KIDNEY DIALYSIS FOUNDATION

MEDICAL ANNUAL REPORT

2013

Prepared by

Dr Choong Hui Lin
Medical Director

Dr Grace Lee
Med Director (PD)

With input from:

Lay Kwee Chin
Senior Nurse Clinician, Patient Services

Theresa Soh
Clinical Coordinator, Patient Services

Florence Fan
PD Nurse Clinician

TABLE OF CONTENTS

TABLE OF CONTENTS

1. INTRODUCTION

The Kidney Dialysis Foundation started operations in 1996 with only one hemodialysis centre at Alexandra Hospital. This was a centre originally managed jointly by the Renal Department at the SGH providing medical cover and nursing staff from Alexandra Hospital under the Ministry of Health (MOH). On 17 April 96 this center was taken over from MOH. The second hemodialysis centre at Bishan commenced operations in November 1997 with 43 patients transferred from the former Tan Tock Seng Dialysis Centre. A third hemodialysis centre called the San Wang Wu Ti - KDF Centre started operations on 1 Sept 03. A peritoneal dialysis centre built to support peritoneal dialysis services started operations on 1 Jul 03.

The centre at AH stopped operations in April 2005 when the lease expired. KDF's 4th hemodialysis centre started operations in Ghim Moh on 16 July 2007. The Peritoneal Dialysis Centre also shifted from Kreta Ayer to Ghim Moh.

Service Providers for the centres have been as follows:

	AH	BS	KA	GM
1996	ARC			
1997	ARC	ARC		
1998	ARC	ARC		
1999	ARC	ARC		
2000	ARC	ARC		
2001	FMC	ARC		
2002	FMC	ARC		
2003	FMC	ARC	FMC	
2004	FMC	ARC	FMC	
2005	FMC	ARC	FMC	
2006		ARC	FMC	
2007		ARC	FMC	ARC
2008		ARC	FMC	ARC
2009		ARC	FMC	ARC
2010		ARC	FMC	ARC
2011		DV *	FMC	ARC
2012		DV	FMC	DV *
2013		DV	FMC *	DV
2014		DV	FMC	DV

.

Legend: ARC = AsiaRenalCare
FMC = Fresenius Medicare
* Contract renewed

Dialysis medical care is currently provided by a team of practicing nephrologists from SGH, NUH, TTSH, KTPH and the private sector.

Ms Lay Kwee Chin (Senior Nurse Clinician, Patient Services) together with Ms Theresa Soh and Ms Sunitha d/o Silvanathan (Clinical Nurse) headed the paramedical team comprising Nursing, Patient Welfare and Dietetic Services.

This report covers medical data collated at the end of 2013.

2. THE DIALYSIS CENTRES

The location and prevalent number of patients as of 31 Dec 2013 are listed below:

	Centre	Location
1	KDF-Bishan Centre	Block 197, Bishan Street 13 #01-575/583
2	San Wang Wu Ti – KDF Centre	Block 333, Kreta Ayer Road #03-33
3	KDF – Ghim Moh Centre	Blk 6 Ghim Moh Road #01-188
4	KDF Peritoneal Dialysis	Blk 6 Ghim Moh Road #01-188

Dialysis Stations and Patient number

	Centre	No. of Regular + Isolation Stations	Total stations	Patient No
1	KDF-Bishan Centre	19 + 1 isolation	20	102
2	San Wang Wu Ti – KDF Centre	15 +1 isolation	16	82
3	KDF – Ghim Moh Centre	19 +1 isolation	20	84
4	Peritoneal Dialysis Centre	Not applicable	Nil	38

All haemodialysis centres operate 3 shifts a day.

HAEMODIALYSIS PROGRAMME

2013

3. EXECUTIVE SUMMARY (HD)

The Kidney Dialysis Foundation runs 3 haemodialysis centres at Bishan from 1997, Kreta Ayer Road – San Wang Wu Ti centre from Sep 2003 and Ghim Moh July 2007.

Two dialysis providers, Fresenius Medical Care and DaVita Renal, have been contracted to provide dialysis care. Medical care is provided by private sector as well as public sector nephrologists. Majority of the patients originate from SGH. In 2013, there were 61 new entrants.

Twenty-eight (28) patients exited the programme (2 transplant, 18 deaths, 3 transfers to PD programme, 2 to non-PD programmes, 3 withdrew from dialysis). In the prevalent population, average age was 58.7 $\pm$ 10.5 years, the number of patients with chronic glomerulonephritis as the etiology of renal failure was 36.2%, diabetic nephropathy 36.6%.

Almost all patients (99%) are using high flux dialysers. Average blood flow was 270 $\pm$ 34 ml/min. 86.6% of patients dialyse 4 hours or more. 75.7% of patients use a native arteriovenous fistula. Dialysis adequacy as measured by single pool KT/V is >1.2 in 96% of patients.

Mean hemoglobin was 10.9 $\pm$ 1.48g/dl. About 91% of all patients are on EPO. About 14.6 % of patients are considered Fe deficient.

There has been significant improvement in S Albumin of with only 54% of patients having Albumin<40 g/l compared with 95.7% the previous year. Hyperparathyroidism and hyper-phosphatemia remains a problem. Less patients are on intravenous Vitamin D.

Diabetes as a comorbidity was present in 39% of the population. 78% were on treatment for hypertension.

There was no significant changes in virology status. Hep B positivity was 6.0%, HCV 7.1%, HepB and HCV 0.7 %.

Less patients were registered on the National Transplant waiting list (10.4%), likely due to more patients having comorbidities in an aging population.

I. HAEMODIALYSIS PROGRAMME

4 STAFFING

MEDICAL

The medical staff comprised a pool of 14 nephrologists from both the restructured hospitals as well as the private sector. They are rostered to do rounds in the centre as well as screen new patients for medical suitability for entry into the dialysis programme if there has been no assessment performed at the restructured hospitals. Routinely, dialysis patients are seen once every month.

The nephrologists include:

1. Dr Stephen Chew
2. A/Prof Lina Choong
3. Dr Marjorie Foo
4. Dr Ho Chee Khun
5. Dr Titus Lau
6. Dr Grace Lee
7. Dr Pwee Hock Swee
8. Dr Tan Han Khim
9. Dr Tan Seng Hoe
10. Dr Yeoh Lee Ying
11. Dr Ng Tsun Gun
12. Dr Adrian Liew
13. Dr Jason Choo
14. Dr Roger Tan - stepped down in April 2013

Urgent medical cover was arranged as follows:

Bishan Centre:

1. Dr Goh Ming Kiong – Lifeline Medical Group
2. Dr Woo Kim Fatt – Agape Clinic

Kreta Ayer Centre:

1. Dr Chua Thiam Eng – Cambridge Clinic
2. Dr Lai Li Cheng – Chinatown Clinic
3. Dr Chong Foong Chong – Grace Clinic

Ghim Moh Centre:

1. Mobile doctor – 24hrs hotline: 62500625
2. Dr Lim Chin Wei – Family Clinic

NURSING

The overall standard of nursing is overseen by Ms Lay Kwee Chin, Senior Nurse Clinician, Ms Theresa Soh, Clinical Coordinator and Ms Sunitha Silvanathan, Clinical Nurse.

Routine audits are performed on the service provider to maintain standards.

The Dialysis Providers are:

- Fresenius Medicare at San Wang Wu Ti (Kreta Ayer) Centre (contract is renewed in Aug 2013 to Jul 2018)
- DaVita Renal at Bishan Centre (contract from June 2011 to May 2016)
- DaVita Renal at Ghim Moh Centre (contract from Sept 2012 to August 2015)

The Dialysis Provider is responsible for rostering of the nursing services. Staff numbers inclusive of the charge nurse as at 31 Dec 2013 is listed as follows:

Centre	Renal trained SN	SN	AN	DT	Total
Bishan	3	9	3	1	16
SWWT	2	10	2	0	14
Ghim Moh	3	13	0	0	16
Grand total					46

Training & Education

The Senior Nurse Clinician, Clinical Coordinator and Clinical Nurse, together with the Centre Charge Nurses are responsible for Training & Education for the service provider nursing staff. This is discussed in the Nursing report.

5 EQUIPMENT

DIALYSIS MACHINES

There are in total 59 dialysis machines. During the year 17 new Gambro AK96 dialysis machine were purchased

These were located as follows:

	Fresenius 4008S	Gambro AK96
Bishan	0	21
Kreta Ayer	0	17
Ghim Moh	21	0

WATER TREATMENT SYSTEMS

Water Treatment is essential for safe hemodialysis therapy.

All centres use the Reverse Osmosis System. Pretreatment comprises of backwashable multimedia, activated carbon filter, regenerable water softener and pre cartridge filter before entering the RO membranes via high pressure pumps to allow reverse osmosis to take place. This removes most of the dissolved solids from the feed water. The product water then passes

through 0.2 micron filter to be distributed to the dialysis stations. The distribution piping is a closed loop system.

Centre	Vendor	Year Installed
Bishan	Gambro	2009
Kreta Ayer	Gambro	2012
Ghim Moh	Transmedic	2007

The systems at Ghim Moh and SWWT centres undergo auto-washing and flushing before going onto standby mode at the end of each dialysis day whereas in Bishan centre the RO system will perform daily integrated heat disinfection at the end of each day.

Daily monitoring of RO system pressure parameters and chloramine checks are carried out at the beginning of the day before priming and mid shift. Chemical disinfection is done 6 monthly by the vendors for Ghim Moh centre. In Bishan and SWWT centres membrane disinfection is performed every 2 months by the nurses.

The chemical disinfectant used for RO disinfection as follows:

Bishan and SWWT centres – Dialox
Ghim Moh centre – Hydrogen Peroxide 22% and Peroxyacetic Acid 4.5%

Residual checks are conducted after disinfection to ensure that the system is clear of chemical before patient use. RO water and dialysate cultures for LAL and total microbial count samples are performed 2 monthly meeting local and international standards.

REUSE EQUIPMENT

Reuse is practiced using the Renatron Reprocessing machines. Dialysers from hepatitis positive patients are not mixed with those from serologically negative patients during washing.

There are in total 8 Renatron machines in the three centres (three each in Bishan and Kreta Ayer, two in Ghim Moh) linked to the Renalog Reprocessing Management (RM).

The Renalog RM dialyzer reprocessing management software is a Windows-based system that provides capabilities to analyze and manage automatic and manual dialyzer reuse operations. Renalog RM is able to provide different standard or specific reports that can be printed, viewed and exported to editable file formats.

Renalin 100 Cold Sterilant (containing Hydrogen Peroxide 20%) was classified as an explosive precursor since 1 Dec 07. In order to comply with the requirements of the Arms and Explosives Act, each of the centres has applied for a licence from the Singapore Police Force (SPF) for storage of the Renalin. The licence is renewed every 2 years.

Appropriate measures were taken to ensure that the service provider comply with the requirements. SPF conducts surprise checks.

6 PATIENT CARE

Ms Lay Kwee Chin (Senior Nurse Clinician) Ms Theresa Soh (Clinical Coordinator) and Ms Sunitha (Clinical Nurse) together oversee the paramedical team**.**

DIETETICS

Dietetic counseling was provided for, under the contract with the dialysis providers. Patients are seen at least once in 3 months at the centre. The dieticians assigned were Ms Lim Chi Lee by DaVita and Ms Liow Min Choo by Fresenius Medical Care.

PATIENT WELFARE

Ms Sandy Lim, Welfare Officer left in May 2013 taken over by Mr Jeffrey Loy and in charge of SWWT and PD patients, while Ms Rena Lee is in charge of Bishan and Ghim Moh patients.

Consistent with its mission, KDF patients are heavily subsidised.

The number of Medifund receipients were as follows:

Year	**No of Patients**	**% of HD pt**
2011		40.3
2012	105	44.7
2013	149	55.6

Patients continue to receive subsidies for dialysis fees, Erythropoietin and Calcijex, Venofer and Lanthanum Carbonate on a case by case basis.

Five (5) patients received civil service benefits.

DIALYSIS REVIEWS

Apart from the rounds which are carried out on a monthly basis by the doctors, Patient Services Senior Nurse Clinician, Clinical Coordinator or designee and Staff Nurse in charge of the patient will review problem cases with the Medical Director.

REPORTING OF INCIDENTS AND ADVERSE OUTCOMES

As mandated by MOH mortality statistics were provided to MOH on prescribed on their format since December 2011.

A process of incident reporting of adverse events is in place. Immediate action if required will be carried out by Dialysis Provider and reported to KDF Administration within 24 hours.

7 THE PATIENT POPULATION

KDF haemodialysis centres provide long term low dependency dialysis to the needy. Application requires both a social assessment as well as a medical assessment.

Aside from the provision of long term hemodialysis, KDF also provides:

A) an interim haemodialysis scheme started in May 2009 for patients temporarily requiring hemodialysis at a cheaper rate while awaiting permanent placement, CAPD temporarily on hemodialysis and bridging to transplantation.

B) Subsidies for KDF patients turning high dependency and considered unsuitable for low dependency dialysis. This was started in Dec 2009 to enable the patients to continue dialysis in a private sector where physician care/advice could be rendered more quickly.

As at 31 December 2013, we had 268 patients dialysing in 3 centres – 102 patients at Bishan Centre (BS), 82 at Kreta Ayer (SWWT) and 84 patients at Ghim Moh centre.

A. INTAKE AND EXITS

The following table shows the intake and exit of patients by year.

Table 7A-1 – Patient Stock & Flow

ENTRY	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
New Cases	5	18	5	10	13	18	26	28	12	32	31
New Cases (interim)		1	6	3	3	3	7	7	15	31	30
Transfers in from SDDU	0	0	0	0	0	0	0	0	0	0	0
Re-enter KDF	3	0	0	0	1	1	0	3	2	2	0
Total Entries	**8**	**19**	**11**	**13**	**17**	**22**	**33**	**38**	**29**	**65**	**61**
EXIT											
Transfer Out to non-KDF Programs	2	2	3	0	1	0	5	1	7	5	2
Transfer Out to KDF PD			5	3	2	2	1	2	3	7	3
Transplant	2	4	6	10	6	4	4	2	1	4	2*
Withdraw from Dialysis/Default	0	0	1	0	2	0	1	4	4	2	3
Deaths	4	6	5	11	2	9	8	8	20	13	18
Total Exits	**8**	**12**	**20**	**24**	**13**	**15**	**19**	**17**	**35**	**31**	**28**
Total No of Pt	**174**	**181**	**172**	**161**	**165**	**172**	**186**	**207**	**201**	**235**	**268**

* Cadaveric/Deceased Donor

Table 7A-2 –Mode of Dialysis

Interim HD		30
- Newly initiated subsequently permanent HD	23	
- Newly initiated awaiting PD	2	
- Newly initiated Bridge to Transplant		
- PD complications for temp HD		
- PD complications to permanent HD	2	
- Failed tx, back on HD	3	
Permanent HD [not via interim route]		31
- newly initiated	29	
- failed PD program, re-enter program		
- had been on dx, transferred to VWO from private	1	
- failed tx, back on HD	1	
TOTAL		61

Table 7A-3 – Source of Referral

	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
SGH	5	19	8	10	14	18	16	25	22	52	53
NUH	3	0	0	2	1	2	11	8	3	6	7
TTSH			2	1	1	1	1	2	1	3	0
AH / KPTH					1	0	4	3	3	4	1
Private	0	0	1	0	0	1	1	0	0	0	0
Total Entries	**8**	**19**	**11**	**13**	**17**	**22**	**33**	**38**	**29**	**65**	**61**

No patients were on interim haemodialysis while awaiting living related transplant but a few patients were waiting to enter the KDF Peritoneal Dialysis program.

