South Western Sydney Area Health Services

RENAL DIALYSIS
STRATEGIC PLAN

2001 - 2006

Renal Dialysis Strategic Plan 2001 - 2006
January 2002

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1. Executive Summary

There continues to be significant growth in the demand for renal dialysis services. There is no indication that this will reduce significantly in the foreseeable future. As well as growing demand, a recent study by Cass et al (2001) indicates that there is significant variation in the standardised incidence of end stage renal disease (ESRD) in Australian capital cities. The Fairfield-Liverpool statistical sub-division (SSD) has the highest standardised incidence ratio (1.63) for ESRD of all Australian capital cities. The Canterbury-Bankstown SSD has the fourth highest standardised incidence ratio (1.34) of the 51 SSDs considered. As well as higher standardised incidence ratios, the two SSDs groupings had the most cases of ESRD in the Sydney metropolitan area.

This Plan has used two NSW Health methodologies to forecast the likely scenario for the Area. Due to the large variation in the endpoints that these models indicate, a mid point has been used to provide an indication of the potential demand. A review of the baseline in December each year is proposed as part of the Area and Area Renal Service taking a proactive position to this service. This will enable service development to be refined in relation to the actual growth that has occurred.

The Plan proposes the development of a number of dialysis units in the Area of a minimum of 10 chairs. 10 chair units offer efficiencies in relation to staffing and service provision. This would require expansion of Bankstown, full commissioning of Campbelltown and development of a new service at Fairfield. Liverpool Hospital capacity would need to be fully commissioned and further expansion allowed for.

Availability of and recruitment of suitable skilled staff will be an issue as services expand across NSW and Australia.

As well as the funding requirements that inpatient demand will create for the Area, the Area is also subject to a levy for the shortfall in home dialysis recurrent funding and may be subject to a further levy for any shortfall in home dialysis capital funding. As such, the Plan has attempted to identify the potential liability for the Area in this regard.

In addition, given the high cost of renal dialysis services and the projected growth, the *NSW Health Review of Renal Dialysis Services in NSW* has recommended that Area Health Services should explore opportunities for private sector collaboration in both the capital development and provision of renal dialysis services.

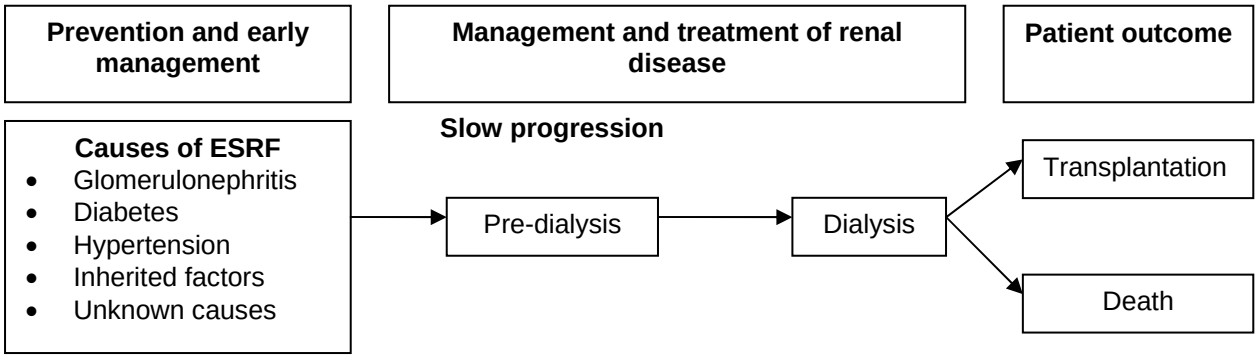
2. Introduction

Growth in demand for renal dialysis services is both a national and international trend. In Australia, dialysis procedures are the most common reason for admission to public hospitals. A recent study by Cass et al in 2001 (Appendix 1) indicates that the Fairfield-Liverpool statistical sub-division has the highest standardised incidence ratio (1.63) for ESRD of all Australian capital cities. Cass concludes that socio-economic factors may be important determinants of the risk of developing ESRD.

Whilst it is acknowledged that the provision of renal medicine services encompasses a broader service delivery strategy, this Plan addresses adult renal dialysis services only, and as such, has attempted to identify a five year strategic response to the issue of providing renal dialysis services for the projected population of South Western Sydney Area Health Service (SWSAHS).

Paediatric dialysis is a highly specialised service that can only be provided and managed by paediatric nephrologists, who in Sydney, are located at Sydney Children's Hospital, Randwick and The Children's Hospital, Westmead. Equipment and management is specific for paediatric utilisation.

There is a range of auto-immune, infectious, systemic and genetic conditions associated with the development of End Stage Renal Failure (ESRF). ESRF is defined as an irreversible condition characterised by greater than 95% deterioration in renal function. The pathway is demonstrated below:



Dialysis and/or renal transplantation are the two treatment options for ESRF. There are two forms of dialysis. These can be provided in hospital or home settings, or at a "satellite" or "ambulatory" centre which may not be located within a hospital but does have skilled nursing supervision.

The two types of dialysis are as follows:

- Haemodialysis – involves passing blood into a dialyser (filter) where an artificial membrane between the blood and dialysing fluid allows the passage of chemicals between the two fluids. This process corrects the chemical balance in the blood which is then returned to the patient. Haemodialysis is generally performed three times a week via an arteriovenous fistula or an implanted graft.

- Peritoneal dialysis (PD) – involves insertion of dialysing fluid into the peritoneal cavity via a peritoneal catheter, the fluid is allowed to dwell for a period of time, drained out and replaced with fresh fluid. The procedure may be undertaken on an intermittent (IPD) or continuous ambulatory (CAPD) basis. When the procedure is undertaken with the use of a cycler machine, it is referred to as automated peritoneal dialysis (APD). PD has a role as the first treatment of choice. In the early stages of renal failure some renal residual function is left and helps to contribute to the adequacy of the dialysis. However with usage of the peritoneal membrane and decline in renal function over time, haemodialysis becomes inevitable unless the patient receives a renal transplant.

3. Policy Context

The development of the *SWSAHS Renal Dialysis* Plan has been guided by the *SWSAHS Strategic Directions Statement* and *1999 Area Operations Plan.* Other reports and guidelines that have been considered include the *NSW Health Review of Renal Dialysis Services Final Report, April 2001* and draft CARI (Caring for Australians with Renal Impairment) Guidelines.

The four principal goals for NSW Health and SWSAHS of healthier people, fairer access, quality health care and better value, have been considered in the development of this plan. As part of a commitment to achieving “Better Health, Good Health Care” SWSAHS has identified the following key challenges:

- Working with our community;
- Ensuring the people in SWS access health services according to need;
- Working in partnership with other agencies to improve health;
- Developing an effective Health service and a focus on health outcomes;
- Becoming a teaching/learning organisation;
- Making the best use of and fairly allocating incoming resources;
- Attracting, developing and retaining the best staff.

These key challenges have guided the development of the objectives for renal dialysis services in SWSAHS and are reflected in the recommended strategies and priorities outlined in this Plan.

4. Objectives for SWSAHS Renal Dialysis Service

The objectives for renal dialysis services in SWS are consistent with the Strategic Directions for Health. These objectives are listed under the Goals that they address.

Goal 1: Healthier People

- To promote changes in health related behaviour which are conducive to preventing or delaying end stage renal failure in the SWS community.

Goal 2: Fairer Access

- To ensure that all patients requiring renal dialysis services who live in SWS have equitable access to care for their illness; and

- To ensure that the care is provided in a manner which is appropriate to the needs of community groups and individuals within the Area.

