Journal reinforces the benefits of what we already offer to our CKD patients through the clinic and has recommendations based on level III and IV evidence. What does this mean? 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, medication review and social work. Clients are referred to the clinic by the nephrologists, but the ward doctors should also refer any CKD client whom they feel may benefit from the service.

2. There is no good mechanism in place at present for early referral of patients for dialysis access. The QA nurse and the nephrologists are currently evaluating this population of clients.

3. 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 clinics 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.

4. Patients are often lost for follow up 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.

5. More prospective dialysis patients need to be referred to the clinic to improve the numbers of patients who commence haemodialysis with no previous CKD clinic contact. Again, it is the doctors' responsibility to refer and encourage the patients to attend.

Review

The updated CKD clinic data will be presentation to the renal unit again in late 2006 by Shelley Tranter CNC.

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[2] ANZDATA 27th annual report

SGH Renal Unit Transplantation Report
Assoc Prof John Kelly

Nine renal transplants were performed in the 2005 calendar year, with 8 procedures being deceased donor grafts and 1 procedure being a living related graft. All of these procedures have resulted in a successful functioning transplant. In the 12 years of the transplant programme to the end of 2005, 111 transplants have been undertaken at St George Hospital. Results for the SGH transplantation programme are comparable to the national average with a 12 month patient survival of 98% and 12 month graft survival of 93%. 55% of patients transplanted still have functioning grafts at 10 years following their transplant. Laparoscopic donor nephrectomy was introduced into the programme in 2002 and this procedure is offered to all prospective donors at SGH.

The transplant waiting list continues to increase in parallel with increased dialysis activity in the unit. During 2005, the transplant waiting list peaked at 50 patients. All patients on the waiting list undergo a formal, centralised, annual review of their suitability for transplantation in the transplant clinic. The transplant clinic also provides facilities for independent assessment of potential live donors. Assessment of 10 potential live renal donors was commenced in 2005. All transplanted patients are reviewed for the first 3 months in the transplant clinic, at which time ongoing management is continued by the patients' original renal physician. In 2005 a programme of annual formal review of long-term transplant recipients in the transplant clinic was introduced.

Associate Professor John Kelly has coordinated the renal transplant programme at SGH for the last 10 years. In the last 12 months additional consultant nephrologist support has been provided by Dr Cathie Lane and Dr Jane Holt. Advanced trainees in nephrology are actively involved in transplant clinics, which provide invaluable clinical experience and training in pre-operative patient assessment and post-operative acute and chronic patient management. Surgical support for the transplantation programme during 2005 was provided by Dr Ray Englund, Peter Aslan, David Malouf, Peter Nash and Andrew Lennox. Dr Englund has provided surgical support for the transplant programme at SGH since its inception in 1993. Dr Peter Aslan has extensive experience in laparoscopic urological surgery and provides laparoscopic donor nephrectomy services for the SGH transplant programme.

An active quality assurance programme assessing all aspects of the transplantation service is conducted within the renal unit and externally by means of participation in the ANZDATA programme. Local policy and procedures are reviewed regularly and updated on the renal unit intranet site. The programme also supports clinical research activity. In 2005, a research programme addressing cardiovascular outcomes in the transplant population was established in collaboration with the cardiology department at SGH.

RENAL NUTRITION

Ongoing QI activities performed by the renal dietitians in year 2005 included:

- A. Dialysis nutrition assessment and dialysis adequacy
- B. Nutritional status at commencement of dialysis
- C. Chronic Kidney Disease (CKD) clinic evaluation – Nutrition component
- D. CKD clinic and nutrition at commencement of dialysis

The aims of these QI activities are to improve patient outcomes and to formulate management strategies

A. Dialysis, nutrition and dialysis adequacy:

Background: Dialysis patients of SGH receive regular nutritional assessment by dietitians using criteria as recommended by the CARI and DOQI guidelines. Nutrition intervention and monitoring will be provided once suboptimal control and / or undesirable parameters are identified.