B. DEMOGRAPHIC & PATIENT CHARACTERISTICS

Etiology of Renal Failure

The etiology of renal failure in new and prevalent patients was as follows:

Table 7B-1 – Etiology of Renal Failure in New Patients

	2007		2008		2009		2010		2011		2012		2013	
Etiology	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chronic glomerulonephritis	4	*23.5*	4	*18.2*	6	*18.1*	14	*36.8*	6	*20.7*	18	*27.7*	13	*21.3*
Diabetic nephropathy	9	*52.9*	13	*59.1*	20	*60.6*	14	*36.8*	14	*48.3*	27	*41.5*	37	*60.7*
Lupus nephritis	0	*0*	1	*4.5*	1	*3.1*	0	*0*	0	*0*	1	*1.5*	0	*0*
Obstructive uropathy	0	*0*	0	*0*	0	*0*	1	*2.6*	2	*6.9*	1	*1.5*	0	*0*
PCKD	0	*0*	1	*4.5*	1	*3.1*	2	*5.3*	1	*3.4*	2	*3.1*	0	*0*
TB kidney	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	1	*1.5*	0	*0*
Hypertension	1	*5.9*	1	*4.5*	0	*0*	1	*2.6*	1	*3.4*	2	*3.1*	3	*4.9*
Others	3	*17.6*	0	*0*	0	*0*	4	*10.6*	4	*13.8*	6	*9.2*	4	*6.6*
Unknown Etiology	0	*0*	2	*9.1*	5	*15.1*	2	*5.3*	1	*3.4*	6	*9.2*	4	*6.6*
Total	17	*100*	22	*100*	33	*100*	38	*100*	29	*100*	65	*100*	61	*100*

The majority of new cases were patients with diabetes mellitus (62.1%) and chronic GN (20.7%).

Table 7B-2 – Etiology of Renal Failure in Prevalent Patients

	2007		2008		2009		2010		2011		2012		2013	
Etiology	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chr glomerulonephritis	93	*56.4*	90	*52.3*	86	*46.2*	93	*44.9*	88	*43.8*	96	*41.4*	97	*36.2*
Diabetic nephropathy	33	*20.0*	40	*23.3*	53	*28.5*	62	*30.0*	57	*28.4*	69	*29.7*	98	*36.6*
Lupus nephritis	8	*4.8*	9	*5.2*	10	*5.4*	10	*4.8*	10	*5.0*	9	*3.9*	9	*3.4*
Obstructive uropathy	0	*0*	0	*0*	0	*0*	2	*1.0*	2	*1.0*	2	*0.9*	2	*0.8*
PCKD	2	*1.2*	2	*1.2*	3	*1.6*	5	*2.4*	6	*3.0*	8	*3.4*	10	*3.7*
TB kidney	1	*0.6*	1	*0.6*	1	*0.5*	0	*0*	1	*0.5*	2	*0.9*	2	*0.8*
HT	3	*1.3*	4	*2.3*	4	*2.2*	4	*1.9*	5	*2.5*	7	*3.0*	10	*3.7*
VUR	2	*1.2*	2	*1.2*	2	*1.1*	2	*1.0*	2	*1.0*	3	*1.3*	3	*1.1*
Others	9	*5.5*	8	*4.6*	9	*4.8*	10	*4.8*	13	*6.5*	17	*7.3*	18	*6.7*
Unknown Etiology	14	*8.5*	16	*9.3*	18	*9.7*	19	*9.2*	17	*8.5*	22	*9.4*	21	*7.8*
Total	165	*100*	172	*100*	186	*100*	207	*100*	201	*100*	232	*100*	268	*100*

There are now more patients with diabetic nephropathy (36.6%) than chronic glomerulonephritis (36.2%)

Gender

Table 7B-3 – Gender of New Patients

	2006		2007		2008		2009		2010		2011		2012		2013	
Gender	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Males	4	30.8	11	*64.7*	14	*63.6*	16	*48.5*	21	*55.3*	18	*62.1*	28	*43*	35	*57.4*
Females	9	69.2	6	*35.3*	8	*36.4*	17	*51.5*	17	*44.7*	11	*37.9*	37	*57*	26	*42.6*
Total	13	*100.0*	17	*100.0*	*22*	*100.0*	33	*100*	38	*100*	29	*100*	65	*100*	61	*100*

Table 7B-4 – Gender of Prevalent Patients

	2006		2007		2008		2009		2010		2011		2012		2013	
Gender	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Males	72	*44.7*	79	*47.9*	82	*47.7*	87	*46.8*	96	*46.4*	96	*47.5*	112	*47.7*	133	*49.6*
Females	89	*55.3*	86	*52.1*	90	*52.3*	99	*53.2*	111	*53.6*	105	*52.4*	123	*52.3*	135	*50.4*
Total	161	*100*	165	*100*	172	*100*	186	*100*	207	*100*	201	*100*	235	*100*	268	*100*

At the end of 2013, the ratio of male to female patients was 133:135.

Ethnic Distribution

Table 7B-5 – Ethnic Distribution of New Patients

	2007		2008		2009		2010		2011		2012		2013	
Race	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chinese	13	*76.5*	16	*72.7*	18	*54.6*	27	*71.0*	20	*67.0*	37	*56.9*	38	*62.3*
Malay	4	*23.5*	5	*22.7*	11	*33.3*	6	*15.8*	8	*27.6*	18	*27.7*	17	*27.9*
Indian	0	*0*	1	*4.5*	4	*12.1*	5	*13.2*	1	*3.4*	9	*13.8*	6	*9.8*
Others	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	1	*1.5*	0	*0*
Total	17	*100*	22	*100*	33	*100*	38	*100*	29	*100*	65	*100*	61	*100*

Table 7B-6 – Ethnic Distribution of Prevalent Patients

	2007		2008		2009		2010		2011		2012		2013	
Race	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***
Chinese	126	*76.4*	138	*77.3*	138	*74.2*	153	*73.9*	145	*72.1*	163	*69.4*	184	*68.7*
Malay	27	*16.4*	36	*17.4*	36	*19.4*	38	*18.4*	42	*20.9*	54	*23*	61	*22.8*
Indian	12	*7.3*	12	*5.2*	12	*6.4*	16	*7.7*	14	*7.0*	17	*7.2*	22	*8.2*
Others	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	1	*0.4*	0	*0*
Total	165	*100*	172	*100*	186	*100*	207	*100*	201	*100*	235	*100*	268	*100*

The ethnic distribution of our prevalent patients was 68.7% Chinese, 22.8% Malays and 8.2% Indians.

Age

The mean age at entry in 2013 was 56.1 $\pm$ 9.3 years (median, 57.1). Nine (9) patients were above the age of 65 years

Table 7B-7 – Average age of entry into the Programme

Year	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Mean Age (years)	56.6	58.8	56.6	56.7	56.9	56.5	56.1
SD	12.9	12.4	12.5	10.4	12.5	12.5	9.3
Min	26.9	33	26	34.5	32.7	23.5	30.7
Max	73.0	78	76	81.9	78.9	80.2	74.1

Average age of new patients with diabetic nephropathy was 55.2 years compared with 57 years in non-diabetics.

Table 7B-8 – Average age of Prevalent patients on the Programme

Year	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Mean Age (years)	53.8	55.5	56.2	57.4	57.7	58.7	58.7
SD	9.9	9.7	10.3	10.3	10.8	10.8	10.5
Min					28.0	29.0	30.0
Max					86.0	87.0	88.0

Age of the prevalent dialysis population at the end of 2013 was 58.7 $\pm$ 10.8 years (median 59.2). The mean prevalent age continues to rise as the existing population ages with a low turnover with influx of elderly new patients.

COMORBIDITY

Table 7B-9 – Common Comorbidities in Incident patients

Year	2007		2008		2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Diabetic	11	64.7	10	45.5	22	71	20	52.6	19	65.5	31	47.7	35	59.3
IHD n oth cardiac dis	2	11.8	5	22.7	15	48.4	22	57.9	6	20.7	21	32.3	20	33.9
CVA	0	0	4	18	7	22.6	4	10.5	1	3.4	1	1.5	1	1.7
PVD	1	5.9	1	4.5	5	16.1	4	10.5	1	3.4	6	9.2	7	11.9

Table 7B-10 – Common Comorbidities in Prevalent patients

Year	2007		2008		2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Diabetics	44	26.7	45	26.2	65	34.9	69	33.3	67	33.3	81	34.5	107	39.9
IHD n oth cardiac	42	25.5	37	25.1	59	31.7	57	27.5	45	23.4	46	19.6	71	26.5
CVA	7	4.2	9	5.2	15	8.1	14	6.8	11	5.5	11	4.7	12	4.5
PVD	5	5	6	3.5	7	3.8	11	5.3	7	3.5	11	4.7	15	5.6

The proportion of diabetics in the prevalent dialysis population has increased 39.9%.

The proportion of patients with cardiac problems has increased 26.5%.

HOSPITALIZATIONS

Hospitalizations during the period 1 January 2013 to 31 December 2013 were analyzed and expressed as episodes and days hospitalized per patient year of dialysis programme. There were 521 hospitalization episodes in 180 patients. Thus, 67.2% of the patients were ever admitted that year.

Table 7B-11 – Admission Rates

	2009		2010		2011		2012		2013	
	No	%	No	%	No	%	No	%	No	%
No of Patients admitted in ref year	134	63.4%	141/224	62.9%	160/235	69.9%	180/266	67.7	212/296	71.6
- Diab pt adm / all diab	51	70.8%	69/85	81.2%	75/97	77.3%	80/99	80.8	99/118	83.9
- Non-diab pt adm / all	83	59.4%	72/139	51.8%	89/138	64.5%	100/154	64.9	113/150	75.3

DEATHS AND WITHDRAWALS

A total of 28 patients left the programme. Reasons were as follows:

Three (3) patients was on interim haemodialysis and transferred to PD programme; 2 patients received a deceased donor transplant
2 patients withdrew from dialysis treatment.
3 patients transferred to other centres

There were 18 deaths – 5 from cardiac causes, 5 from septicaemia/ infection 4 from pneumonia, 2 from ESRD, 1 from unknown cause and 1 died at home.

Table 7B-13 – Deaths and Withdrawals

	2008	2009	2010	2011	2012	2013
Transfers						
- PD	2	2	3	3	7	3
- Other	-	4 (high dep)	1	7	5 (high dep)	3 (1 to high dep)
Transplants	4	4	2	1	4*	2
Withdrawals	-	1	1	4	2	2
Deaths	9	8	8	20	13	18
Total	**15**	**19**	**17**	**35**	**31**	**28**

D. DIALYSIS PARAMETERS

We aim to put all patients are on high flux dialyzers.

Table 7D-1: Types of Dialyzers used

	2007		2008		2009		2010		2011		2012		2013	
	n	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***
F6	1	*0.6*	3	*1.7*	2	*1*	1	*0.5*	2	*1*	0	*0*	6	*2*
F7	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*
HF50	13	*7.9*	13	*7.6*	17	*9*	19	*9.2*	21	*10*	22	*9.4*	19	*7*
HF60	38	*23.0*	41	*23.8*	40	*22*	37	*17.9*	49	*24*	60	*25.5*	66	*25*
HF80	10	*6.1*	10	*5.8*	9	*5*	15	*7.2*	32	*16*	36	*15.3*	51	*19*
HF100	8	*4.8*	8	*4.7*	9	*5*	8	*3.9*	12	*6*	14	*6*	24	*9*
PolyFlux6L	1	*0.6*	1	*0.6*	0	*0*	0	*0*	0	*0*	3	*1.3*	0	*0*
PolyFlux11			0	*0*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*
PolyFlux14	54	*32.7*	55	*32*	65	*35*	77	*37.2*	45	*22*	56	*23.8*	46	*17*
PolyFlux17	25	*15.2*	25	*14.5*	30	*16*	34	*16.4*	30	*15*	33	*14*	43	*16*
PolyFlux21	14	*8.5*	15	*8.7*	14	*8*	16	*7.7*	10	*5*	11	*4.7*	13	*5*
FB210U	1	*0.6*	1	*0.6*	0	*0*	0	*0*	0	*0*	0	*0*	0	*0*
TOTAL	165	*100*	172	*100*	186	*100*	207	*100*	201	*100*	235	*100*	268	*100*

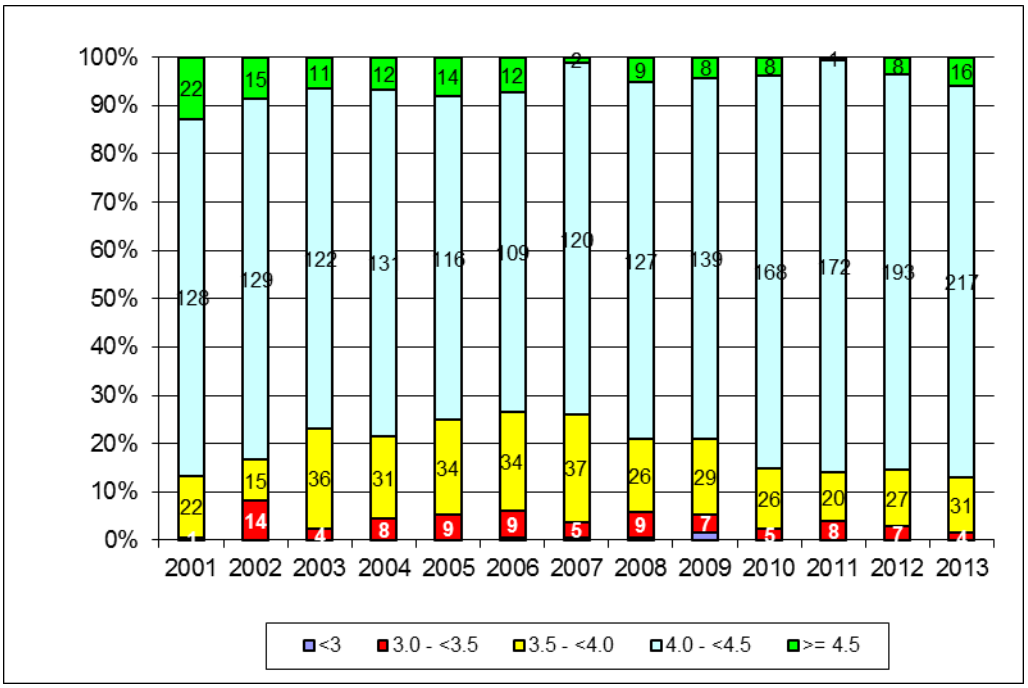
Only 6 patients (2 %) were using low flux dialyzers.