Goal 3: Quality and Safe Health Care

- To ensure that all SWS residents utilising renal dialysis services have access to optimally effective and safe care for their illness; and

- To stimulate research, education and training in renal dialysis services among medical, nursing, allied health and science students and graduates.

Goal 4: Better Value

- To ensure that renal dialysis services are delivered in the most efficient manner possible.

The NSW Health *1996 Review of Maintenance Renal Dialysis Services in NSW* and the *NSW Health Review of Renal Dialysis Services Final Report, April 2001* have been used to estimate future demand for renal dialysis services in SWSAHS as well as guide the proposed service development. The main recommendations of the *NSW Health Review of Renal Dialysis Services Final Report, April 2001* that have an impact on planning for renal dialysis services in SWSAHS are:

- The Department make available the results of the review of the projection model as a priority to assist in informing future planning and funding strategies;
- That trend data for renal dialysis services be monitored at a statewide and AHS level to facilitate effective clinical planning;
- That a statewide plan be developed for the location of satellite services appropriate to need;
- Nurse patient ratios be revised according to the ratio recommendations made in the Report;
- Skill mix to be adjusted to incorporate use of enrolled nurses and technicians where appropriate;
- The proposed networks work together to establish and conduct consistent training courses for nurses and technicians;
- Aboriginal patients be provided where appropriate with aboriginal liaison community support; and

- Consumer groups need to be represented on renal dialysis management groups to enable more active involvement in the development of policies regarding dialysis treatment and management.

5. Services Planning Context

5.1 Geography

SWSAHS provides dialysis services to people living in the seven local government areas of Bankstown, Liverpool, Fairfield, Campbelltown, Camden, Wollondilly and Wingecarribee. Combined they make up a geographical area of approximately 6237 square kilometres with a total population of 769,243. Suburban populations vary considerably ranging from the densely populated residential areas of Fairfield and Liverpool to the more rural townships of Wingecarribee and Wollondilly.

The geography of SWSAHS raises particular issues regarding access for dialysis treatment for patients. While home based dialysis is one treatment option, there are a significant number of patients who are required to travel to hospital or satellite centres at least three times per week. In addition, patients at a later stage of their illness, and who may be less well, are generally those required to travel. This may be less well tolerated and cause greater issues for the patient. While it is acknowledged that these patients will need to travel to an appropriate level service, the distances and time of travel should be minimised where possible.

5.2 Population

SWSAHS has recently passed Northern Sydney and South Eastern Sydney to become the most populous Area Health Service in NSW. 1996 ABS census data indicates that the intercensal population growth in SWS (8.4%) was higher than that for the whole of NSW (5.4%), particularly in Camden and Liverpool. Population projections indicate that by 2006 SWSAHS will have 840,680 people growing to 879,170 people by 2011.

The population projections for South Western Sydney indicate a growth of 25% between 1996 and 2016. As well as overall population growth, the proportion of elderly people in SWSAHS is projected to increase from 9.1% to 12.6% of the total population. The growth in the number of people from culturally and linguistically diverse backgrounds indicates that SWS is an increasingly multicultural region.

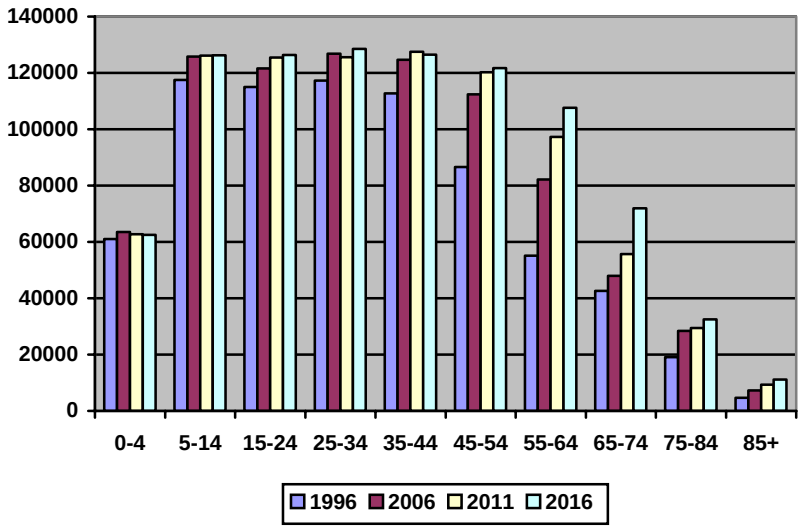
Projected Population Growth

Table 1 - Population projections by Sector (total population)

Sector	1998 ERP	2006	2011	2016
Bankstown	167,839	169,400	169,490	169,490
Fairfield	190,929	193,680	193,460	192,600
Liverpool	137,066	176,600	197,710	217,110
Macarthur	222,745	255,930	270,580	284,600
Wingecarribee	39,346	45,070	47,930	51,240
Total SWS	**757,916**	**840,680**	**879,170**	**915,040**

Source: Department of Health Population Projections for NSW Area Health Services March 2000

Figure 1 - Population projections by age group



Source: Department of Health Population Projections for NSW Area Health Services March 2000

As demonstrated in Figure 1, it is apparent that the age distribution of SWSAHS is shifting over time with a growing proportion of the total SWSAHS population aged 45 years and over. Rates of change for people 65 years and older are higher with growth in younger groups being relatively static over the same period.

This is relevant to dialysis services in SWSAHS as most new patients are in the 45 years and over age groups and most patients dialysing are in the 55-74 age groups. There is also a trend of more elderly patients, that is those aged 65 years and over, being accepted onto dialysis. Therefore as well as increasing incidence and prevalence, population groups most affected are increasing significantly in SWSAHS. Age also affects the type and location of dialysis method, for example, peritoneal dialysis is the main dialysis method in those less than 15 years of age whereas older patients may be more likely to require in-centre or satellite services.

5.3 Socioeconomic Factors

The demographic characteristics of SWS taken from the 1996 Census indicate the residents have more social disadvantage than other areas in NSW:

- Aboriginal or Torres Strait Islander descent (1.2% compared with 0.57% for the rest of Sydney). SWSAHS also has 25% of Sydney's Aboriginal population;
- 34.4% of the SWS population was overseas-born compared to 23% for the rest of NSW, with even higher rates in Fairfield (53.5%), Liverpool (35.1%) and Bankstown (33.2%) LGAs;
- 28.5% of the SWSAHS population is from a non English speaking background (NESB) compared to 15.7% for NSW. 36.5% of the population speak a language other than English at home compared to 18.1% for the rest of NSW);
- Unemployment (10.8% for SWSAHS compared with 8.8% for NSW);

- In relation to levels of education attained only 0.7% of the SWSAHS population had higher degree qualifications compared to 1.6% for NSW. 5.4% had post graduate diploma or bachelor degree qualifications compared to 9.3% in NSW;
- The SWSAHS population has a higher proportion of persons with incomes less than $31,200 (18.4% for SWSAHS compared to 16.9%for NSW) and a lower proportion of persons with incomes above $52,000 (2.6% for SWSAHS compared to 3.9% for NSW);
- Large population living in public housing with 10.1% for the SWSAHS population compared with 5.7% for NSW);
- 14% of households in SWS were sole parent households, 2% higher than NSW.
- 3.1% of the population received a disability support pension, 1.0% receive a carer's pension and 5.1% of the population are considered the Home and Community Care (HACC) target population.
- 21.6% of the population hold a Health Care Card, Pensioner Concession Card or a Commonwealth Seniors Health Card.