Routine assessments are performed twice per year (e.g. in February and November) coinciding with the unit's dialysis adequacy studies and audit of biochemical and haematological targets by the unit's QI officer – see separate reports

Aim: To compare audit results to CARI and DOQI guidelines and the recommended best practice in the literature

Remark: These activities have become routine care of patients in the SGH dialysis unit for more than 6 years, selected results are presented in this report.

Results:

Audit Period	2/05	11/05
No of patients audited	131	122
SGA (A:B:C %)	72:26:2	77:21:2
% Alb >33g/L	69.5	67.2

Remark: ~ 5% of these patients were inpatient during the audit period.

Comment:
- On average ~75 % of patients were identified as well nourished using the SGA criteria (SGA score A). However some of these patients are overweight that require weight management

Future Plan:
- To continue current management and audit.
- To report of longitudinal changes and progress

B Nutritional Status at Commencement of Dialysis and survival:

Background: Nutritional parameters at the start of dialysis predict morbidity and mortality

Aim: to audit clinical characteristics and survival rate of patients who commenced dialysis at the SGH renal unit from 8/2000.

Subjects:
Inclusion: Only patients with progressive ESRF and commenced dialysis at the STG were included for analysis.

Exclusion: ARF, A/CRF, ex-Transplant, early start for transplant, transfer from other units or SDC

Patient characteristics:

Period: patients commenced dialysis (HD and PD) in 8/2000 – 12/2004

Number: 150 (total no of patients commenced long term dialysis ~250)

M: F (%) = 60.7:39.3

Age: 66.1±13.7yr (17.8 - 90.1)

GRF: 8.1± 2.8 ml/min/1.73m^2 (3.4-23.5)

SGA	A Well nourished (n=66)	B Mildly-moderately malnourished (n=65)	C Severely malnourished (n=19)
Age (yr)	61.8 ± 13.6	68.6 ± 12.4	72.1 ±14.6 *(B-C NS)*
BMI (kg/m^2)	29.0 ± 5.8	24.1 ± 3.0	18.1 ± 2.4
GFR (ml/min/1.73m^2)	9.1 ± 3.1	7.5 ± 2.4	6.7 ± 1.7
Alb (g/L)	32.9 ± 4.1	30.7 ± 4.9	26.2 ± 5.0

Comments: Well nourished patients (SGA =A) were younger, had higher BMI and serum albumin at commencement of dialysis.

Addition audit:

% survival of the 3 SGA patient categories one year after commencement of dialysis is plotted in graph 1.

Graph 1: SGA at commencement of dialysis and **ONE** year survival (%):
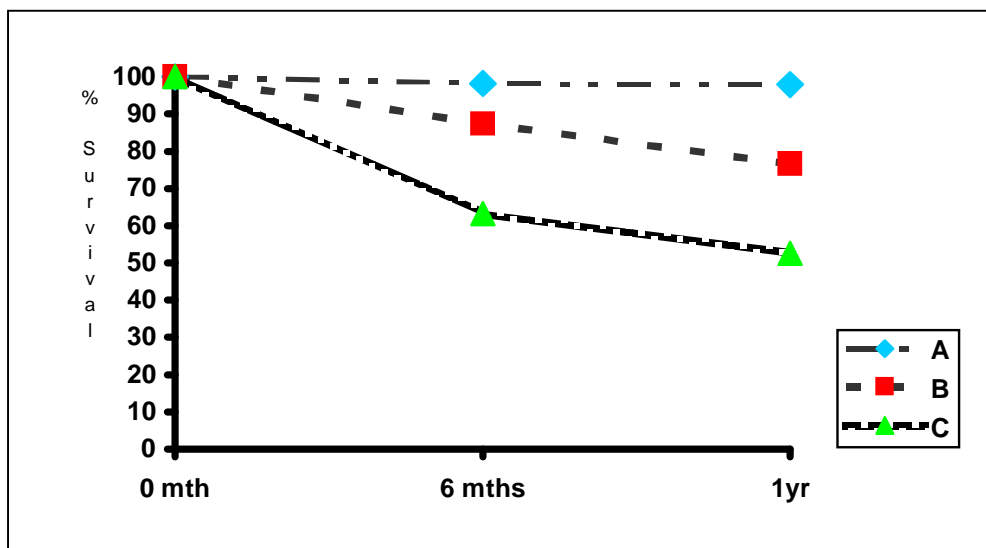
Characteristics of survivors Vs non- survivors:

	Survivor (n=123)	Non-survivors (n=26)	*p*
Age (yr)	64.8 ± 14.3	72.1 ± 8.8	0.014
BMI (kg/m^2)	26.1 ± 5.6	22.4 ± 5.3	0.002
GFR (ml/min/1.73m^2)	8.2 ± 2.6	7.8 ± 3.6	0.491
Alb (g/L)	31.8 ± 4.7	27.9 ± 5.1	0.001
SGA A:B:C (%)	52:40:8	8:58:35	0.000

Comment:
- Survivors were younger, had significantly higher BMI, albumin and SGA score, where as GFR showed no significant difference.
- These are preliminary data only. Effect of other factors and confounders on survival will be examined. Further statistical analysis is required to draw meaningful interpretation.

Summary:
- Better survival was observed in well nourished patients at commencement of dialysis

Plan:
- To provide pre-dialysis nutrition intervention as per clinical guidelines to optimize the nutritional status of CKD patients prior to commencement of dialysis.
- To continue data collection and to seek help from statistician for data analysis

C CKD clinic evaluation– Nutrition component

Background: The establishment of a multidisciplinary CKD assessment clinic in 4/2002 provided dietitian the opportunity to assess patients' nutritional status pre dialysis - see previous reports

- The first audit: April 2002 to October 2002
- The 2nd audit: October 2002 to October 2003
- The 3rd audit: April 2002 to December 2004
- Current audit: April 2002 to December 2005

Low physician referral rate for nutrition intervention (41.2%) was observed prior to and in the first stage of audit. Since then " blanket referral" for nutrition intervention was established in the clinic evaluation meeting (11-02) with protocols agreed by all renal physicians

Aim: Evaluation of CKD assessment clinic – nutrition component for the period of 4/2002 to 12/2005

Method: To describe demographic, clinical and nutritional characteristics of patients attended the CKD assessment clinic.

Results:
Cumulative data from 4/2002 to 12/2005:

Total no pf patient	136
Gender M:F	90:46 (66.2%:33.8%)
Age (yr)	65.5 ± 13.3 (17.7-88.1)
GFR (ml/min/1.73m^2)	15.6 ± 5.7 (4.0- 41.6)
Diabetic (%)	34.4
SGA A:B:C (%)	56.5: 34.8: 5.1
Stage of CKD 3:4:5 (%)	2.3: 51.5: 46.2

Comparison of clinical characteristics, referral and intervention rate over 4 audit periods :

Period of Audit	4/02 to 10/02 (1st audit)	10/02 to 10/03 (2nd audit)	11/03 to 12/04 (3rd audit)	1-12/05 (4th Audit)
		Blanket referral		
Total no of patients	41	36	34	25
GFR (ml/min /1.73m^2)	13.2 ± 5.3 (7.8-30.0)	15.4 ± 5.7 (4.8-28.9)	17.0 ± 5.8 (6.6-41.6)	17.6 ± 5.3 (4.0-29.6)
SGA (A:B:C%)	47:42:11	43:52:5	79:18:3	74:26:0
MO referral (before, at and after the clinic)	17/41	15/36	15/34	9/25
Screened and wait for MO referral	11/41	0/36	0/34	0/25
Dietitian initiated intervention	4/41	21/36	16/34	12/25
Total no. of pts received intervention (intended)	21/41	36/36	31/34	21/25

Comment:
- Intervention rate (intended) increased since 10/2002.
- Earlier referral (GFR) by physician was observed, e.g. 13.2 ± 5.3 and 17.6 ± 5.3 ml/min/1.73m^2 in 2002 and 2005 respectively
- Gradually, higher proportion of patients attending the clinic had SGA score A, ie better nourished with little symptoms and had lesser problem with nutritional intake.