Table 7D-2: Average Blood flow Used (ml/min)

ml/min	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Mean	272	273	270	267	267	267	270
Std Dev	36	34	35	31	34	33.4	33.9
Min	180	150	150	150	180	200	180
Max	360	360	360	360	360	360	360

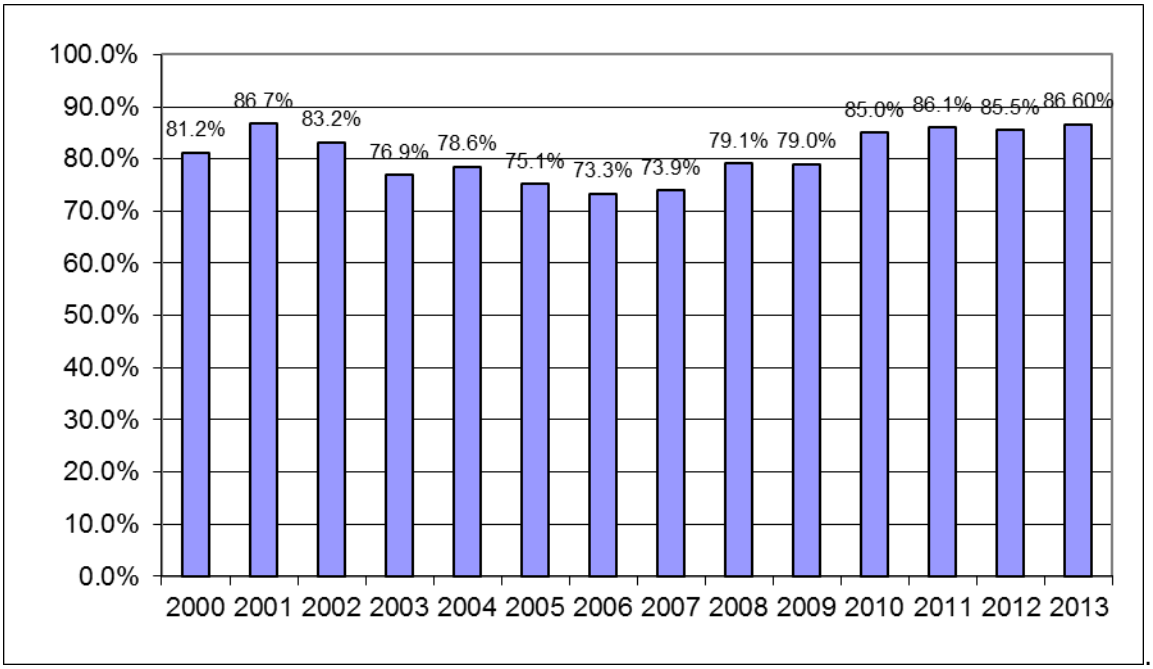
Blood flow is set at a minimum of 200 ml/min and averaged 270 $\pm$ 33.9 ml/min (range 180 - 360).

Fig 7D-1: Dialysis Time Per Session



Most patients (86.6%) dialyze for 4 hours or more as compared to the previous year (85.5%).

Fig 7D-2: Percentage of patients Dialyzing 4 hours or more per session



.

DIALYZER REUSE

All centres use the Renatron System. Maximum reuse is 15 times. The following is the practice for virology positive cases

HIV positive cases: There are no HIV positive cases

Hep B positive cases: No reuse is practiced for Hep B positive cases in all centres.

HCV positive cases: Bishan and SWWT centres reuse HCV positive dialysers while Ghim Moh centre practices single use.

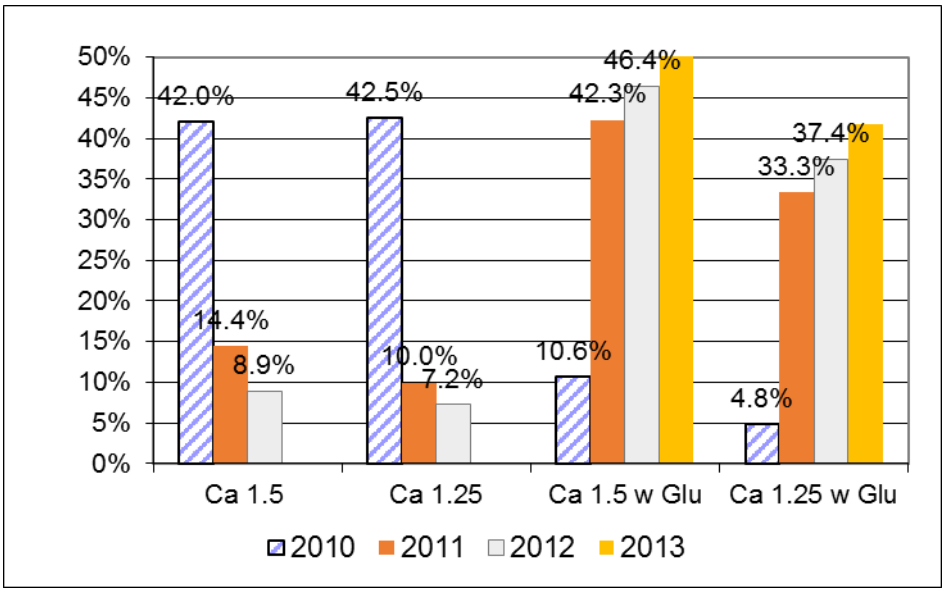
DIALYSATE

Dialysate available contains

- potassium value of 2.0 mmol/L
- calcium of 1.5 mmol/L and 1.2 mmol/L
- glucose of 10 mmol/L

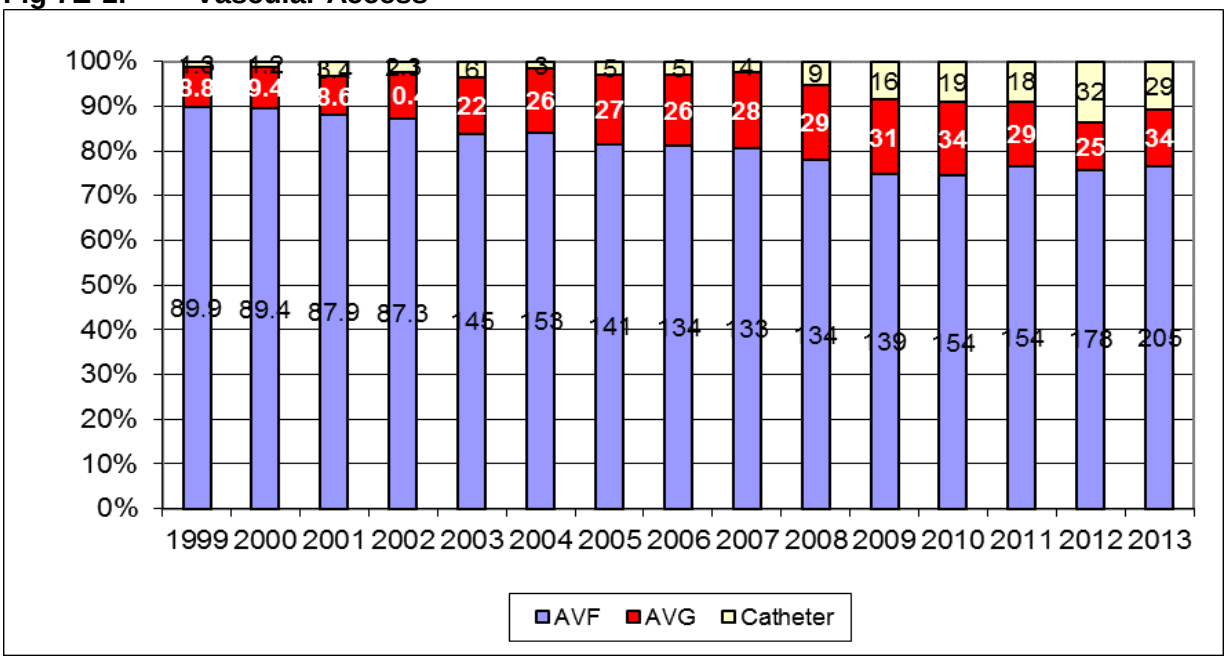
Dialysate containing 1.5 mmol/L calcium and 11 mmol/L glucose was first introduced in SWWT centre on 2nd December 2008 for diabetic and elderly patients. All patients in Bishan centre were provided with dialysate with glucose with either calcium 1.5 or 1.2 mmol/L from July 2011. With effect from September 2013, all patients in SWWT centre were also provided with glucose containing dialysate.

Fig 7D-3: Dialysate Calcium and Glucose



E. VASCULAR ACCESS

Fig 7E-1: Vascular Access



Thirty-four patients or 12.7% (34/268) were using grafts for vascular access, slightly higher than last year (10.6%). This is compared to 8.8% in 1999. Twenty-nine (29) patients were on temporary catheters (10.8%) lower than last year (13.6%). The rest were using AV fistulae (76.5%), slightly higher than last year (75.7%).

We continue to use the Transonic machine for monitoring the access flows and recirculation in the vascular access. This performed every 6 months unless the flows are below 600 ml/min. The average flow for AVF's was 1200 $\pm$ 572 ml/min (median 1040 ml/min). The average flow for AVG's was 893 $\pm$ 432 ml/min (median 790 ml/min). There were no patients with recirculation.

Any patient who had recirculation above 5% or persistently low access flow with reduction of 25% over the past 3 months was referred back to their respective hospitals for assessment.

F. DIALYSIS ADEQUACY

This assessment is performed every 2 months using a pre and post blood urea performed on a midweek dialysis session to calculate the single pool KT/V as follows:

$$KT/V = -\ln (R - 0.03) + (4 - 3.5 \times R) \times UF/W$$

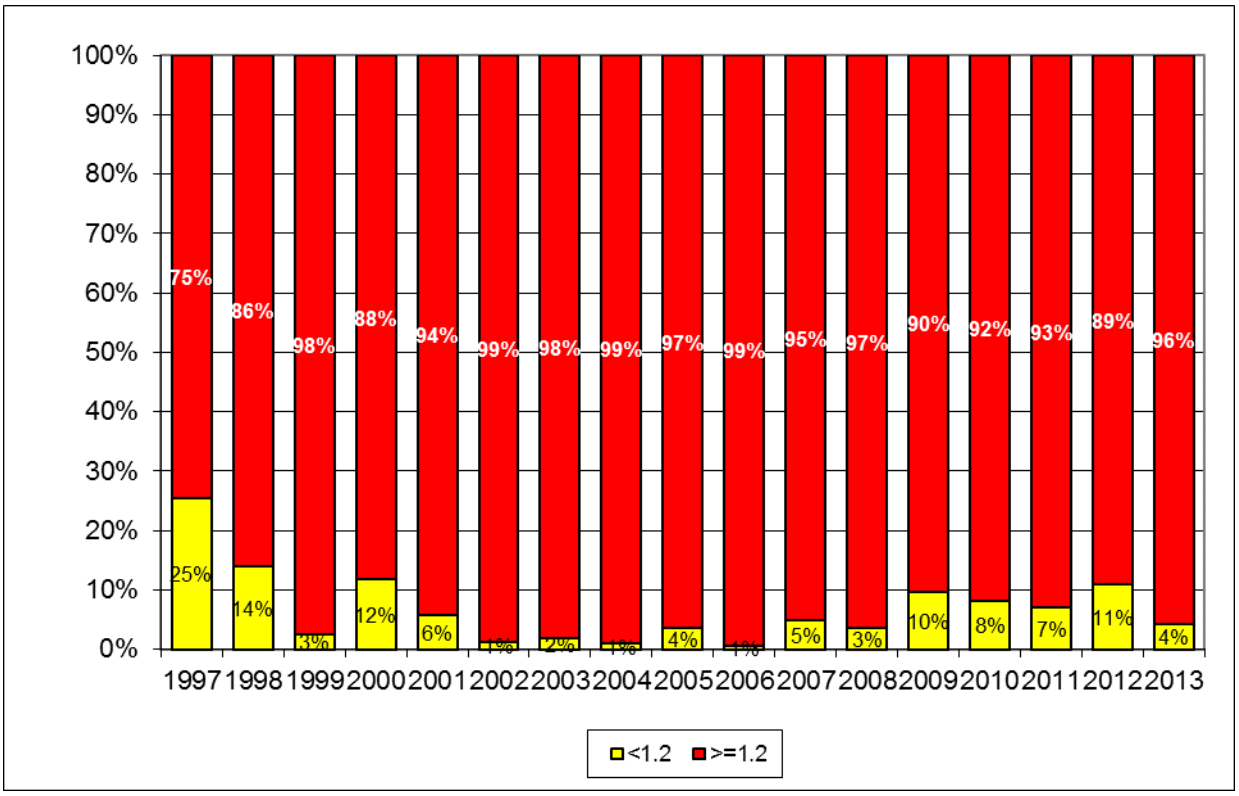
where R = post/pre urea
UF = ultrafiltration in litres
W = post dialysis weight

The formula used is that adapted from "Handbook of Dialysis" Ed JT Daugirdas & TS Ing.

Our patients weighed 61.2 ± 15.6 kg (median 59.5 kg, range 33.8 – 132.7 kg).

The proportion of patients with KT/V of 1.2 or greater in November / December 2013 was 95.8%.

Fig 7F-1: Percentage with KT/V index > 1.2



The proportion of patients with low KT/V has decreased to 4%.

G. ANAEMIA

The mean Hb was calculated to be 10.9 ± 1.48 g/dl (range 6.7 – 14.9). This has been stable over the past few years. The percentage of patients with a haemoglobin count of less than 10 g/dl was 25.4% slightly higher than last year (25%).