These characteristics raise particular issues such as:

- The incidence of renal failure;
- The ability of people to make the home modifications necessary for home dialysis where they are reliant on rental accommodation;
- People with low socio-economic status are less commonly able to dialyse at home;
- The need for interpreters and culturally appropriate information;
- Implications for the time taken for treatment and training of the patient and their carers where there are language barriers; and
- The ability to access appropriate clinical staff both early and on an ongoing basis.

There is good evidence that patients of lower socio-economic status have more renal disease and worse prognosis with renal disease. A study by Cass et al in 2001 of ANZDATA demonstrated that there is significant variation in the standardised incidence of ESRD within Australian capital cities. The Fairfield-Liverpool statistical subdivision has the highest standardised incidence ratio (1.63) of ESRF of all Australian metropolitan areas.

Certain NESB populations have higher incidence of renal disease, greater susceptibility to progressive renal damage and higher rates of diabetes and Hepatitis C. This includes groups such as south east Asians. The 1999/00 Area Renal Service Annual Report reported on a study of *Data Collection on NESB Patients Currently on Dialysis* by Janet Jiang. This indicated that 30% (68 out of 225) patients on dialysis are from NESB and there are a total of 22 languages spoken by these patients. The main causes of ESRF for NESB patients are diabetes mellitus and hypertension. The 2000/01 Area Renal Service Annual Report indicated that for the satellite dialysis services at Bankstown and Liverpool, 51% of patients were from an ESB and 49% were from a NESB.

The uptake onto the ESRF program in Aboriginal Australians in 1997 was 383 per million, accounting for 11.3% of all new ESRF cases. The most common underlying primary disease was Type 2 diabetes or glomerulonephritis (National Epidemiological Survey of Diseases of the Kidney and Urinary Tract, June 1999).

5.4 Causes of ESRF

There is a range of conditions that contribute to end stage renal failure (ESRF). Glomerulonephritis is the major underlying cause of renal failure. The ANZDATA Registry indicates that diabetes and hypertension are the next two major causes of renal failure.

Glomerulonephritis (GN) means inflammation of the glomeruli, the filtering units of the kidneys. This condition is not due to infection or cancer of the kidney and cannot be spread to other people. Both kidneys are always involved. Mild forms of GN are common and do not lead to kidney failure. Severe forms of GN are much less common but are more likely to cause kidney failure. These are usually associated with high blood pressure, larger amounts of protein in the urine and abnormal kidney function as well as signs of scarring, thickened blood vessels and damaged glomeruli in the kidney biopsy. Rarely, patients with severe disorders such as Goodpasture's syndrome and rapidly progressive glomerulonephritis will have kidney failure when they are first seen and then the chances of recovery are poor. GN is the most common group of disorders causing kidney failure in Australia. Although the most common condition diagnosed in this group is IgA glomerulonephritis, most people with IgA glomerulonephritis do not end up with kidney failure.

The vast majority of patients with mild glomerular disease, e.g. blood in the urine detected only on routine examination or mild proteinuria, only require regular follow-up to ensure that their kidney function remains unchanged and their blood pressure is normal (Australian Kidney Foundation, Facts Sheet).

Diabetes is rapidly increasing as the major cause of ESRF in Australia. The Australian Kidney Foundation is embarking on a program of population screening to try to identify early undiagnosed cases to ensure early appropriate referral. Further, diabetic nephropathy is potentially preventable or treatable with appropriate identification and specialist intervention, unlike many other forms of progressive renal disease. This is a critical issue in screening and early detection and management.

In the 1997 and 1998 NSW Health Surveys, the reported prevalence of current doctor-diagnosed diabetes or high blood sugar varied among NSW Health Areas. The reported prevalence ranged from the lowest (2.9%) in the Northern Sydney Area Health Service to the highest for the State in South Western Sydney males (6.3%). Reported prevalence among females in SWSAHS was 4.7%. Differences in prevalence among Health Areas may reflect differences in age structure but also differences in the ethnic composition and the proportion of indigenous people.

The Report of the NSW Chief Health Officer 2000 found that age-adjusted separation rates for diabetes mellitus amongst Indigenous people were about six times higher than for non-Indigenous people over the period 1993/4 to 1997/98.

Estimates of diabetes prevalence among Indigenous people vary from 5 to 19%, compared with 2 to 7 % among Caucasian Australians. High rates of diabetes, coupled with often limited access to appropriate services, results in high rates of hospital admissions for complications such as infection and kidney disease.

The prevalence of Type 2 diabetes is higher among people from the South Pacific Islands, the Middle East, Southern Europe and some Asian countries, as well as Aboriginal and Torres Strait Islander people (5% to 19%).

In addition to the current high prevalence it is acknowledged that diabetes is a major issue in SWSAHS with ageing of the SWS population and factors which contribute to diabetes, such as smoking and obesity, which are high in the SWS population

Hypertension is another major cause of ESRF. High blood pressure and kidney disease are closely related. Hypertension is a common cause of kidney failure in Australia.

If high blood pressure is left unchecked, it can cause blood vessels in the kidneys to become thickened and narrowed, possibly leading to reduced blood supply and reduced kidney function. Severe uncontrolled blood pressure called 'malignant' hypertension may cause severe or total kidney failure. These effects can be prevented if the blood pressure is brought under control with treatment. Correcting a kidney problem may also eliminate high blood pressure in some cases (Australian Kidney Foundation, Facts Sheet). Progression to ESRF is primarily seen in moderate, severe and very severe hypertension.

The prevalence of hypertension (≥160/90 mmHg) in adults 30 to 69 years of age in Australia has been reported as 20.6%, 19.6% and 17.1% in 1983, 1989 and 1995 from population based studies. The proportion treated with antihypertensive medication has increased from 50.3% to 58.3% to 72.1%, and the proportion of those treated with antihypertensive medication achieving a blood pressure <160/90 has increased from 63.4% to 64.4% to 75.1% with each study. Despite these improvements in the treatment of hypertension, as many as 76% of men and 50% of women 30 to 39 years of age, and 40% of men and 35% of women 60 to 69 years of age, remain at risk of the effect of hypertension due to either untreated or treated but uncontrolled hypertension (National Epidemiological Survey of Diseases of the Kidney and Urinary Tract, June 1999).

6. Dialysis Services in NSW

Renal services in NSW are organised into a series of renal treatment programs which provide access to a comprehensive range of screening, assessment and treatment services for patients with ESRF.

Major service networks include:

- Statewide Renal Services (Royal Prince Alfred [RPAH] and Concord Hospitals);
- Northern Nephrology and Renal Transplant network (John Hunter [JHH], Lismore and Tamworth Hospitals and Port Macquarie Private Hospital);
- Western Renal Treatment Program (Westmead Hospital);

- Royal North Shore Hospital (and Sydney Dialysis Centre which provides a statewide haemodialysis training and home based program) ;
- South Western Sydney Renal Service (Liverpool and Bankstown Hospitals);
- South East Health Service (Prince of Wales, Sydney Children's and St George Hospitals;
- Illawarra Renal Treatment Program (Illawarra Regional Hospital);
- St Vincent's Hospital; and
- Gosford Hospital

The range of services provided by these networks include:

- Dialysis treatment services (high dependency, limited care, self care);
- Home dialysis training programs (haemodialysis and/or peritoneal dialysis);
- Specialist home dialysis technical support services; and
- Renal outreach nursing services

6.1 Funding for home dialysis fluids and disposables

The funding for home dialysis fluids and electrolytes was devolved to Area Health Services (AHS) in 1997. Annual deficits are addressed by a levy on AHSs. The allocation for SWSAHS in 2000/01 was $1,660,158, including an adjustment of $197,035 in May 2001. It is understood that there may be proposals at the State level to change the current funding arrangements but there has not been any consultation with the Area Health Service at this stage.