Summary:
- A high prevalence of malnutrition was observed (26-56%)
- The CKD clinic continues to be useful for identifying the need for nutritional interventions.
- The clinic is sustainable

Future Plan:
- To continue current audit
- To audit outcome of nutrition intervention

D CKD Clinic and Clinical/Nutritional Characteristics of patients at commencement of dialysis

Aim: preliminary audit of the clinical /nutritional characteristics of new dialysis patients (HD+PD) with **progressive ESRF**, at various time periods before and after commencement of CKD Assessment Clinic in April 2002.

Results:

Period	8/00-3/02*	CKD Assessment clinic			
		1st yr (4/02-3/03)	2nd yr (4/03-3/04)	3rd yr (4/04-3/05)	4/05-12/05
Total no of pt	66	44	31	14	12
No pf patient attended the CKD Clinic	0/66*	17/44	16/31	9/14	8/12
Age (yr)	64.3±13.6 (28.6-90.1)	69.0±15.2 (17.8-88.5)	65.8±11.9 (40.8-84)	63.3±11.2 (41.8-79.7)	63.3±13.8 (32.9-77.7)
BMI (kg/m^2)	25.4±5.9 (14.5-41.9)	25.2±5.8 (15.6-39.1)	25.8±4.3 (16.6-40.1)	27.8 ±8.3 (17.6-46.3)	28.5±5.8 (20.0-37.1)
GFR (ml/min/1.73m^2)	7.5±2.2 (3.4-12.8)	8.3±2.8 (4.4-14.9)	9.2±3.6 (4.7-22.5)	8.1±2.8 (3.6-14.2)	9.2±3.1 (4.9-16.2)
Alb (g/L)	31.1±4.9 (16-42)	30.8±4.6 (21-42)	31.6±5.8 (16-43)	31.4±4.1 (26-38)	32.8±5.4 (25-42)
% >33g/L	45.5	40.9	45.2	50.0	50.0
SGA A:B:C (%)	40:39:17	34:50:16	55:42:3	64:36:0	58:34:8

* patients might have received input from various team members (CNC, dietitian, social worker or pharmacist) prior to commencing dialysis

Results (cont'd):

Also see
- Graph 2: Audit of SGA and Albumin of new dialysis patients (with progressive ESRF) in relation to the establishment of the CKD clinic in 4/2002
- Graph 3: Audit of SGA of HD patients – data extracted from 6 monthly routine nutrition audits
- Graph 4: Audit of serum albumin and HD patients - data extracted from 6 monthly routine nutrition audits

Comments:

- Since the establishment of the CKD assessment clinic in 4/2002, 40-60% of new dialysis patients (with progressive ESRF) had attended CKD assessment clinic. New dialysis patients (with progressive ESRF) accounted for ~60% of patients commenced long - term dialysis at the SGH
- It appears there is a trend of better nutritional status among the new dialysis patients, e.g. SGA score, Albumin

Remarks: It is difficult to draw conclusion of the effect of CKD assessment clinic on nutrition until the following parameters are examined:

- Initial nutrition state at time of clinic assessment, type and duration of intervention provided
- Intake of new patients – type, selection
- Discharge of patients – death, transfer (especially to interpret graph 3-4)
- Effect of increase in dietitian staffing level from 1.0 to 1.5 FTE in January 2003

Future Plan:

- To continue current audit
- To examine individual patients' progress between CKD assessment clinic and initiation of dialysis.