Fig 7G-1: Average Hemoglobin

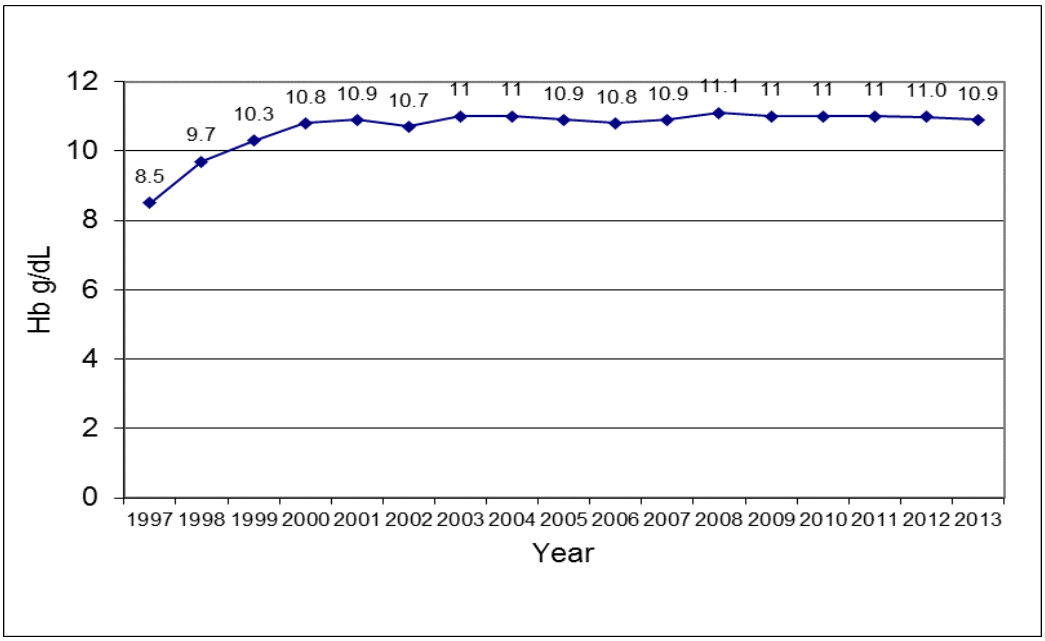


Fig 7G-2: Hb Frequency

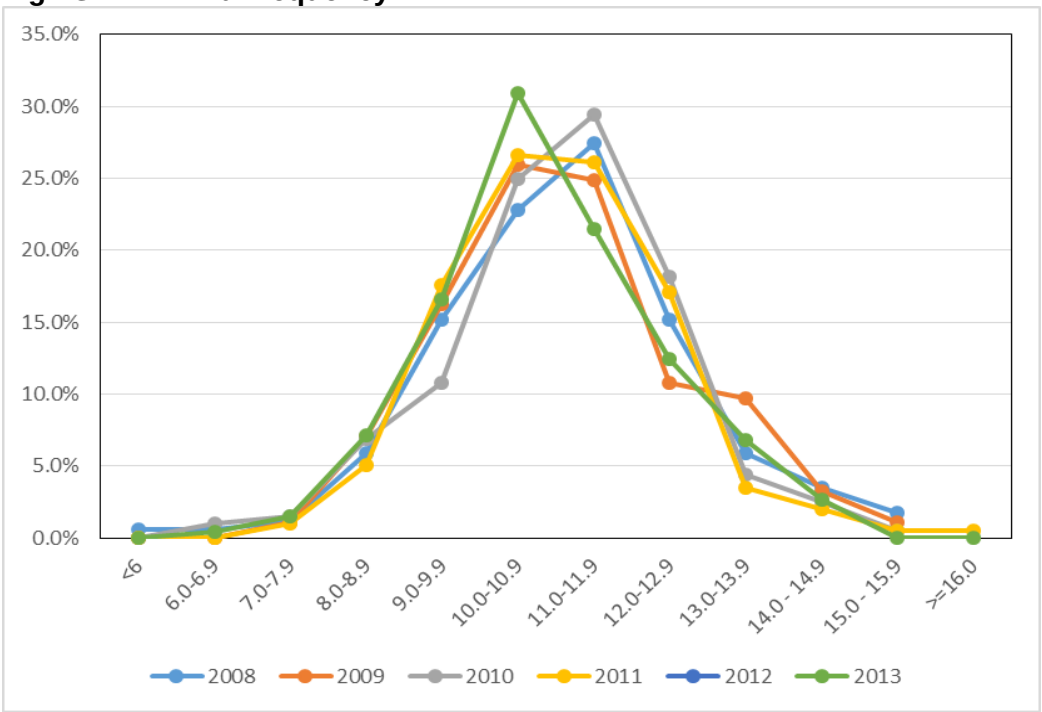
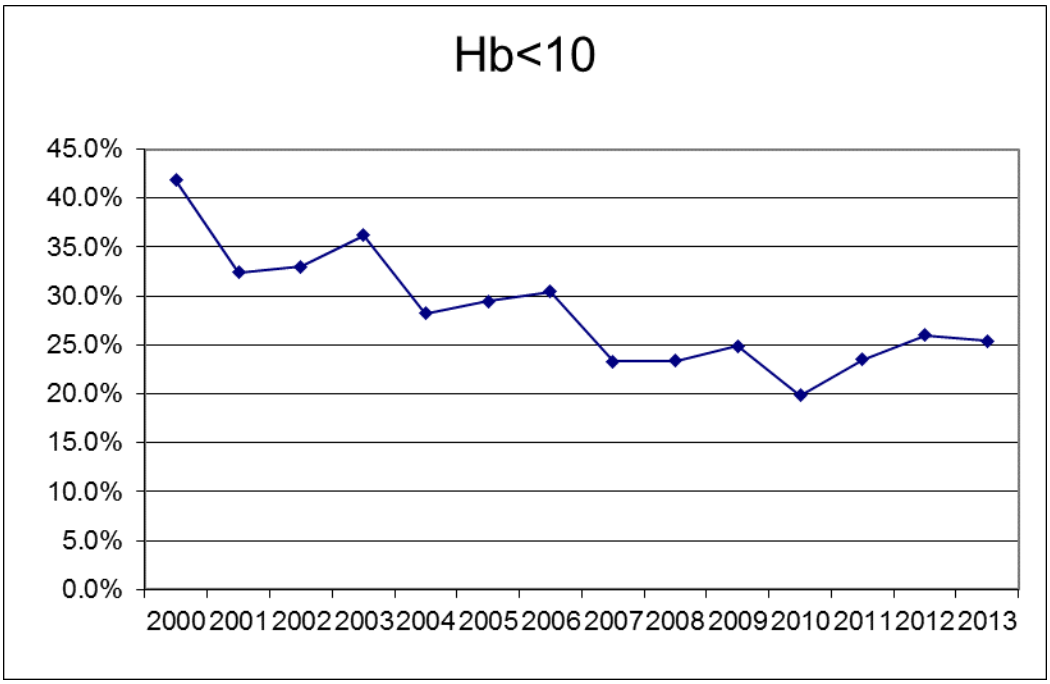


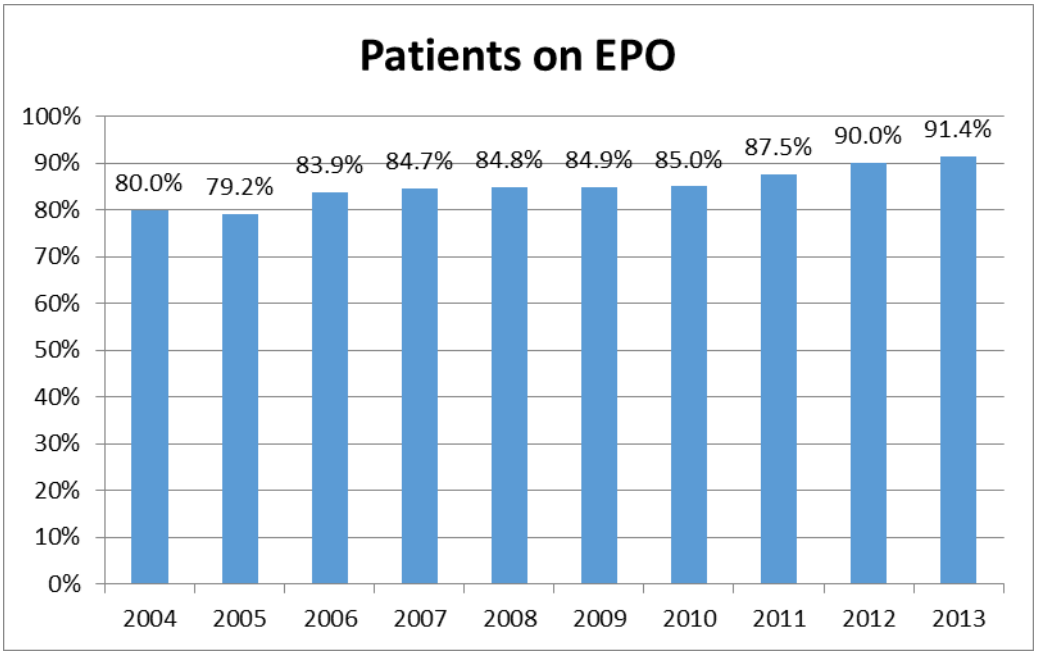
Fig 7G-3: Hb <10



ERYTHROPOIESIS STIMULATING AGENTS

Patients are advised to start erythropoietin when their Hb falls below 10 g/dl. Target Hb while on erythropoietin is 11-12 g/dl. The proportion of patients with Hb < 10 g/dl slightly decreased 25%. The proportion of patients on ESA is still rising

Fig 7G-4: Proportion of Patients on ESA



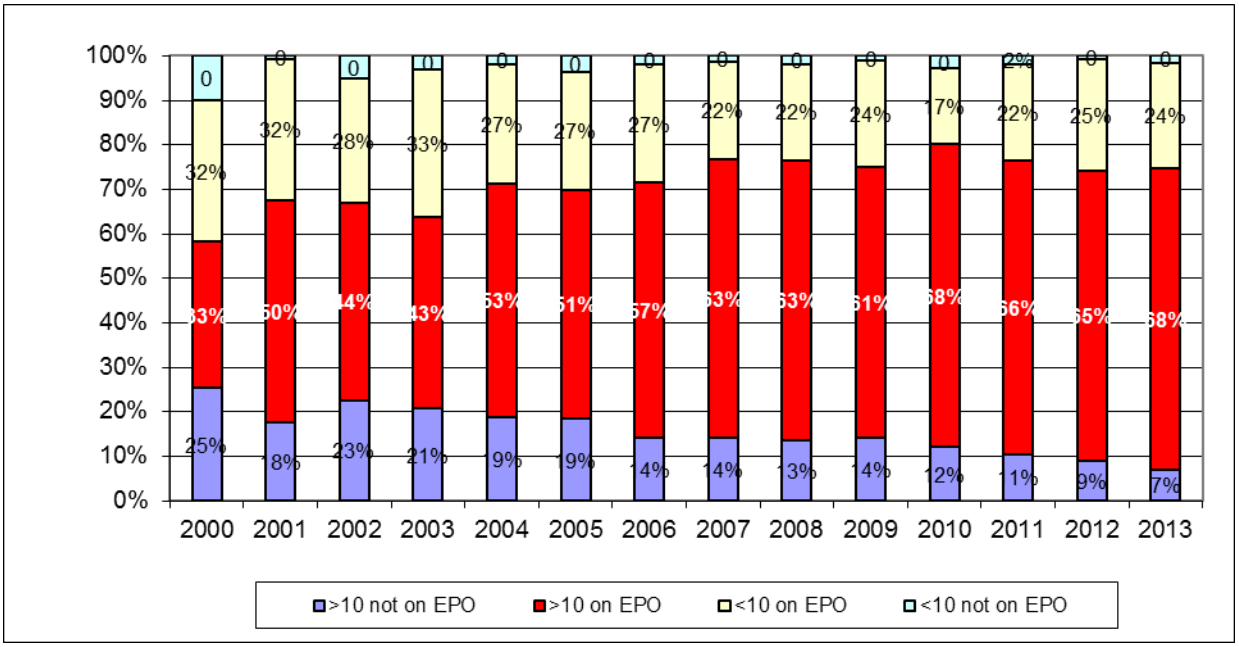
The cost of erythropoietin is Medishield claimable if the patient is eligible. In addition, patients are also eligible to apply for the Foundation's subsidy programme. There is no cap on the erythropoietin subsidy

Patients who were on EPO used on the average 105.2 ± 59.4 units/kg/wk (median 91.5) less than last year's figure

Because of the possibility of pure red cell aplasia from erythropoietin administration, all erythropoietin is now administered by the intravenous route. SWWT-Kreta Ayer and Ghim Moh Centres used Eprex until Dec 2013 when there was changed to Recormon after a tender exercise. Bishan centre continued to use Recormon.

Twenty-three (23) patients (8.6%) were not on EPO. They had a mean Hb of 12.2 g/dl (range 8.4 – 14.9). Only 4 patients (1.5%) with Hb below 10 g/dl were not on EPO.

Fig 7G-5: Use of Erythropoietin



Of note is the reduced proportion of patients with Hb<10g/dl not using EPO compared with 10 years ago. There is also a smaller proportion of patients with Hb>10 g/dl not requiring EPO.

IRON STATUS

Table 7G-1 : Transferrin Saturation

	2006	2007	2008	2009	2010	2011	2012	2013
Mean (%)	39.2	33.5	37.9	36.7	34.2	34.6	32.8	33.4
SD	16.9	16.3	18.2	17	15	15	15	15.3
% pats w TFSat <20%	6.7	19.6%	9.9%	10.8%	11.1%	10.4%	13.6%	15.3%
Average HB when TFSat<20% (g/dl)	10.5	10.7	11.4	10.9	10.4	10.8	11.2	10.5
% pats w TFSat >20%	93.3	80.4	90.1	88.7	87.9	88.6	83.8	84.0
Average HB when TFSat>20% (g/dl)	10.8	10.9	11	11	11	11	11	11

As at the end of 2013, mean transferrin saturation was 33.4 $\pm$ 15.3 % (range 8.3 – 87.9). The proportion of patients with transferrin saturation of less than 20% was 15.7%, higher than the previous year. 42.5% (17/40) in this iron deficient group had a Hb of less than 10 g/dl. The average Hb of patients with transferrin saturation greater or equal to 20% was 11 g/dl compared with 10.5 g/dl for those whose TF Sat was <20%

129 (48%) patients used intravenous iron (Venofer) in 2013. Sixty-one (61) used Venofer to replenish iron stores (as compared to 49 in 2012) while 106 (22.8%) patients used it for maintenance. A subsidy scheme for Venofer has been available since April 2005.

Table 7G-2: Ferritin

	2008	2009	2010	2011	2012	2013
Mean	580	547	525	543	597	626
SD	573	333	392	356	454	467
% pats w Ferritin < 200	17.5%	10.3%	14.5%	15.4%	16.4%	14.6%

Using S Ferritin, 14.6% are iron deficient

BLOOD TRANSFUSION

A total of 22 patients received 51 units of blood during admissions to hospital.

H. NUTRITION

Mean S Albumin was 38.8 ± 3.6 g/l. The number of patients with Serum albumin less than 40 g/dl was 54.1%. Much improvement as compared to last year (95.7%).

Table 7H-1 : Normalised Protein Catabolic Rate and S Albumin

	2007	2008	2009	2010	2011	2012	2013
NPCR (g/kgBW)							
• Mean ± SD	1.14 ± 0.24	1.07 ± 0.23	1.09 ± 0.26	1.06 ± 0.26	1.05 ± 0.24	1.01 ± 0.24	1.07 ± 0.24
• % < 1.2	64.8	75	71	73.9	78.4	79.6	72
S Albumin (g/l)							
• Mean ± SD	34.3 ± 3.4	33.9 ± 3.8	33.9 ± 3.4	34.5 ± 3.4	35 ± 3.2	34.1 ± 3.5	38.8 ± 3.6
• % <40	95.7	90.0	90.3	88.4	93.5	95.7	54.1
• % <35	59.1	50.0	51.1	48.8	49.3	49.8	15.7

Supplemental feeds were provided upon the advice of the centre's dieticians to patients at a highly subsidized price from September 2011. A total 63 patients are on Beneprotein.