6.2 Home Machines Capital Equipment Program

Sydney Dialysis Centre (SDC) retains the Statewide budget for home dialysis equipment and continues to administer the Statewide capital equipment pool. This includes:

- Purchasing of home dialysis machines within the allocated budget;
- Monitoring the pool and allocation to ensure equitable and fair distribution of machines across NSW renal treatment programs;
- Maintaining the asset register;
- Liaison with equipment suppliers;
- Reviewing and updating the 10 year capital plan for replacement and growth;
- Providing advice on the issuing of tenders; and
- In liaison with the Home Dialysis Advisory Committee, advising NSW Health of the next year's projected capital budget.

A capital levy may also be imposed on the Area Health Services where alternative funding sources cannot be identified by NSW Health for any shortfalls in capital funding. Capital set up costs are approximately $17,000-$20,000 per patient on PD. The capital costs for home haemodialysis is approximately $32,000.

7. Transplantation Services

A key related issue in renal services is that the only curative treatment of end stage renal failure is renal transplantation. There is clear evidence that transplantation is more cost effective than renal dialysis. Development of a local renal transplantation service would assist in improving local organ donation rates, would enable dialysis numbers to stabilise and possibly reduce, would improve surgical support of the renal service and would improve equity.

Only 3% of SWS residents having renal dialysis are currently receiving transplants reflecting significant access issues. In 1999/00 there were 16 episodes of care (EOC) for renal transplantation for SWSAHS residents. This compared to 18 EOC for Northern Sydney residents, 15 EOC for South Eastern Sydney residents, 12 EOC for Western Sydney residents and 10 EOC for Central Sydney residents.

Transplantation services are currently provided at RPAH, St. Vincent's, St George, Prince of Wales, Westmead, RNSH, JHH and the Children's Hospital, Westmead. A total of 149 renal transplants were performed in NSW between April 1999 and March 2000. The recently released *Report of the Greater Metropolitan Services Implementation Group June 2001* (GMSIG) recommends that transplant services be consolidated at Westmead, Prince of Wales, RPAH, JHH and the Children's Hospital, Westmead.

In relation to future service development, the Report proposes that in the event that levels of renal transplantation in NSW approach 220 per year, Liverpool Hospital is to be considered as the next centre for transplantation. GMSIG indicates that 149 transplants were performed at NSW centres from April 1999-March 2000. This comprised 102 cadaveric and 47 living transplants. It is apparent that there is a need to improve cadaveric transplant rates, including improving organ donation by better community awareness programs. This needs to target the different cultural and linguistic groups in SWSAHS. The Area is also considering a living donor program as part of improving levels of donation.

Planning for the Liverpool Stage 2 Redevelopment has identified the physical area that would be required for future provision of renal transplantation services (as well as expanded dialysis services) at Liverpool.

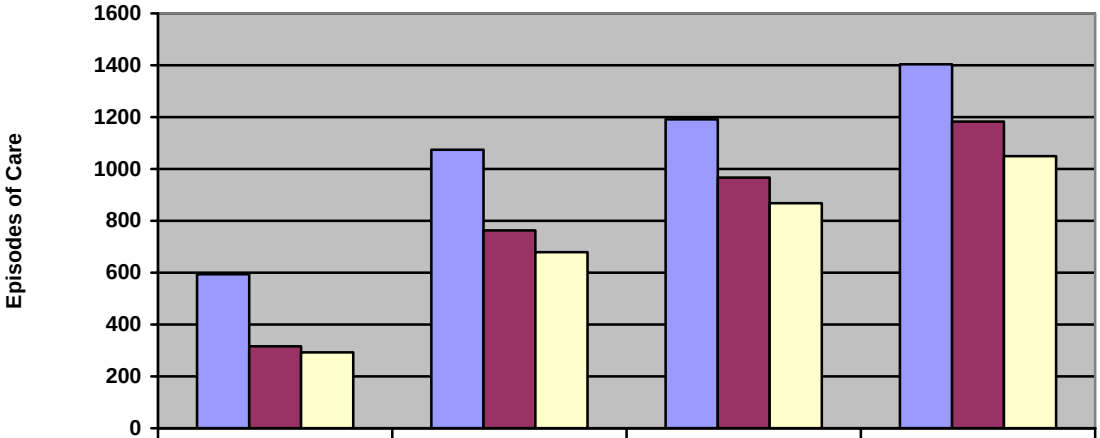
8. Renal Medicine Services in SWSAHS

Renal medicine services are currently provided at all hospitals in SWSAHS with the two main services at Liverpool and Bankstown-Lidcombe Hospitals. There has been a significant growth in local provision as the service has continued to develop in the Area. In 1999/00 there were a total of 1525 EOC provided for SWS residents in NSW and interstate. There was 5991 beddays provided in SWS hospitals for renal medicine in 1999/00. 121 EOC were related to the care of children aged less than 15 years.

55% of all renal medicine provided within SWSAHS is provided at Liverpool Hospital. 55% of care in the Area is provided on an overnight basis and 58% of care is as a planned admission.

This information relates to the Service Related Group of renal medicine. Patients who may be admitted with complications arising from their renal disease (such as peritonitis) or who require treatment for acute renal failure associated with another medical illness will not be reflected in this data. Non inpatient services provided are also not identified.

Renal Medicine - 1996/97-1999/00



	1996/97	1997/98	1998/99	1999/00
Demand	594	1074	1191	1404
Supply	316	763	967	1183
Capture	292	679	868	1049

Source: FlowInfo Version 4.2Q3

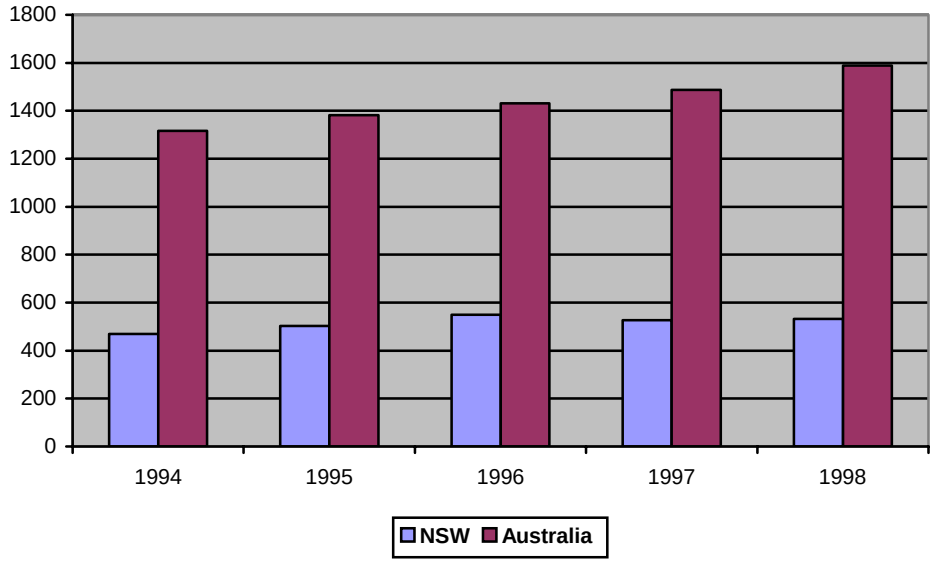
9. Demand for Dialysis Services

The ANZDATA Registry 1999 Report indicates that there were 5523 patients (295 per million) receiving dialysis treatment at the completion of the 1998 calender year in Australia. In NSW/ACT there were 2074 patients receiving dialysis. This translates to a crude (non age adjusted) prevalence rate in NSW/ACT of 312 per million.