Reported by
Maria Chan

Graph 2: Audit of SGA and Albumin of patients (with progressive ESRF) at commencement of dialysis in relation to the establishment of the CKD clinic in 4/2002
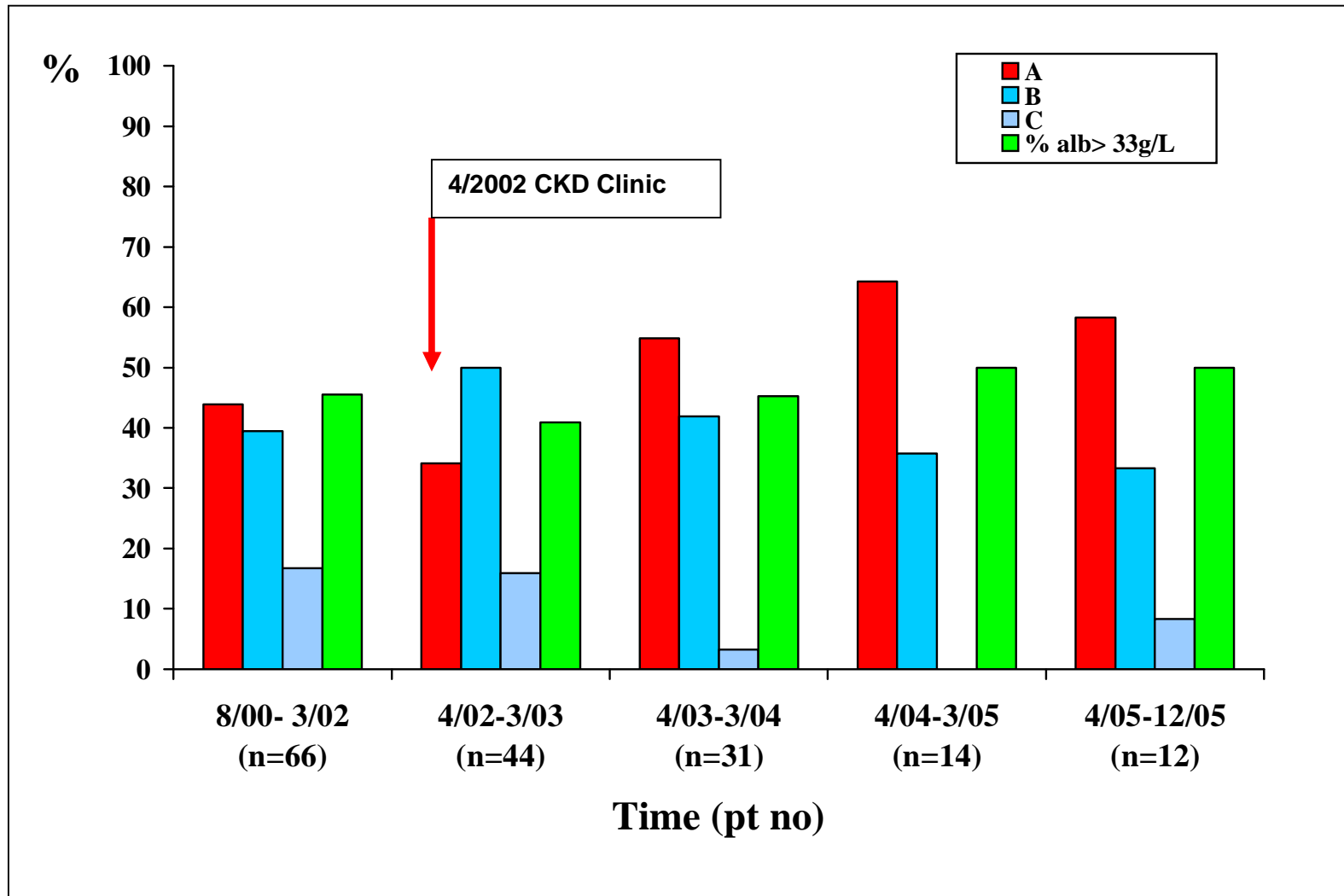
Graph 3: Audit of SGA of HD patients – data extracted from 6 monthly routine nutrition audits
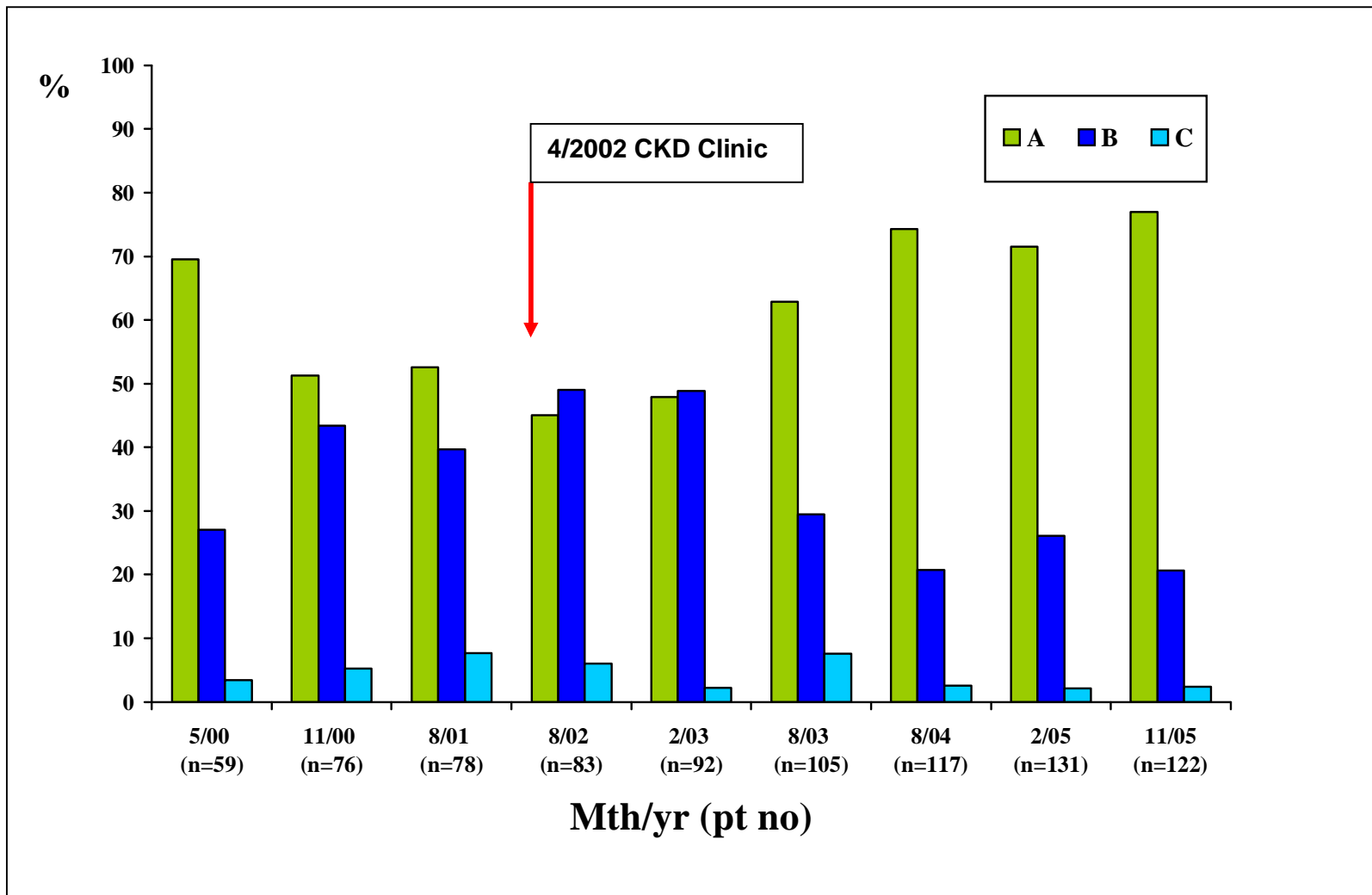