I. MINERAL METAB

Table 7I-1 : Serum Calcium levels

	2005	2006	2007*	2008	2009	2010	2011	2012	2013
Mean S Calcium (mmol/L)	2.44	2.38	2.44	2.46	2.46	2.3	2.37	2.39	2.26
SD	0.25	0.22	0.21	0.20	0.21	0.23	0.18	0.20	0.22
Min		1.26	1.79	2.01	1.73	1.68	1.86	1.71	1.79
Max		2.88	3.04	3.06	3.2	3.79	2.92	3.3	3.93

* S Calcium corrected for S Albumin reported from 2007

The mean corrected serum calcium value was 2.26 ± 0.22 mmol/l. Low calcium dialysate is currently in use for 41.8% of the patients 41.8% (112/268).

Table 7I-2 : Serum Phosphate levels

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Mean S PO4 (mmol/L)	1.88	1.75	1.79	1.55	1.65	1.54	1.5	1.57	1.52
SD	0.51	0.44	0.52	0.38	0.47	0.47	0.42	0.44	0.43
% with S PO4>2.0 mmol/l	41.6	29.1	31.7	11	11.8	18.4	11	14.0	11.6
% with S PO4 >1.78 mmol/l (KDOQI)						30.0	24.0	28.0	23.5
Min	0.38	0.49	0.66	0.62	0.7	0.42	0.57	0.56	0.37
Max	3.63	3.37	3.65	2.55	3.25	3.12	2.57	3.3	2.92

Mean S Phosphate was 1.52 ± 0.43 mmol/l. The patients having values above 2.0 mmol/l was 11.6% as compared to 14% the previous year.

Fig 7I-1 : Phosphate binders in use by type

Only 5.6% of patients are not on binders. 82.1% are on one type, 12.3% on 2 types

Majority of patients are on calcium-based phosphate binders of which 72.8% [162/268] are on calcium acetate.

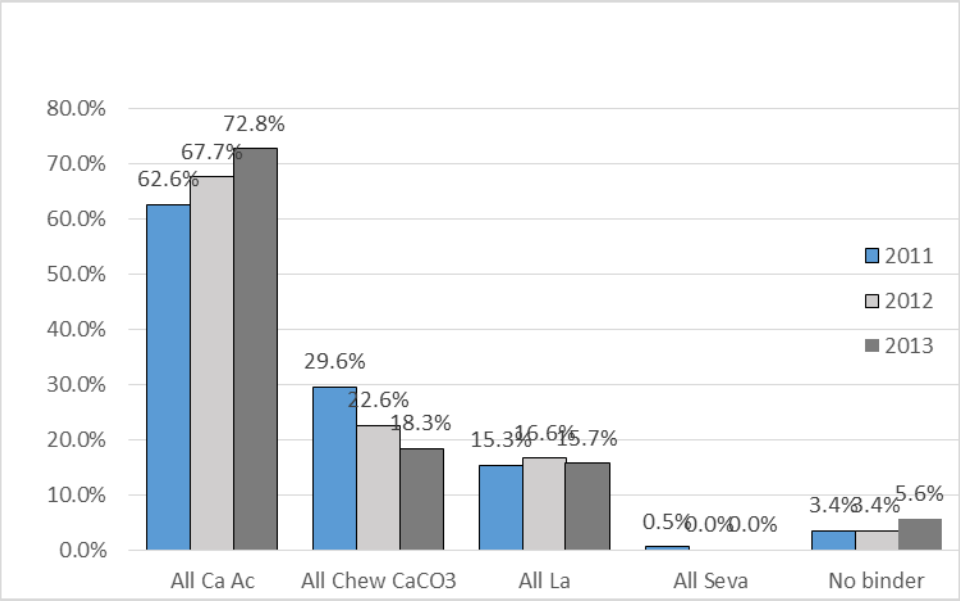
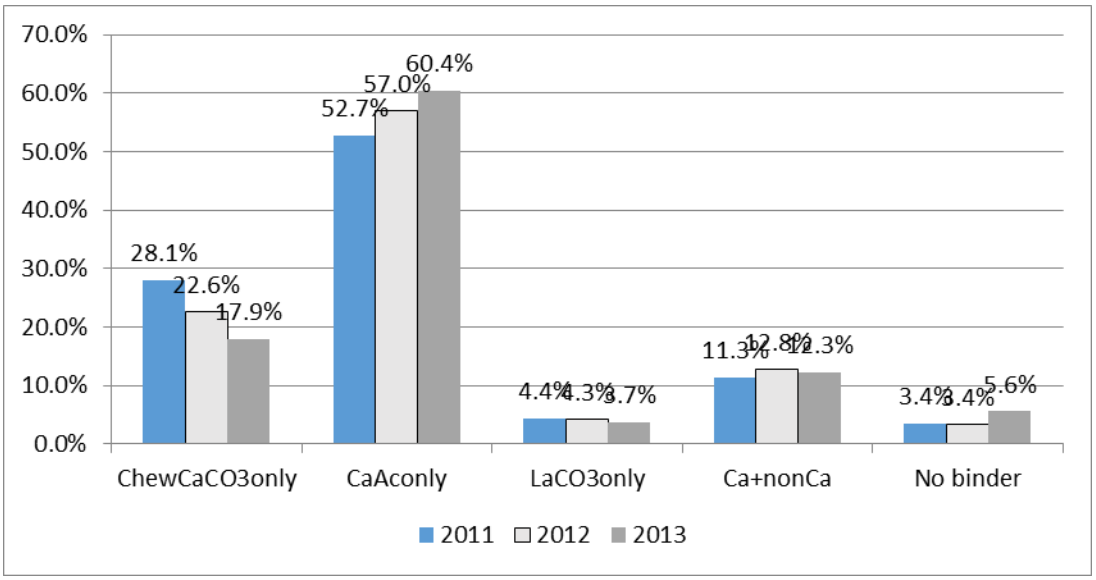


Fig 7I-2 : Phosphate binders in use by combination



Non calcium non-aluminum binders (Lanthanum and Sevelamer) use has increased to 17.9%. A small proportion (12.3%) [33/268] used calcium based binders in combination with non-Ca-non-Aluminum binders. KDF provides a subsidy for these expensive phosphate binders. One patient was on Aluminum.

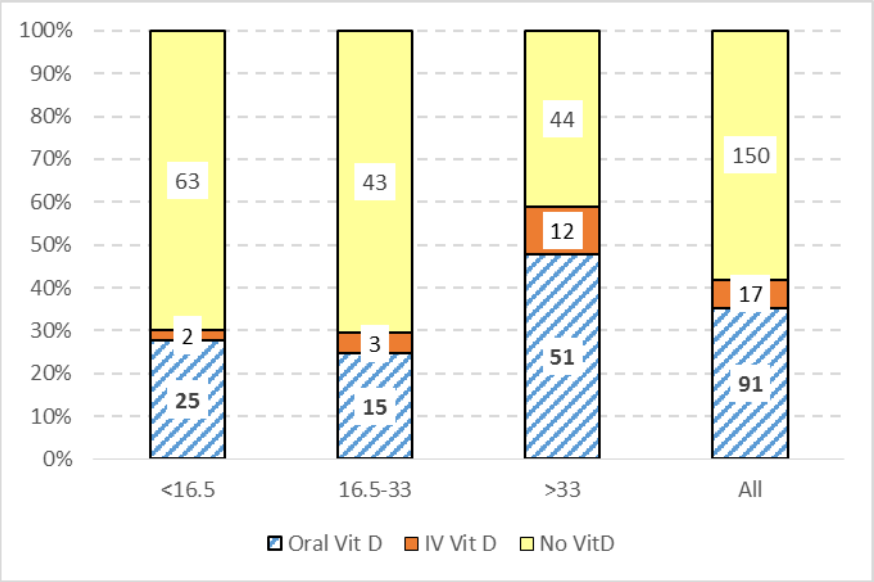
The KDOQI guidelines of 2003 (AJKD Vol 42 October 2003 Suppl 3) recommends treatment for patients on dialysis (CKD Stage 5) when iPTH exceed 33 pmol/l should be treated with Vit D analogs to main the PTH at 16.5-33 pmol/l. Recent KDIGO guidelines recommend keeping iPTH within 2-9 times of the upper limit.

Table 7I-3 : PTH levels

	2009	%	**2010**	%	**2011**	%	**2012**	%	**2013**	%
<16.5	71	*38.4*	80	*39.2*	77	*38.9*	87	*38.8*	90	*34.9*
16.5-33	31	*16.8*	38	*18.6*	45	*22.1*	47	*21.0*	61	*23.6*
>33.0	83	*44.9*	86	*42.2*	76	*38.4*	90	*40.2*	107	*41.4*
Total	185	*100*	204	*100*	198	*100*	224	*100*	258	*100*

40% (107) patients have intact parathyroid hormone levels elevated beyond 33 pmol/l. Hyperparathyroid bone disease is still a significant problem in the dialysis population.

Fig 7I-3 : Parathyroid Hormone levels and Vit D Treatment



In the group with low PTH (<16.5 pmol/l) which constitutes 34.9% (90 patients) of all cases, only 9.7% (25) were on oral Vit D and two on iv Vit D.

K/DOQI aims for a PTH level of 16.5 – 33 pmol/l. Only 23.6% of all patients had PTH values in this range. 58.9% (63/107) of patients with PTH>33 pmol/l being treated with Vit D. A subsidy scheme for Calcijex was started in April 2005. Hyperphosphatemia and hypercalcemia often preclude them from treatment. One patient is on Paricalcitol.

The newer KDIGO guidelines suggest a target PTH between 2 – 9 times the upper limit of normal (approx. 50 pmol/l)

A total of 45 patients had parathyroidectomy bringing the prevalent rate to 16.8% (45/268).

J. DIABETICS

The prevalent number of diabetic patients was 92 (39.1%) This is not surprising as diabetic nephropathy is the etiology of ESRD in more than half of all new cases.

K. HYPERTENSION

78% (209/268) have recorded high blood pressures or have their blood pressures controlled with anti-hypertensive agents.

Table 7K-1 : Use of Antihypertensive Agents by number of Drugs

	2007	2008	2009	2010	2011	2012	2013
None	37.0%	29.7%	27.4%	22%	22%	19%	22%
1 Drug	31.5%	28.5%	28.5%	33%	31%	34%	32%
2 Drugs	23.0%	27.3%	26.3%	27%	29%	26%	28%
3 Drugs	6.1%	9.9%	14%	14%	14%	19%	15%
4 drugs	2.4%	4.7%	3.8%	4%	3%	3%	3%
	100%	100%	100%	100%	100%	100%	100%

About 20% of the patients were not on antihypertensives and another 32% on one drug only.

Calcium channel blockers, beta blockers and ACEI/ARB were the most common types of antihypertensives used.

Table 7K-2 : Use of Antihypertensive Agents by Drug Type

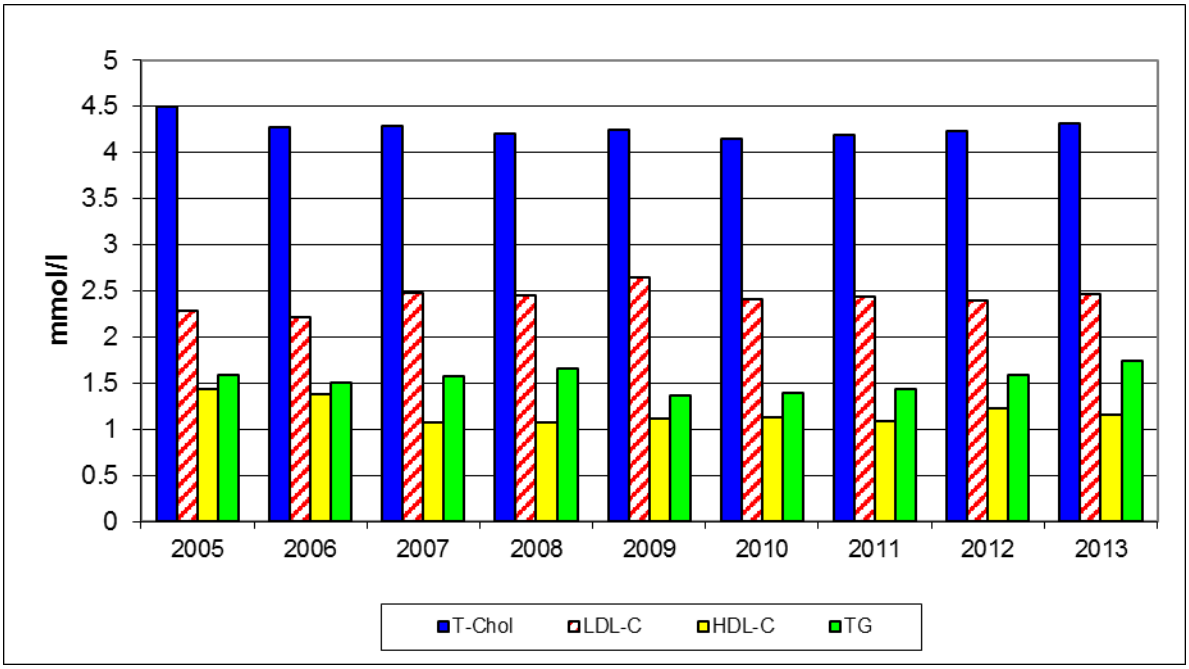
	2007	2008	2009	2010	2011	2012	2013
None	37.0%	29.7%	27.4%	22.2%	21.9%	11%	22%
Beta blockers	38.8%	43.6%	47.3%	50.2%	53.7%	35%	58.2%
Calcium channel Blockers	33.3%	43.6%	43%	45.9%	49.8%	27%	40.3%
ACEI / ARB	26.7%	33.7%	37.6%	36.2%	32.8%	24%	35.4%
Others	4.8%	4.7%	13.4%	5.8%	7%	3%	2%

These are <u>not</u> mutually exclusive.

L. HYPERLIPIDEMIA

Mean total cholesterol and HDL-Cholesterol and Triglyceride levels increased marginally compared with the previous year LDL-cholesterol ratio and triglyceride level decreased.