The majority of patients were dialysing out of hospital with 40% dialysing at home and 31% dialysing in satellite centres. However over the last ten years, home haemodialysis has decreased from 21% of all dialysis patients to 12% of the total. CAPD numbers have decreased by 3% in the last year. The major growth area has been in satellite haemodialysis centres. It is noted that these centres vary considerably in the nature and activity of patients catered for, the degree of independence of the patients, the nurse:patient ratios and the degree of training of the staff.

9.1 National and NSW Incidence

Figure 2 - Number of New Cases NSW and Australia (1994-1998)

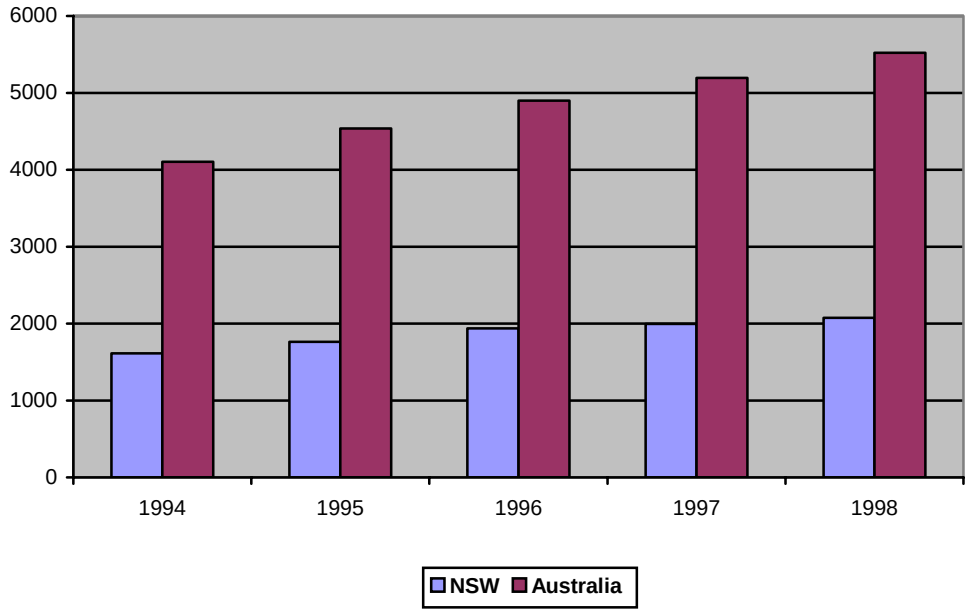


Source: ANZDATA Registry 1999 Report

9.2 National and NSW Prevalence

The number of patients on dialysis overall (prevalence) is also increasing both in NSW and nationally (Figure 2).

Figure 3 - Numbers of Patients on Dialysis NSW and Australia (1994-1998)



Source: ANZDATA Registry 1999 Report

10. The SWSAHS Renal Dialysis Service

Dialysis services in SWSAHS are managed on an Area-wide basis by the Area Renal Service. The service is managed through the Division of Medicine, Liverpool Health Service. Hospital services are provided at Bankstown-Lidcombe and Liverpool Hospitals. Services are to be established at Campbelltown Hospital as part of the Macarthur Sector Strategy.

10.1 Current Service Configuration of SWSAHS Renal Service:

Dialysis chairs are currently provided in the following units:

- In-Centre Haemodialysis Unit: This unit is located at Liverpool Hospital and has 10 chairs currently operational. This is to increase to 12 chairs in 2001/02. The capacity of the service is 15 chairs. The Unit opened in April 1994.

- The Community Haemodialysis Unit currently has two satellite services:

    1. Liverpool Hospital has 17 chairs (Goulburn Street centre). This service was established in 1995; and
    2. Bankstown-Lidcombe Hospital which currently has 6 chairs. This is to increase to 8 chairs in 2001/02. This service was established following the closure of Lidcombe Hospital and the opening of the new Bankstown-Lidcombe Hospital in 1997.

A third satellite unit is planned for Campbelltown Hospital as part of the Macarthur strategy. Initially 6 chairs will be commissioned in 2003 with a potential to increase to 10 chairs as required.

Home peritoneal and haemodialysis training is also provided by the Area Renal Service. 5 chairs are provided for home haemodialysis training accommodating 5 patients at a time. 2-3 training rooms are available for home peritoneal dialysis training.

- Continuous Ambulatory Peritoneal Dialysis (CAPD) provides a 24 hour on call service plus counselling services.

- Renal Ward (G1E)

    There are 22 beds for the inpatient care for renal patients at Liverpool Hospital. Inpatient services are provided at all SWSAHS facilities.

The Renal Research Unit was officially established in 2000 with the appointment of a Research Unit Manager in April 2000. There has been growth in the numbers of clinical trials, quality management projects and educational initiatives.

The Area Renal Service also has a range of other activities including the Renal Anaemia Coordinator Project, training of Renal Educators, Patient Education Committee, a Renal Support Group and a Pre-dialysis Clinic.

10.2 Liverpool In centre Haemodialysis Unit

This unit is located in the Clinical Services Building of Liverpool Hospital and has potential capacity of 15 dialysis chairs for infirm, unstable patients and highly dependent patients with multiple co-morbidities and/or frequent admissions. 10 chairs are currently funded and at June 2001 there were 48 maintenance patients. Acute renal failure patients are also dialysed by this service. These patients require a high level of care in a high dependency unit.

The in-centre haemodialysis unit includes haemodialysis support for the coronary care unit (Liverpool) and both intensive care units at Liverpool and Bankstown. There were 123 ICU/CCU treatments provided in 2000/01. The haemodialysis service is provided 6 days per week morning and afternoon shifts. The Unit provides a 24 hour, 7 day on call service.

10.3 Liverpool Community Haemodialysis/Home Training Unit

Located in the Goulburn Street Medical Centre, this unit currently provides satellite haemodialysis and training of satellite and home dialysis patients. It is also responsible for the support and promotion of home dialysis for more independent and stable patients. The unit operates 2 shifts per day 6 days per week. A 24 hour, 7 day on call service is provided. Monthly outpatient clinics are provided for home patients.

Although collocated with the community haemodialysis unit the home training area is physically separated from the satellite area. There is currently a proposal to relocate dialysis home training to the area currently being used by parenting education. This will allow the subsequent refurbishment and expansion of satellite dialysis into the vacated area and the service to become wholly satellite.

10.4 Bankstown Satellite (Ambulatory Dialysis Unit)

This 6 chair service is located at the Bankstown/Lidcombe Hospital. This unit provides a service partly of satellite type but also for more dependent patients. The unit provides a 24 hour on call telephone counselling service for clinical support when needed. The service is to be increased to 8 chairs in 2001/02.

10.5 Continuous Ambulatory Peritoneal Dialysis (CAPD)

Located in the Goulburn Street Medical Centre this unit provides home peritoneal dialysis. There were 119 PD patients at June 2001. Currently 40% of patients in SWSAHS are dialysing at home on Peritoneal Dialysis (PD). PD is quick, easy to learn, cost efficient and usually adequate for the first 5-10 years of treatment. Most patients transfer from PD to haemodialysis within 5 years. PD is viewed as a temporary and usually initial form of maintenance dialysis treatment. PD is not suitable in patients over 90Kg or if there has been multiple previous abdominal surgeries or if diverticulitis is present. It is most effective in the first few years after the development of ESRF.