Graph 4: Audit of Serum Albumin and HD patients - data extracted from 6 monthly routine nutrition audits
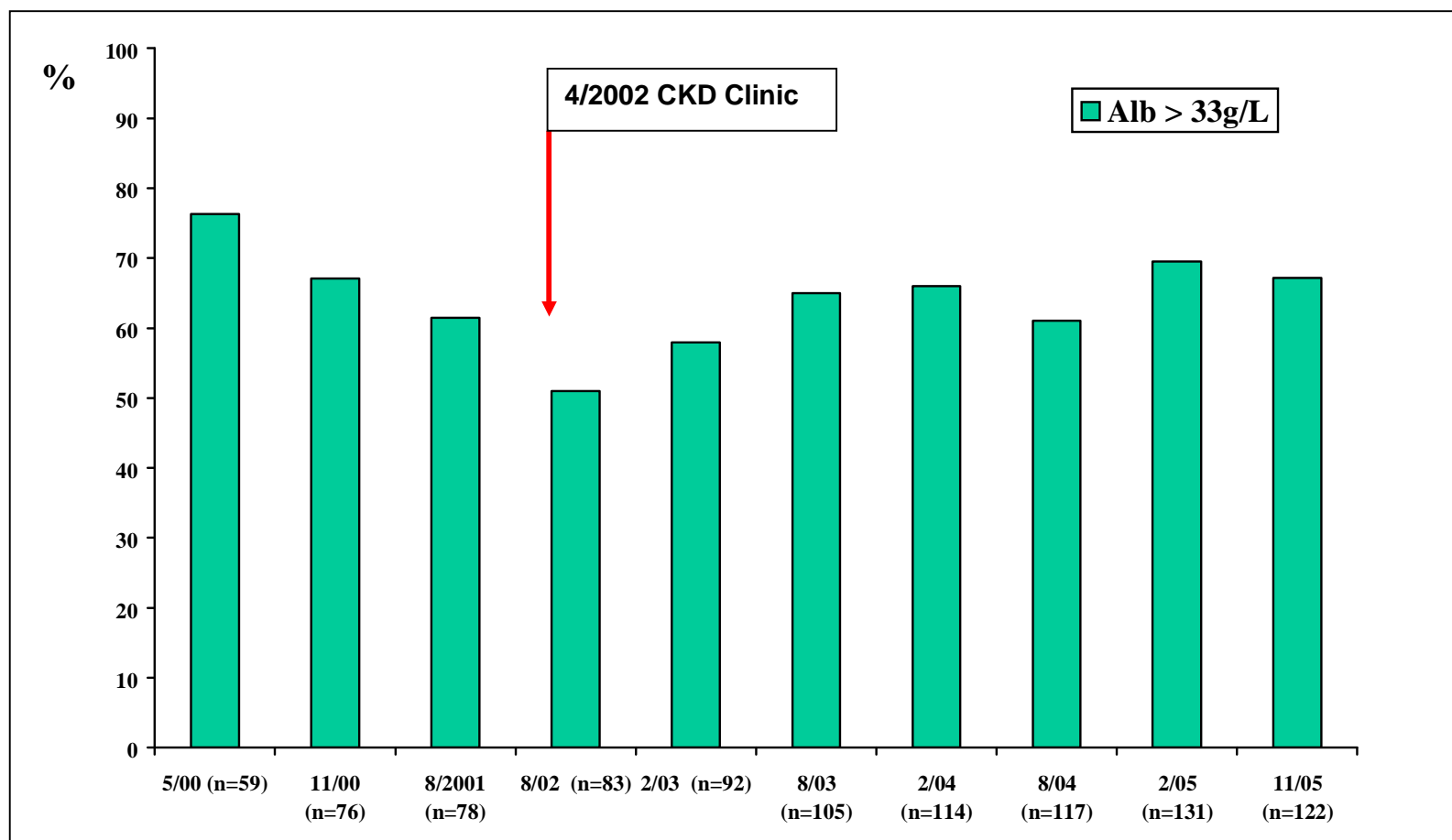
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