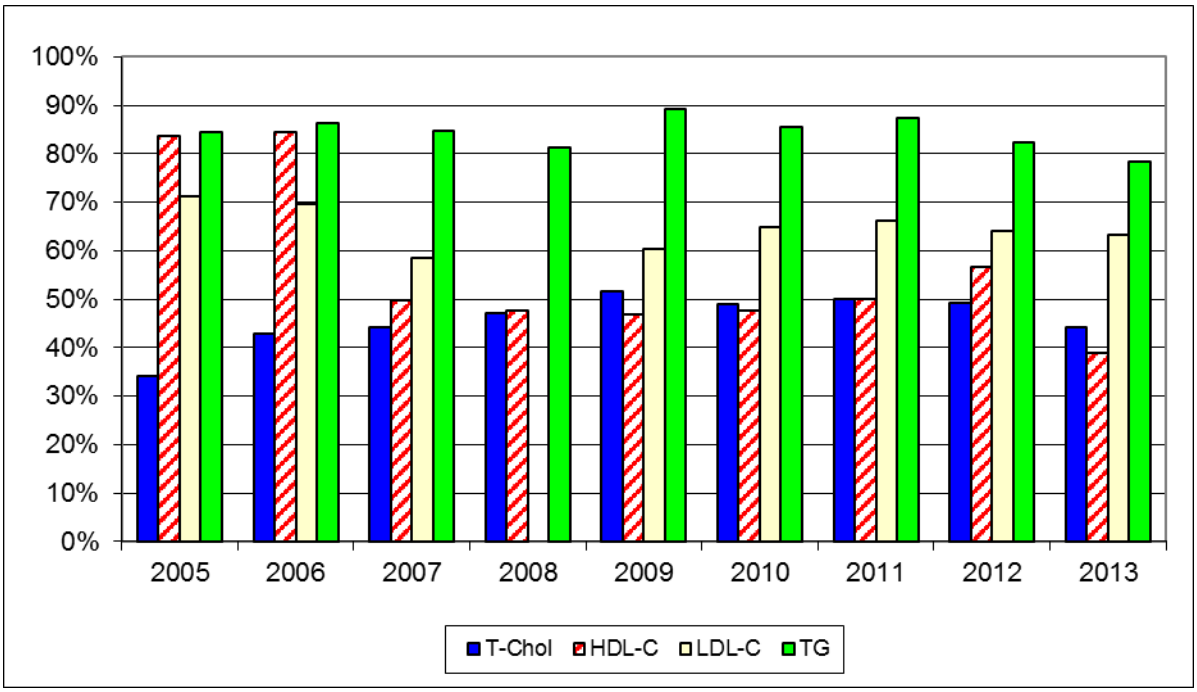
Fig 7L-1: Lipids



MOH 2/2006 guidelines for high risk groups were used to assess the proportion of patients with optimized levels:

- cholesterol (<4.1 mmol/l)
- HDL-cholesterol (>=1.0 mmol/l)
- LDL cholesterol (<2.6 mmol/l)
- TG (<2.3 mmol/l)

Fig 7L-2: Percentage of patients achieving target levels as recommended by MOH guidelines 2006



The percentage of patients achieving MOH targets for TG (<2.3 mmol/l) remains quite high 77.2%. However, for LDL cholesterol (<2.6 mmol/l) it was 62%. Only around less than 50% of the patients achieved the other targets – total cholesterol (<4.1 mmol/l 43.7% and HDL-cholesterol (>=1.0 mmol/l) 38.3%,

The proportion of patients on drug therapy has increased to 78% (209/268). HMG-CoA reductase inhibitors were the most commonly used drug (96.6%),

M. HEPATITIS SEROPOSITIVITY

6.0% are hepatitis B carriers, 7.1% are anti-HCV positive for Hepatitis C antibody. Four patients (1.7%) had received interferon treatment and HCV PCR was tested negative. Two patients (0.7%) are both anti-HCV and HepBsAg positive.

Table 7M-1 : Hepatitis Rates

	2005	2006	2007	2008	2009	2010	2011	2012	2013
HepB only	5.2%	6.2%	6.7%	6.4%	6.5%	6.3%	4.5%	6.4%	6.0%
HCV only	9.8%	10.6%	9.1%	8.7%	8%	7.7%	4.9%	8.5%	7.1%
HepB & HCV	1.7%	1.2%	1.2%	1.2%	1%	1%	1%	0.9%	0.7%

VACCINATION

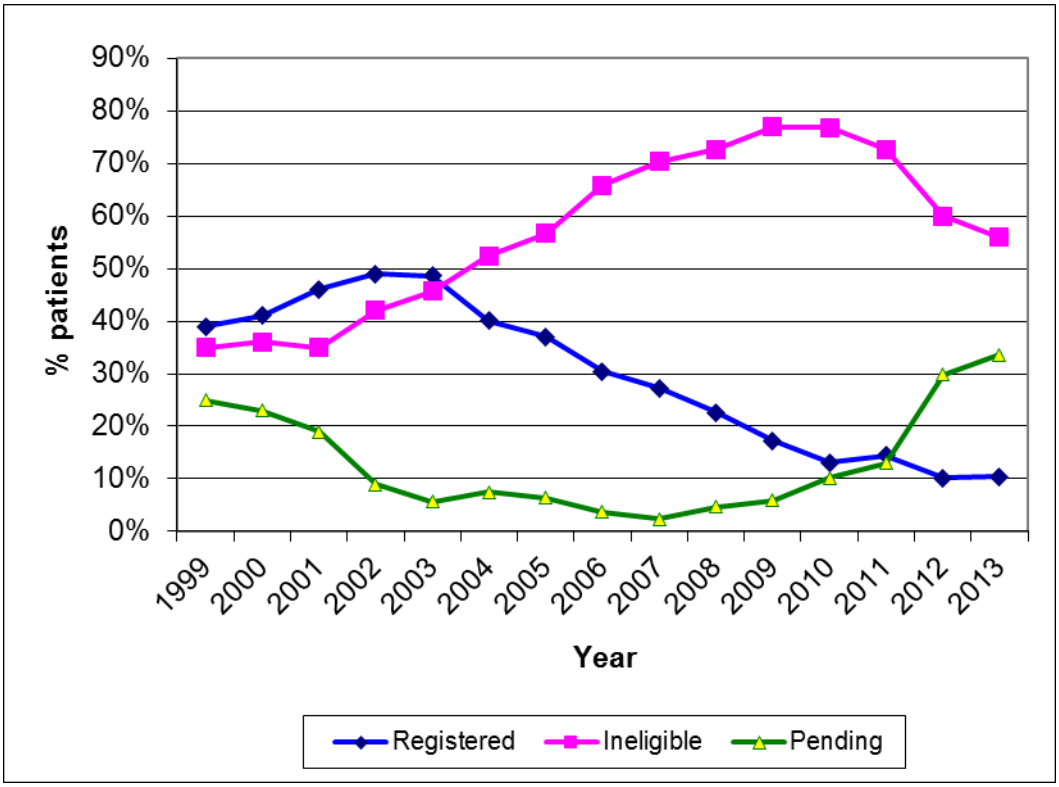
Hepatitis B

Thirty-one (15.4%) non immune patients with Hepatitis B antibody <10 were vaccinated and 12 (6%) patients were advised to be vaccinated. Financial assistance was extended to 9 needy patients

N. TRANSPLANT WAITING LIST

Only 28 patients (10.4%) are on the waiting list. More patients (91) have not been assessed with the larger influx of new cases this year. The number of ineligible patients grow as KDF takes in more patients with comorbidities since admission criteria was relaxed.

Fig 7N-1: Proportion of patients on the Transplant Waiting List



8. CONCLUSION

This year, we have had a large influx of new patients bringing along with them problems more unique to the newly initiated patients such as securing a permanent vascular access, more frequent hospital visits and medication titration.

As before, we found high hospitalization rates among the diabetics and it remains a challenge to manage these patients who not only require medical care but are in the lower socioeconomic strata.

It is obvious that focus of care for these patients will continue to change as time progresses.

We would like to thank all those who participated in the care of the patients.

A/PROF CHOONG HUI LIN
MEDICAL DIRECTOR

PERITONEAL DIALYSIS PROGRAMME

2013

1. EXECUTIVE SUMMARY (PD)

The Peritoneal Dialysis Centre of the Kidney Dialysis Foundation is located at the Ghim Moh Centre and the programme started on 1 July 2003. The dialysis service was formerly contracted out to a dialysis provider but since 1 January 2010 the programme has been directly administered by KDF.

This report covers medical data collated at the end of 2013.

Demographics: There were 38 patients on the PD programme as of 31 Dec 2013. Six patients joined the programme (NUH 5, SGH 1).
The mean age of the prevalent patients was 56.3 ± 13.3 years; 13 (34.2%) were male, 25 (65.8%) female; Chinese - 31, Malay - 7. Twenty-seven were on CAPD and 17 on APD. The major cause of end-stage renal failure in new patients was diabetic nephropathy (33.3%). In the existing patients, the major cause of end-stage renal failure was chronic glomerulonephritis (no biopsy) which accounted for 36.8% of the cases. Diabetic nephropathy was second and present in 21.1% of the patients. The age of entry into the programme was 53±19.5 years.

Deaths and Withdrawals: There were 7 deaths and 5 withdrawals. Of the 5 withdrawals, two received a kidney transplant and three were transferred to hemodialysis because of PD-related infections. The commonest causes of death were infections (57.1%) and cardiac-related deaths (14.3%)
The death rate was 14% based on total number of patients in the year and the mean age at death was 59.3 ± 11.4 years.

Hospitalisations: 58% of the patients were admitted in the year. The admission rate was 1.30 episodes per patient year or 17.9 days per patient year. The diabetic patients had higher rates than the non-diabetic patients. PD related admissions accounted for 12.5% of all admissions.

Dialysis Parameters
Dialysis Adequacy: The total KT/V was 2.19 ± 0.42 with 92.3% of the patients meeting the minimum target of 1.7.
Anaemia: The mean haemoglobin was 10.7 ± 1.8 g/dl with 86.8% on erythropoietin.
Serum Albumin: There has been an improvement in serum albumin levels with a mean of 35.9 ± 3.3g/L. 2.7% were below 30 g/L. Seventeen patients received a subsidy for protein supplements.
Mineral Metabolism: The mean corrected serum calcium was 2.4 ± 0.8 mmol/L, serum phosphate 1.63 ± 0.6 mmol/L and iPTH 58.4 ± 46.8 pmol/L. All the patients were on calcium-based phosphate binders; 6 (16.7%) were on Lanthanum carbonate and 4 (11.1%) were on Sevelamer.
Lipid profiles: The mean LDL cholesterol was 2.5 ± 0.68 mmol/L and triglyceride 2.3 ± 2.9 mmol/L. The mean HDL cholesterol level was 1.3 ± 0.4 mmol/L.

Transplant Waiting List: 18.4% of the patients were on the National Transplant waiting list while the majority was medically not eligible for transplantation or pending assessment.

PERITONEAL DIALYSIS PROGRAMME

1. STAFFING

MEDICAL

The Medical Director (Peritoneal Dialysis) and volunteer doctor, Dr Tan Seng Hoe (on alternate months) continue to review patients monthly. Patients are reviewed once in 6 months following their routine blood investigations. The patients also go for follow-up with their primary physicians in restructured hospitals every 6 months or less. Urgent medical cover has been arranged with family physicians working in the vicinity using the same clinics as those arranged for the hemodialysis patients.

NURSING

The PD programme is managed by PD Clinical Nurse Fan Fung Yin, Florence with assistance from Patient Services Senior Nurse Clinician Ms Lay Kwee Chin, Clinical Nurse Ms Sunitha D/O Silvanathan and Clinical Coordinator Ms Theresa Soh. Baxter Healthcare continues to provide service in doing home visits. Fresenius Medical Care provide home visit to patients who are on Fresenius system.

DOCTOR'S REVIEW AND DIET COUNSELLING

Patients are counselled on their blood tests results and diet by both the doctor and PD nurse when they come for review or for procedures.

PATIENT WELFARE

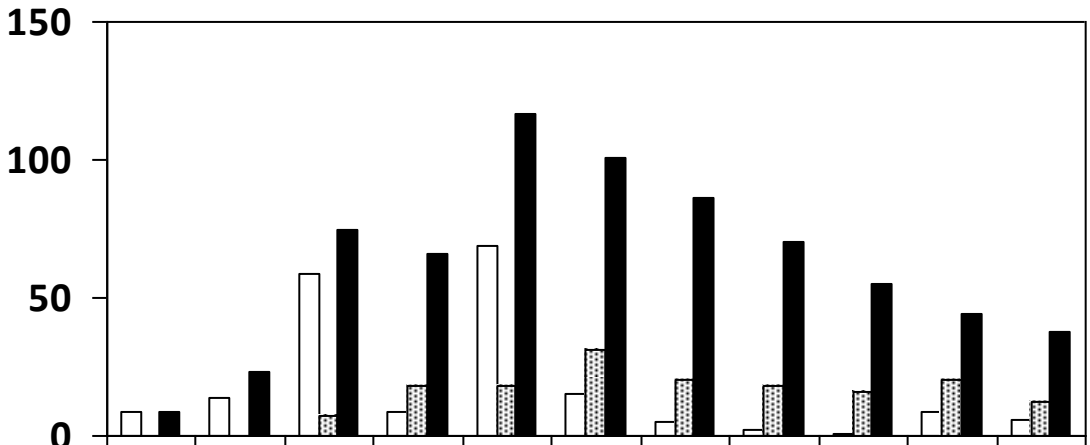
Patients continued to receive subsidies for their dialysis and medications (erythropoietin, Lanthanum carbonate and Bene protein supplements) on a case to case basis. Welfare Officer, Ms Sandy Lim left in May 2013 and taken over by Mr Jeffrey Loy who reviews and recommends the fee revision on an annual basis.

2. PATIENT POPULATION

There were 38 patients on the PD programme as of 31 December 2013. A total of six patients (5 from NUH, 1 from SGH) were accepted into the PD programme during the period of 1 Jan – 31 Dec 2013.

During the same period of 1 Jan – 31 Dec 2013, 12 patients exited the programme; there were 3 transfers to haemodialysis, 7 deaths and 2 transplants.

Fig 1: Patient Stock and Flow



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
□ Entry	9	14	59	9	69	15	5	2	1	9	6
▨ Exit	0	0	7	18	18	31	20	18	16	20	12
■ Total	9	23	75	66	117	101	86	70	55	44	38

Table 1: Source of Referral

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SGH	7	12	22	2	68	15	5	1	0	7	1
NUH	2	2	35	6	0	0	0	1	0	1	5
Private / TTSH	0	0	2	1	1	0	0	0	0	1	-
AH	-	-	-	-	-	-	-	-	1	-	-
Total Entries	9	14	59	9	69	15	5	2	1	9	6

Patient characteristics

The mean age of the existing 38 patients was 56.3 ± 13.3 years, with a continued preponderance of females [Male: 13 (34.2%), Female: 25 (65.8%)]. The ethnic distribution was similar to the general population. The mean age at entry of the six new patients was 53 ± 19.5 years; 1 male, 5 female. Twenty-one patients were on CAPD and 17 on APD. The proportion of patients on APD was 44.7% which is slightly higher than the previous year of 38.6% of the PD population. The main cause of end-stage renal failure in the PD programme was chronic glomerulonephritis (36.8%) with diabetic nephropathy the second commonest cause, making up 21% of the existing patients.