10.6 Home Haemodialysis (HH)

Home haemodialysis is less expensive then hospital haemodialysis as it does not require nurses to be present, sophisticated water treatment or a highly specialised building. HH is comparable in recurrent costs with home PD although HH machinery has much higher capital costs. Nationally there is a trend to increased numbers on satellite (Community) haemodialysis rather than HH. For a patient to be accepted on HH they need to be fit, medically stable, intelligent, have good visual acuity and manual dexterity, be willing and have a partner/carer that is able to be present for 6-7 hours of haemodialysis three or four times per week.

The physical environment for HH also needs to be suitable as a spare room and good hygiene is required. This can be difficult to achieve when accommodation is rented or provided through the Department of Housing, although home modifications can be made with consultation with the Department. The home modifications, such as plumbing, required for HH cost approximately $1000. If the patient is unable to meet this cost there is currently no alternative source of funding to pay for the modifications.

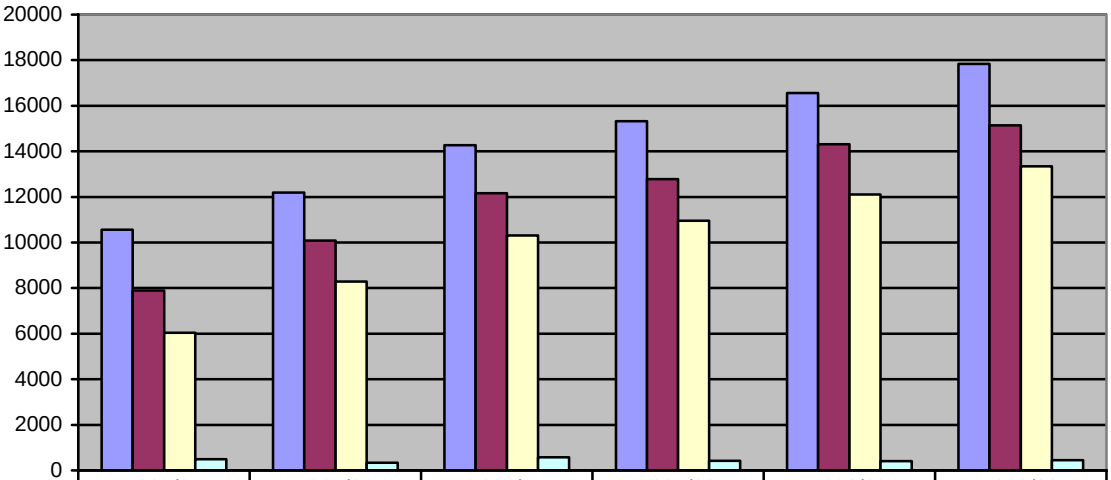
11. Utilisation trends in SWSAHS

11.1 Inpatient Services

The information in Figure 2 indicates activity for dialysis which has been counted on an inpatient basis. It needs to be understood that this is only part of the overall dialysis activity which is occurring within SWSAHS. In addition, this represents episodes of care (EOC) and not numbers of patients. To make an estimate of patient numbers, EOC are generally divided by 156 (assuming 3 treatments per week 52 weeks of the year). Based on this methodology, there would be 114 SWSAHS residents receiving inpatient dialysis at all NSW and interstate services, and 98 patients receiving care from the SWSAHS Renal Service (supply). Supply activity refers to services provided at either the in-centre or satellite services in SWSAHS. This includes both SWS residents and out-of-Area patients.

While supply of services and local provision of dialysis for SWS residents (capture) has improved over the period, demand continues to grow for the service. SWSAHS was capturing approximately 74.7% of the total SWSAHS demand by 1999/00. It should be noted that this is only one part of the demand for dialysis services as patients dialysing at home need to be included. If the 183 SWS residents on home peritoneal dialysis and home haemodialysis are included, approximately 60% of SWS residents are dialysed in the home which is higher than the NSW average.

Figure 4 – In centre and satellite utilisation of Dialysis Services in (SWSAHS) – 1994/95-1999/00



	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00
Demand	10566	12185	14268	15327	16565	17844
Supply	7888	10090	12161	12775	14311	15146
Capture	6035	8289	10314	10950	12104	13346
Private	497	339	577	422	411	444

Source: FlowInfo Version 4.2Q3

Table 2: National versus SWSAHS Utilisation

Table 2 provides information on the numbers of patients by method and location. It should be noted that the Area Renal Service information relates to patients managed by the Service (including some out-of-Area residents), and not the total number of SWS patients receiving dialysis. For example, as identified in section 11.2, there are 54 SWS residents on home dialysis managed by other services. FlowInfo data has been reviewed but is not considered appropriate to use to estimate actual patient numbers as this data would suggest a total hospital and satellite demand of 114 SWS residents. Based on actual patient numbers being managed by the SWS Renal Service, estimates of residents being managed outside the Area and home dialysis numbers, it is estimated that there are approximately 330-340 SWS residents on dialysis in 2001.

Method and Location	Australia		SWS Renal Service	
	No. of patients	**%**	**No. of patients**	**%**
Peritoneal dialysis	1608	29%	119	43%
Hospital haemodialysis	1525	28%	48	18%
Satellite haemodialysis	1737	31%	82	30%
Home haemodialysis	653	12%	24	9%
Total:	**5523**	**100%**	**273**	**100%**

Source: ANZDATA Registry – Interim Summary 1/10/1999-31/3/2000
SWS Renal Service Annual Report 2000/01, patients at June 2001

The percentage for PD in SWSAHS is much higher and the percentage of the SWSAHS population having hospital dialysis is 10% less than national trends. In SWSAHS CAPD has grown significantly with an increase of 47.8% over 3 years.

This is related to the role of CAPD as the first therapy for a significant number of new dialysis patients. CAPD is also a cost-effective modality of maintenance dialysis compared to in-centre haemodialysis or satellite dialysis. In SWSAHS, the physical capacity to support haemodialysis growth has also been constrained.

11.2 Home Dialysis Numbers

The Sydney Dialysis Centre (SDC) has advised that there are 183 SWS residents on home dialysis as at September 2001 with 126 on PD and 57 on haemodialysis. While the majority of patients are managed by the SWS Renal Service (129), some are managed by a number of dialysis units such as SDC (9), Blacktown (12), Prince Henry (5), St George (3), St Vincent's (1) and Dame Edith Walker [Concord] (23).

Table 3 – Number of SWSAHS Residents on Home Dialysis

LGA	CAPD	Haemodialysis	Total
Bankstown	22	11	33
Camden	3	3	6
Campbelltown	19	10	29
Fairfield	36	8	44
Liverpool	43	22	65
Wingecarribee	1	2	3
Wollondilly	2	1	3
Total	**126**	**57**	**183**

12. Forecast Demand for Dialysis Services in SWSAHS

As indicated earlier, Liverpool-Fairfield SSD has the highest standardised incidence ratio of ESRD in metropolitan Australia. The causes of these excess rates of ESRF are not understood and need to be investigated. For example, this may relate to poor access to early treatment of nephritis, treatment of diabetes and hypertension, unusual causes of renal disease, unidentified toxins in particular population groups or lack of preventative early renal failure programs. Once this is better understood the elements of a comprehensive renal service, including dialysis, will be better informed.

While this is noted, existing models have been used to estimate the demand for dialysis. The NSW Health 1996 *Review of Maintenance Renal Dialysis Services in NSW* used linear (model c in table 4) and exponential models (model d in table 4) to estimate future demand for renal dialysis. Both models assumed that the current number of transplants remain static and the mortality rate decreases to 2% per annum. In table 3 in estimating workload, the estimated prevalence rates have been applied to the number of people in the relevant age group. This methodology has only been used to 2006 as the model has this time frame. It is understood that forecasting models are to be reviewed following the April 2001 *NSW Health Review of Renal Dialysis Services Final Report*.

Table 4: Estimated number of patients 2001 and 2006

Treatment (prevalence) rates per million										
Age group	**2001**	**Model c**	**Number**	**Model d**	**Number**	**2006**	**Model c**	**Number**	**Model d**	**Number**
0-4	62105	16.6	1	16.6	1	63550	22.7	1	22.7	1
5-14	123108	41.3	5	41.3	5	125800	62.0	8	62.0	8
15-24	115448	131.0	15	131.0	15	121570	179.6	22	179.6	22
25-34	121016	218.5	26	218.5	26	126870	285.0	36	285.0	36
35-44	120763	301.5	36	301.5	36	124700	393.8	49	393.8	49
45-54	101957	495.6	51	495.6	51	112350	618.0	69	618.0	69
55-64	63299	888.1	56	903.9	57	82210	1042.0	86	1084.1	89
65-74	43482	1379.2	60	1845.5	80	47920	1824.8	87	3249.3	156
75-84	24567	441.4	11	1144.0	28	28410	633.3	18	3438.9	98
85+	6392	13.0	0	13.0	0	7300	16.0	0	16.0	0
TOTAL	**782137**		**261**		**300**	**840680**		**377**		**528**

Using this methodology there would be between 261-300 SWSAHS residents in 2001. It is estimated that there are 330-340 SWS residents currently requiring dialysis which is above the forecast range. In 2006 it is projected that between 377-538 SWSAHS residents will be requiring dialysis. If a base of 340 is used for 2001, there would be between 456-568 patients requiring renal dialysis in 2006.

While these models identify the size of the challenge facing both SWSAHS and NSW services, in developing the SWSAHS service it should be noted that not all these patients will be managed within SWSAHS. Paediatric patients would be managed by the specialist children's hospitals, some patients may be geographically closer to other dialysis units, patients may work closer to other units or may elect to be managed by a nephrologist outside SWSAHS (approximately 2-3 chairs).

Table 5 illustrates the projected allocation per each modality for 2001/02 and 2006. This demonstrates the forecast impact of increasing satellite haemodialysis.

Table 5: Projected allocation of patients based on the current modality utilisation in SWSAHS.

Method and Location	**2000/01 (SWS Renal Service)**		**2001 (SWS Residents)**		**2006**	
	Percent	**Number of patients**	**Percent**	**Number of patients**	**Percent**	**Number of patients**
Peritoneal Dialysis	43%	119	43%	146	33%	150-188
Hospital haemodialysis	18%	48	18%	61	15%	69-85
Satellite haemodialysis	30%	82	30%	102	43%	196-244
Home Haemodialysis	9%	24	9%	31	9%	41-51
Total:	**100%**	**273**	**100%**	**340**	**100%**	**456-568**

There are various methodologies for estimating the number of chairs required for dialysis. Assuming one dialysis machine can dialyse four patients, SWSAHS hospital and satellite dialysis services would require 33 chairs for current service delivery and 41 chairs if all SWS residents were treated within the Area. This would increase to 66-82 chairs by 2006.

Current physical capacity is 38 chairs with planned capacity of 48 chairs assuming all 10 chairs are commissioned at Campbelltown Hospital.

While an additional 2 chairs at Bankstown/Lidcombe Hospital have been approved for 2001/02, a final configuration of 10 chairs is recommended in relation to service need and cost effectiveness. It is acknowledged hat sufficient physical space needs to be identified which may involve some reorganisation of existing services. Capital funding will be required to undertake the refurbishment.

Full commissioning of available capacity in the Area is required in order to provide care for the expected numbers of patients managed by the SWSAHS Area Renal Service. There is a deficit to 2006 with additional capacity required.

12.1 Current Staffing Levels

There are currently 3.2 FTE nephrologists in SWSAHS. This is equivalent to one nephrologist per 236,849 people. 273 dialysis patients are managed by the SWSAHS Renal Service with a ratio of 1 nephrologist : 85 dialysing patients.

The following nursing ratios have been recommended by the *NSW Review of Renal Dialysis Services, 2001.*

Table 6: NSW Health Nurse patient ratios for dialysis settings

Dialysis setting	Level of care required	Proposed nurse:patient ratios	SWS current nurse:patient Ratios
CAPD		1:20-25	1:25
In centre	Patients who are medically unstable	1:2	1:3 maintenance patients 1:1 acute patients
Satellite	• Patients unable to run or set up dialysis machine • Patients who are mostly medically stable with some dialysis access problems • Patients requiring occasional medical advice and support	1:4	1:3 fully dependent 1:4 category 2 - semi independent 1:5 independent

Allied health staff, including a social worker, dietician and clinical psychologist are also available.

13. Key issues for health promotion, prevention, treatment and ongoing care

While this plan focuses mainly on the issue of renal chair capacity in SWSAHS, there are important issues that the SWS Area Renal Service is also involved with such as identifying opportunities to work with other agencies in preventing renal disease. This includes public health issues such as prevention and environmental factors such as housing and water quality.

13.1 Early Detection, Treatment and Management

Diabetes, hypertension and infection are preventable causes of ESRF. Involvement of General Practitioners in the early management and control of these conditions and health promotion strategies may prevent or delay ESRF. Early detection also enables improved control of these conditions and contributes to maintenance of the patient's overall well-being.

The Area through the Priority Health Care Program is developing hypertension and additional diabetes services across the Area. The Diabetes Area Advisory Committee has been requested to consider the implications for renal services of diabetes when updating the Area Diabetes Plan.

Management of renal disease in children is also important in delaying the progression to ESRF where possible. Paediatric dialysis services are provided at the two Sydney specialist children's hospitals. Given the numbers of children in SWSAHS, outreach clinics from these services may be reconsidered to provide care locally where appropriate.

13.2 Early Referral to Nephrologists

Many patients with potentially serious yet possibly reversible renal disease are not referred until substantial irreversible scarring has occurred. Late referral of patients with renal failure is associated with increased patient morbidity and mortality, increased need for and duration of hospital admission and increased initial costs of care following the commencement of dialysis. Additional benefits include identifying and treating reversible causes of renal impairment and managing the multiple coexisting conditions associated with chronic renal disease. These outcomes can be improved by referring patients with chronic renal failure to a nephrology service well in advance of the need for dialysis. Adequate preparation for dialysis or transplantation (or both) requires at least 12 months of frequent contact with a renal care team. These issues are discussed in the CARI guidelines.