Figure 2: Modality of PD

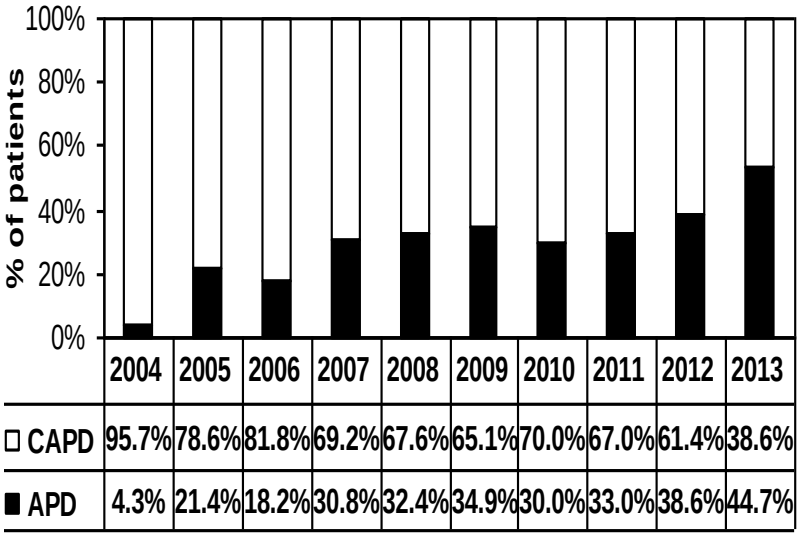


Table 2: Gender of new patients

	2007		2008		2009		2010		2011		2012		2013	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Male	40	58.0	5	33.3	3	60.0	1	50.0	0	0	3	33.3	1	16.7
Female	29	42.0	10	66.7	2	40.0	1	50.0	1	100	6	66.7	5	83.3
Total	69	100	15	100	5	100	2	100	1	100	9	100	6	100

Table 3: Gender of prevalent patients

	2007		2008		2009		2010		2011		2012		2013	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Male	57	48.7	45	44.6	41	47.7	28	40.0	21	38.2	16	36.4	13	34.2
Female	60	51.3	56	55.4	45	52.3	42	60.0	35	61.8	28	63.6	25	65.8
Total	117	100	101	100	86	100	70	100	55	100	44	100	38	100

Table 4: Ethnic distribution of new patients

	2007		2008		2009		2010		2011		2012		2013	
	n	**%**	**n**	**%**	**n**	%	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chinese	59	85.5	12	80.0	4	80.0	1	50	1	100	6	66.7	3	50
Malay	7	10.1	1	6.7	1	20.0	1	50	0	0	2	22.2	3	50
Indian	2	2.9	2	13.3	0	0	0	0	0	0	1	11.1	0	0
Others	1	1.4	0	0	0	0	0	0	0	0	0	0	0	0
Total	69	100	15	100	5	100	2	100	1	100	9	100	6	100

Table 5: Ethnic distribution of prevalent patients

	2007		2008		2009		2010		2011		2012		2013	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chinese	90	76.9	76	75.2	64	74.4	52	74.3	41	74.5	37	84.1	31	81.6
Malay	22	18.8	18	17.8	16	18.6	15	21.4	13	23.6	6	13.6	7	18.4
Indian	4	3.4	7	6.9	6	7.0	3	4.3	1	1.8	1	2.3	0	0
Others	1	0.9	0	0	0	0	0	0	0	0	0	0	0	0
Total	117	100	101	100	86	100	70	100	55	100	44	100	38	100

Table 6: Mean age at entry into programme

Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Mean age (years)	59	56	57	44	62.4	65	54	53
SD	13.9	11.6	11.7	11.9	8.1	-	14.7	19.5

Table 7: Mean age of existing patients

Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Mean age (years)	54	55	54	54	56	54	52	56.3
SD	11.3	11	10.7	10	10.9	10.7	11.3	13.3

Table 8: Etiology of end-stage renal disease in new patients

	2007		2008		2009		2010		2011		2012		2013	
Etiology	n	%	n	%	n	**%**	n	%	n	%	n	%	n	%
Chronic GN (no biopsy)	19	27.5	4	30.8	1	20.0	-	-	-	-	3	33.3	1	16.7
IgA nephropathy	4	5.8	-	-	-	-	-	-	-	-	1	11.1	1	16.7
SLE	2	2.9	-	-	-	-	-	-	-	-	-	-	-	
Focal sclerosing GN	1	1.4	-	-	-	-	-	-	-	-	-	-	-	
Drug induced GN	-	-	-	-	-	-	-	-	-	-	-	-	-	
Membranous GN	-	-	-	-	-	-	-	-	-	-	-	-	-	
Diabetic nephropathy	33	47.8	9	60.0	3	60.0	2	100.0	1	100.0	4	44.5	2	33.3
PCKD	3	4.3	-	-	-	-	-	-	-	-	-	-	-	
Renal calculi	-	-	-	-	-	-	-	-	-	-	-	-	-	
Renovascular disease	-	-	-	-	-	-	-	-	-	-	-	-	-	
TB Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	
Others	5	7.2	2	13.13	1	20.0	-	-	-	-	-	-	-	
Unknown	2	2.9	-	-	-	-	-	-	-	-	1	11.1	2	33.3
Total	**69**	**100.0**	**15**	**100.0**	**5**	**100.0**	**2**	**100.0**	**1**	**100.0**	**9**	**100.0**	**6**	**100.0**

Table 9: Etiology of end-stage renal disease in existing patients

	2007		2008		2009		2010		2011		2012		2013	
Etiology	n	%	n	%	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Chronic GN (no biopsy)	30	25.6	30	29.7	28	32.6	24	34.3	19	34.5	18	40.9	14	36.8
IgA nephropathy	9	7.7	8	7.9	6	7	5	7.1	4	7.3	3	6.8	4	10.5
SLE	2	1.7	2	2.0	2	2.3	2	3.0	2	3.6	2	4.5	1	2.6
Focal sclerosing GN	2	1.7	2	2.0	2	2.3	1	1.4	1	1.8	1	2.3	1	2.6
Drug induced GN	1	0.9	1	1.0	1	1.2	-	-	-	-	-	-	-	
Diabetic nephropathy	53	45.3	39	38.6	30	34.9	24	34.3	17	30.9	11	25	8	21.1
PCKD	5	4.3	4	3.9	4	4.7	4	5.7	4	7.3	2	4.5	2	5.3
Renal calculi	1	0.9	1	1.0	1	1.2	1	1.4	1	1.8	1	2.3	1	2.6
Renovascular disease	-	-	-	-	-	-	-	-	-	-	-	-	-	
TB Kidney	-	-	-	-	-	-	-	-	-	-	-	-	-	
Others	5	4.3	6	5.9	5	5.8	4	5.7	3	5.5	2	4.5	2	5.3
Unknown	9	7.7	8	7.9	7	8.1	5	7.1	4	7.3	4	9.2	5	13.2
Total	**117**	**100.0**	**101**	**100.0**	**86**	**100.0**	**70**	**100.0**	**55**	**100.0**	**44**	**100.0**	**38**	**100.0**

DEATHS / TRANSFERS AND SURVIVAL ANALYSIS

There were 7 deaths and 5 withdrawals in 2013. The causes of death are shown in Table 10 and the commonest causes of death were infections (57%), one cardiac-related death (14.3%), one unknown cause and one died at home. Of the four deaths from infection, two were PD-related (one peritonitis and one exit site infection) and the other two non-PD related (one from pneumonia and the other from cellulitis of the leg).

The reasons for withdrawal from PD are shown in Table 11. Three patients were transferred to hemodialysis due to peritonitis. Two patients received a renal transplant.

The death rate was 14% based on total number of patients in the year. The mean age at death in 2013 was 59.3 ± 11.4 years.

Table 10: Cause of Death

	2007		2008		2009		2010		2011		2012		2013	
Cause of Death	n	%	n	%	n	%	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Acute Myocardial Infarction	1	7.6	10	41.7	1	7.2	1	9.1	1	11.1	1	8.3	1	14.3
Other Cardiac	-	-	2	8.3	5	35.7	2	18.2	-	-	2	16.7	-	-
Cerebrovascular Accident	-	-	-	-	-	-			-	-	-	-	-	-
Infections	4	30.7	5	20.8	3	21.4	3	27.2	4	44.4	3	25.0	4	57.1
Liver Failure	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malignancy	-	-	1	4.2	-	-	1	9.1	-	-	-	-	-	-
Accidental	-	-	-	-	-	-	-	-	-	-	1	8.3	-	-
Bleeding from Gastro-intestinal Tract	1	7.6	-	-	-	-	-	-	-	-	-	-	-	-
Died at Home	3	23.4	5	20.8	3	21.4	2	18.2	1	11.1	2	16.7	1	14.3
Others	4	30.7	1	4.2	2	14.3	2	18.2	3	33.4	3	25.0	1	14.3
Total	**13**	**100.0**	**24**	**100.0**	**14**	**100.0**	**11**	**100.0**	**9**	**100.0**	**12**	**100.0**	**7**	**100.0**
Death Rate	**9.6%**		**17.4%**		**13.2%**		**12.5%**		**12.7%**		**18.8%**		**14%**	

Table 11: Reason of Withdrawal

	2007		2008		2009		2010		2011		2012		2013	
Reason of Withdrawal	n	%	n	%	n	%	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
PD related Infection	5	100	5	71.4	3	50	5	71.4	4	57.1	5	62.5	3	60
Technical Reason	-		-	-	-	-	2	28.6	1	14.3	-	-	-	-
Elective transfer to HD	-	-	1	14.3	-	-	-	-	-	-	-	-	-	-
Transplant	-	-	1	14.3	3	50	-	-	2	28.6	1	12.5	2	40
Others	-	-	-	-	-	-	-	-	-	-	*2	25	-	-
Total	**5**	**100**	**7**	**100**	**6**	**100**	**7**	**100**	**7**	**100**	**8**	**100**	**5**	**100**

* Patients withdrew to be on palliative care.

HOSPITALISATIONS

There were 56 admissions in 50 patients and 58% of the patients in the PD programme were admitted in the year. Five patients (17.2%) had three or more admissions during the year. The admission rate was 1.30 episodes per patient year or 17.9 days per patient year. The diabetic patients had higher percentage who were admitted compared to the non-diabetic patients (61.1% vs 56.3 %), the diabetic patients had a higher episode per patient year rate (1.58 vs 1.15) and higher days of hospitalization per patient year (26.7 vs 13.1). PD-related problems accounted for 12.5 % of the total admissions, of which 10.7% of the total admissions were for PD-related infections. Other non-PD related infections accounted for 12.5% of the admissions.

When compared to the previous year (2012), the rates of hospitalization were comparable.

Table 12: Hospitalisations

HOSPITALISATION	**ALL**		**DM**		**NON-DM**	
	2012	**2013**	2012	**2013**	2012	**2013**
Number of patients ever in prog	64	**50**	27	**18**	37	**32**
Total patient years	52.8	**43**	21.2	**15.2**	31.6	**27.8**
Number of patients ever admitted	39	**29**	16	**11**	23	**18**
Admission episodes	73	**56**	33	**24**	40	**32**
Admission days	913	**769**	491	**406**	422	**363**
Days hospitalized						
PD related – technical	15	**5**	0	**5**	15	**0**
- infection	234	**127**	69	**17**	165	**110**
Other Infections	211	**124**	171	**109**	40	**15**
Others	453	**513**	251	**275**	202	**513**
% patients ever admitted	60.9	**58**	59.2	**61.1**	62.2	**56.3**
Episodes per patient year	1.38	**1.30**	1.56	**1.58**	1.27	**1.15**
Days per patient year	17.3	**17.9**	23.2	**26.7**	13.4	**13.1**
Days per patient year						
PD related – technical	0.28	**0.12**	0.0	**0.32**	0.47	**0.0**
- infection	4.43	**2.95**	3.25	**1.12**	5.22	**3.95**
Other Infections	4.00	**2.88**	8.06	**7.17**	1.27	**0.54**
Others	8.58	**11.93**	11.84	**18.09**	6.39	**18.45**
% of admissions						
PD related - technical	1.4	**1.8**	0.0	**4.2**	2.5	**0.0**
- infections	20.5	**10.7**	24.2	**8.3**	17.5	**12.5**
Other Infections	24.7	**12.5**	39.4	**20.8**	12.5	**6.3**
Others	53.4	**75**	36.4	**66.7**	67.5	**81.2**

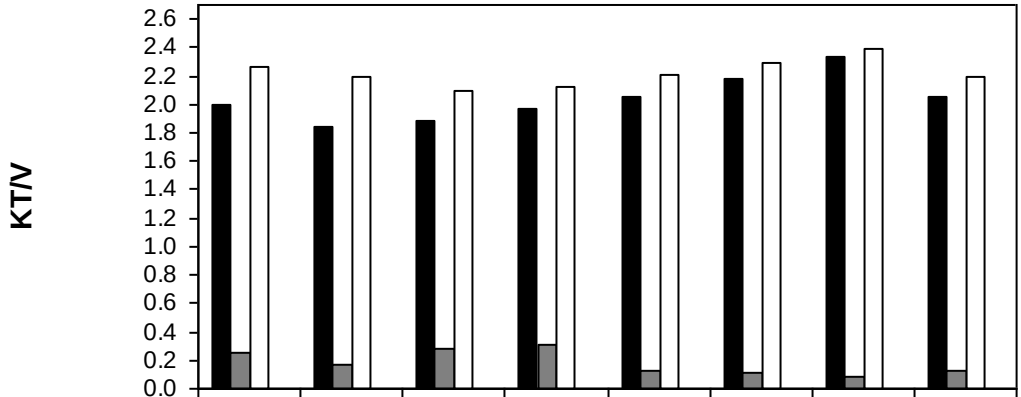
Hospitalisations during the period Jan-Dec 2013 were analysed and expressed as days hospitalized per patient year of dialysis programme.

DIALYSIS PARAMETERS

Dialysis Adequacy

Dialysis adequacy is assessed using the total KT/V and is measured 6 monthly. The minimum target total KT/V is 1.7. The total KT/V (which is the sum of the dialysate and residual KT/V) of the cohort was 2.19 ± 0.42. It is encouraging to note that the dialysate KT/V (2.25 ± 0.35) is also above the minimum target and this implies that no change in the dialysis prescription would be required when the patient loses residual renal function. Three patients did not achieve the minimum target of 1.7; of these, two had their PD prescriptions optimized and repeat KT/Vs were 2.25 and 2.06 (in 2014). The third patient was not keen to alter her prescription.

Fig 3: KT/V



	2006	2007	2008	2009	2010	2011	2012	2013
■ Dialysate	2.00	1.84	1.89	1.97	2.06	2.18	2.33	2.05
SD	0.4	0.34	0.39	0.5	0.35	0.37	0.37	0.35
▒ Residual	0.26	0.17	0.28	0.31	0.13	0.11	0.08	0.12
SD	0.3	0.25	0.32	0.43	0.34	0.25	0.2	0.39
□ Total KT/V	2.27	2.2	2.09	2.12	2.21	2.29	2.39	2.19
SD	0.5	0.43	0.41	0.49	0.44	0.33	0.38	0.42
% achieving KT/V 1.7	90.0%	82.5%	74.6%	81.9%	92.2%	100.0%	100.0%	92.3%

Table 13: KT/V

	2007	2008	2009	2010	2011	2012	2013
N	40 (11 not done)	71 (30 not done)	83 (3 not done)	64 (6 not done)	50 (5 not done)	39 (7 not done)	38
Total KT/V	2.20 ± 0.43	2.09 ± 0.41	2.12 ± 0.49	2.21 ± 0.44	2.29 ± 0.33	2.39 ± 0.38	2.19 ± 0.42
Dialysate KT/V	1.84 ± 0.34	1.89 ± 0.39	1.97 ± 0.5	2.06 ± 0.35	2.18 ± 0.37	2.33 ± 0.37	2.05 ± 0.35
Residual KT/V	0.17 ± 0.25	0.28 ± 0.32	0.31 ± 0.43	0.13 ± 0.34	0.11 ± 0.25	0.08 ± 0.2	0.12 ± 0.39
% patients with KT/V ≥ 1.7	82.5 (7/40 <1.7)	74.6 (18/71<1.7)	81.9 (15/83 <1.7)	92.2 (5/64 <1.7)	100.0	100.00	92.1 (3/38<1.7)

Peritonitis

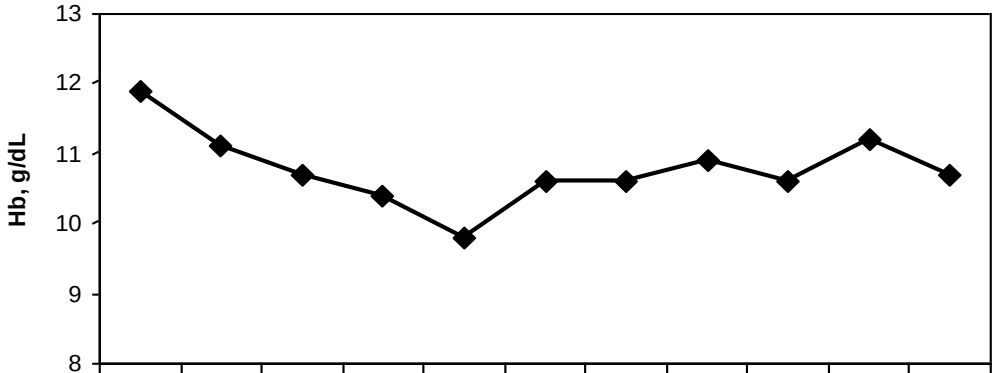
Patients who develop peritonitis are treated at their primary hospitals. As such, the KDF PD programme only captures data of hospitalisations for peritonitis.

Ten patients (6 CAPD, 4 APD) were admitted for peritonitis during the period of 1 Jan 2013 to 31 Dec 2013. Two resolved, 3 were transferred to hemodialysis and two died from sepsis resulting from the peritonitis.

Anaemia

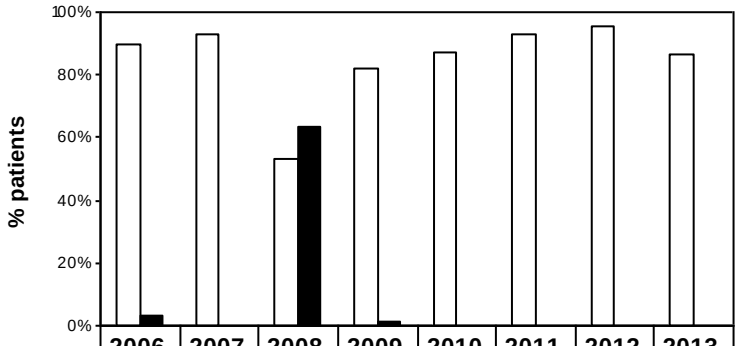
The mean haemoglobin was 10.7 ± 1.8 g/dl with 86.8% (33/38) of the patients receiving erythropoietin (EPO). The mean dose of EPO was 89.6 ± 43.8 U/kg BW/week (range 42.8 – 98.5 U/kg BW/week). The mean haemoglobin has remained stable except for the slight dip to 9.8 g/dl in 2007. All patients with a haemoglobin less than 10 g/dl were on EPO.

Fig 4: Mean Haemoglobin Level



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	11.9	11.1	10.7	10.4	9.8	10.6	10.6	10.9	10.6	11.2	10.7
SD	2.6	1.8	1.8	1.6	2.0	1.9	1.9	1.8	1.9	1.9	1.8

Fig 5: Percentage of patients on EPO



	2006	2007	2008	2009	2010	2011	2012	2013
□ Total % on EPO	90.0%	93.0%	53.0%	82.0%	87.1%	92.7%	95.3%	86.8%
■ < 10, not on EPO	3.3%	0.0%	63.6%	1.0%	0.0%	0.0%	0.0%	0.0%

Table 14: Haemoglobin and Use of EPO

Hb (g/dl)	2007		2008		2009		2010		2011		2012		2013	
N	43		83*		86		68		54		43		38	
Mean ± SD	9.8 ± 2.0		10.6 ± 1.9		10.6 ± 1.9		10.9 ± 1.8		10.6 ± 1.9		11.2 ± 1.9		10.7 ± 1.84	
< 10 not on EPO	0	0	14	16.9%	1	1.0%	0	0%	0	0%	0	0%	0	0%
< 10 on EPO	22	51%	18	21.7%	32	37.0%	20	29.4%	20	37.0%	10	23.3%	10	26.3%
> 10 not on EPO	3	7%	25	30.1%	14	16.0%	6	8.8%	4	7.4%	2	4.7%	5	13.2%
> 10 on EPO	18	42%	26	31.3%	39	45.0%	42	61.8%	30	55.6%	31	72.1%	23	60.5%

* 18 patients with no data (2008)

Serum Albumin

Although the mean serum albumin (35.9 ± 3.3g/L) of the prevalent patients remains below normal (37 g/L), it has improved compared to the previous years and this can be attributed to the use of a protein supplement (Beneprotein) provided through a subsidy programme. Compared to the previous years, the percentage of patients with a serum albumin of less than 30 g/L was also much reduced (2.7%).

The protein supplement (Beneprotein) subsidy program was started in October 2011 and there are currently 17 patients on Beneprotein as at end December 2013.

Table 15: Serum albumin

Albumin (g/L)	2007	2008	2009	2010	2011	2012	2013
N	46	82	84*	70*	54	43	37
Mean ± SD	30.3 ± 3.9	30.9 ± 4.3	30.4 ± 4.4	30.9 ± 4.2	31.3 ± 3.8	31.7 ± 3.5	35.9 ±3.3
% < 37 g/L	58.7	52.4	93.0	88.6	96.3	90.7	54.1
% < 30 g/L	39.1	40.2	43.0	42.9	29.6	25.6	2.7

* No results in 2 patients

Mineral Metabolism

The mean corrected serum calcium was 2.4 ± 0.18 mmol/L and the mean serum phosphate was 1.63 ± 0.6 mmol/L (34.2% of patients had a serum phosphate > 1.78 mmol/L). All the patients were on calcium supplements (calcium acetate 77.8%, calcium carbonate 19.4%) and 6 patients (16.7%) were also on Lanthanum carbonate (non-calcium phosphate binder) and 4 patients (11.1%) on Sevelamer. As Lanthanum is costly, the patients received a subsidy for the medication.

The mean iPTH level was 58.4 ± 46.8 pmol/L with only 18.4% of the patients falling within the limits of 16.5-33 pmol/L. The 2003 KDOQI guidelines recommend that the iPTH in dialysis patients (CKD Stage 5) should be maintained within the range of 16.5 – 33 pmol/L. Hyperphosphatemia is a major factor contributing to mineral bone disease and the recent availability of Lanthanum will allow better control of the problem and avoid the need for surgical parathyroidectomy. One patient underwent a parathyroidectomy.

Table 16: Percentage of patients according to iPTH levels

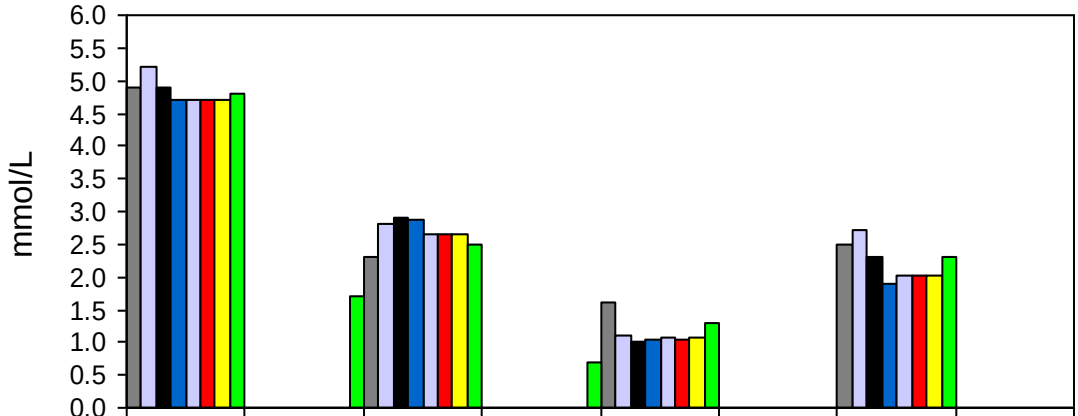
	2010		**2011**		**2012**		**2013**	
	N	%	N	%	N	%	N	%
<16.5	10	15.9	12	23.1	10	24.4	9	23.7
16.5-33.0	16	25.4	13	25.0	10	24.4	7	18.4
>33.0	37	58.7	27	51.9	21	51.2	22	57.9
Total	63*	100.0	52	100.0	41	100	38	100

*Date not available for 7 patients (2010)

Hyperlipidaemia

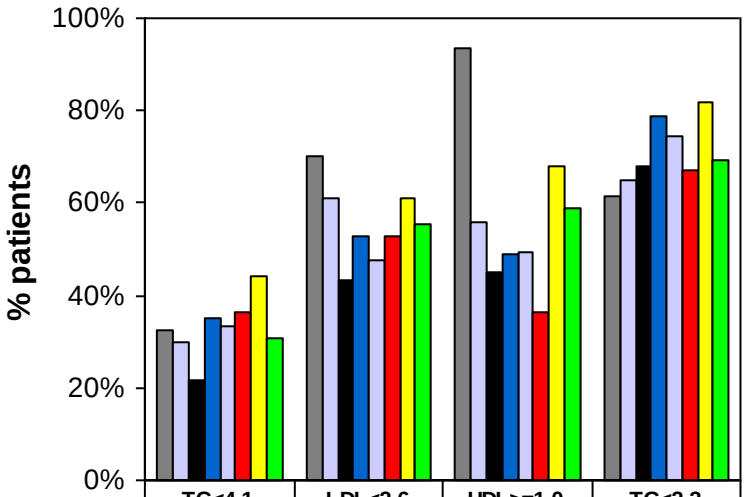
The lipid profile of the patients remained largely unchanged when compared to the previous years. The mean LDL cholesterol level was 2.5 ± 0.68 mmol/L with 55.6% of the patients achieving the recommended MOH guidelines for LDL cholesterol of < 2.6 mmol/L. The mean HDL cholesterol level was 1.3 ± 0.4 mmol/L and the mean triglyceride level was 2.3 ± 2.9 mmol/L. It remains encouraging to note that a large proportion of patients (69.4%) achieve the recommended MOH guideline for triglyceride levels.

Fig 6: Lipid profile



	Total Chol	SD	LDL	SD	HDL	SD	TG	SD
2006	4.9	1.4	2.3	1.1	1.6	0.7	2.5	2.2
2007	5.2	1.8	2.8	0.9	1.1	0.4	2.7	2.3
2008	4.9	1.1	2.9	0.8	1.0	0.4	2.3	2.0
2009	4.69	1.2	2.87	1.26	1.03	0.34	1.88	1.25
2010	4.7	1.2	2.64	1.06	1.08	0.34	2.02	1.44
2011	4.7	1.1	2.64	1.03	1.03	0.28	2.02	1.1
2012	4.7	1	2.65	0.83	1.08	0.41	2.02	1.6
2013	4.8	1.7	2.5	0.68	1.3	0.4	2.3	2.9

Fig 7: Lipid profile – Percentage achieving MOH target levels



	TC<4.1	LDL<2.6	HDL>=1.0	TG<2.3
2006	32.3%	70.3%	93.5%	61.3%
2007	30.0%	60.9%	55.8%	65.1%
2008	21.8%	43.2%	44.9%	67.9%
2009	35.0%	53.0%	49.0%	79.0%
2010	33.3%	47.6%	49.2%	74.6%
2011	36.3%	52.7%	36.3%	67.3%
2012	44.0%	61.0%	68.0%	82.0%
2013	30.6%	55.6%	58.7%	69.4%

TRANSPLANT WAITING LIST

Seven (18.4%) patients were registered on the transplant register. Twenty-two patients (57.9%) were not eligible for transplant for reasons including exceeding the age limit of 60 years* (10/38 patients, 26.3%), two patients opted out and seropositivity for Hepatitis B or C (2 patients). Seven patients were pending assessment.

*The age limit of 60 years was recently lifted and the patients now have to be reassessed for fitness for transplant.

Table 17: Transplant status

	2007		2008		2009		2010		2011		2012		2013	
N	117		101		86		70		55		44		38	
Registered	28	23.9%	19	18.8%	17	19.8%	17	24.3%	12	21.8%	13	29.5%	7	18.4
Not eligible	52	44.4%	63	62.4%	48	55.8%	35	50%	42	76.4%	28	63.6%	22	57.9
Opted out	2	1.7%	2	2%	2	2.3%	2	2.9%	1	1.8%	2	4.5%	2	5.3
Pending	35	29.9%	17	16.8%	19	22.1%	16	22.9%	0	0	1	2.3%	7	18.4

INTERIM HEMODIALYSIS

Three patients required interim hemodialysis (due to peritonitis) and were subsequently converted to permanent hemodialysis. Two of the patients were accepted into the KDF HD Programme and one went to a private dialysis centre.

3. ACTIVITIES OF THE PD CENTRE

Patient Activities

The PD patients participated in the following activities:

1. a Patient Education Seminar on “Exercise Made Easy” at HortPark on 24 November 2013, and a
2. a one-day social outing "Makan Makan Kampong Tour" to Johore on 21 January 2014.

4. CONCLUSION

The KDF PD Programme provides a complementary clinical service to patients from the public institutions. The patients in the Programme not only receive a subsidy but also receive 6 monthly clinical reviews by the KDF doctor, more frequent reviews by the PD Nurse and home visits. They also receive subsidies for expensive medications including erythropoietin, Lanthanum carbonate and Bene protein supplements.

Meeting dialysis targets remains a challenge in this group of patients as compliance is often difficult to track and they have multiple co-morbidities. However, dedicated personal care from the PD dialysis nurses has certainly added quality to the dialysis programme.

We would like to thank all who have contributed to the smooth running of the programme.

Dr Grace Lee Siew Luan
Medical Director (Peritoneal Dialysis)