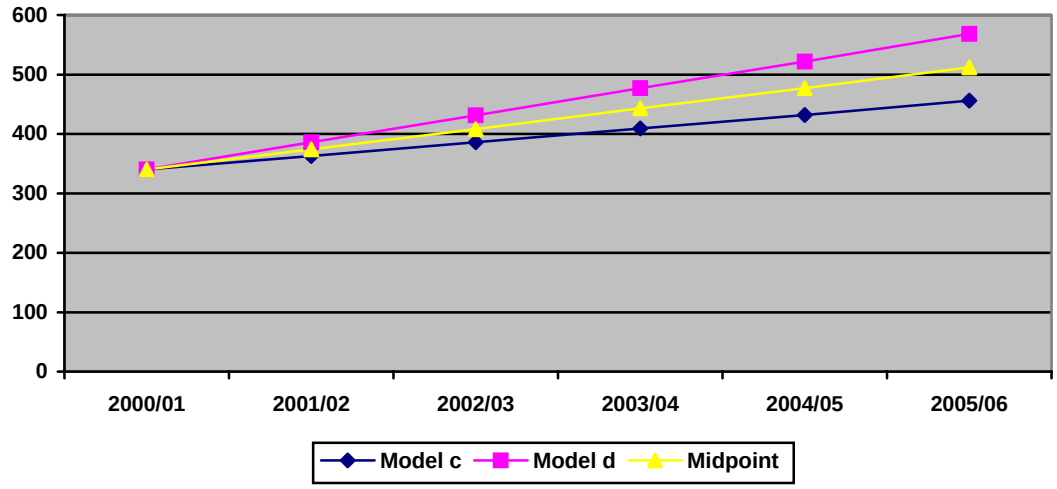
14. Strategies and Implementation

14.1 Service Delivery

There is no spare capacity in the current number of funded chairs, or in centres other than the Liverpool in-centre service. There are 273 patients currently receiving maintenance dialysis under the care of the SWS Renal Services.
There is continuing demand for new haemodialysis places from patients living in SWSAHS with newly developing end-stage renal failure and patients living in SWSAHS who may be dialysing in other Area Health Services.

As discussed previously, it is difficult to confirm exactly the number of SWSAHS residents receiving dialysis and the quantum of service needed to be provided within SWSAHS. To guide service development to 2006, a mid point between the two forecasting methodologies is proposed with an annual review of the baseline. This review of patient numbers is proposed to occur in December of each year.

Figure 5: Estimates of demand (model c and d) and midpoint



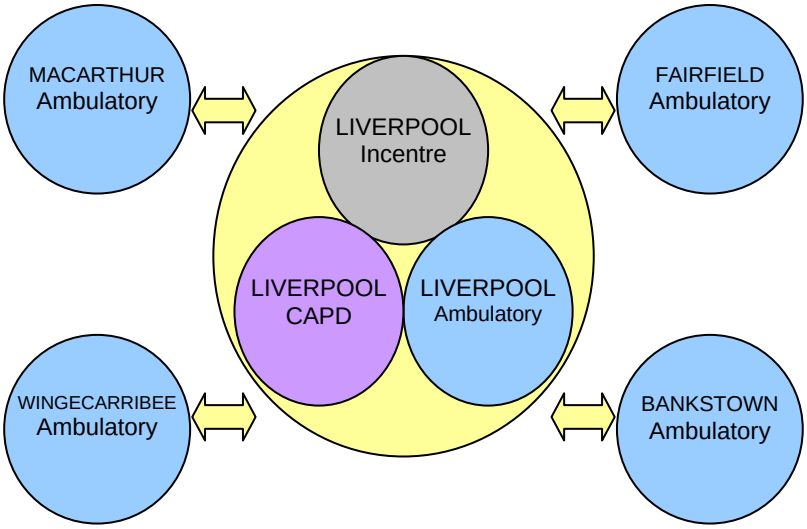
14.2 Proposed Service Model

As indicated, a mid point between the two forecasting methodologies has been used to guide service development to 2006. An annual review of the baseline is proposed given the rapid growth. Based on the forecast demand and the estimated number of patients that would be managed by the Area Renal Service, it is proposed that the service model for dialysis services continue as an Areawide service with development of decentralised units of up to 10 chairs (considered to be an efficient sized unit for staffing and patient management) in Bankstown, Macarthur and eventually Fairfield.

SWSAHS currently manages 80% of SWS residents requiring dialysis. It is assumed that with a new unit at Macarthur, expansion of Bankstown-Lidcombe and Liverpool services and services at Fairfield and possibly Bowral, self sufficiency will increase to 90%. This increase in self sufficiency is considered reasonable given the travel imposts for this group of patients. Transfer of funding for current patients electing to transfer back to local services would be negotiated as part of the budget holding process.

The Liverpool service would continue to provide incentre services, as well as community/ambulatory and CAPD and satellite (ambulatory) services. Without this decentralised approach there would be a need to develop a very large service at Liverpool which raises issue of access, transport and capacity to provide parking and physical capacity. Depending on future demand and clinical support, a service may be sustainable at Bowral. This will need to be monitored. There is currently a possible, publicly initiated fund raising in relation to building and equipping a small local unit at Bowral.

Figure 6: Proposed Service Model for SWSAHS Renal Dialysis Services



Bankstown and Macarthur services will provide "hybrid" services for some patients of a higher acuity than generally provided by satellite services. For example, the morning shift may have the more dependent, chronically unwell in-centre type patients, including inpatients, while the afternoon shift may be more independent robust outpatients. In-Centre type patients will not necessarily have to travel to Liverpool, unless they require admission, surgery or another intervention with acute problems. Therefore most in-centre patients will be able to dialyse locally. This is consistent with the role of Bankstown-Lidcombe and Campbelltown Hospitals.

Following this increase in capacity, a Fairfield service would then be developed with confirmation of the demand for the service.

Planning for the numbers of chairs has been based on a mid point of 460 patients by 2006 assuming 90% occupancy. In order to meet the projected demand for services there should be incremental increases in the supply of all modalities of dialysis over the 5 year period. The following table shows the annual growth required for each dialysis modality. It is assumed that the distribution of services will shift to approximately 60:40 between incentre/satellite and home dialysis.

Table 7: Projected modality utilisation and total patients using the mid range of projections

Year	Incentre	Satellite	Home Haemodialysis	CAPD	Total
2000/01	48	82	24	119	273
2001/02	52	90	29	120	291
2002/03	52	106	30	125	313
2003/04	60	130	33	130	353
2004/05	70	176	36	140	422
2005/06	70	200	40	150	460
Current %	18%	30%	9%	44%	100%
Final %	15%	43%	9%	33%	100%

Table 8: Sector annual growth required for each dialysis modality and the service location to meet the projected demand.

		2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	Total Increase 2000/01-2005/06
Liverpool Incentre	Chairs	10	12	13	15	15	15	5
	Patients	48	52	52	60	70	70	**22**
Liverpool Satellite	Chairs	17	17[1]	19	19	19	20	3
	Patients	60	60	76	76	76	80	**20**
Bankstown Ambulatory	Chairs	6	8	8	8	10	10	4
	Patients	22	30	30	30	40	40	**18**
Campbelltown Ambulatory	Chairs	0	0	0	6	10	10	10
	Patients	0	0	0	24[2]	40	40	**40***
Fairfield Ambulatory	Chairs	0	0	0	0	5	10	10
	Patients	0	0	0	0	20	40	**40**
Total chairs		33	37	40	48	59	65	32 (chairs)
Total patients in centre & satellite	Patients	130	142	158	190	246	270	**140 (patients)**
Home (haemodialysis)	Patients	24	29	30	33	36	40	**16**
CAPD	Patients	119	120	125	130	140	150	**31**
	Total Patients (supply)	273	291	313	353	422	460	**187**
Total funding required for incentre and satellite			$452,000	$678,000	*$1,375,000*	*$900,000*	*$600,000*	
Growth enhancements allocation		$100,000	$452,000	$678,000	TBA	TBA	TBA	

1. The satellite service has 12 chairs with 5 chairs in the Home Training Unit which are partially used. With the proposed relocation of the Home Training Unit it would be planned to increase satellite from 12 to 19 chairs.
2. Resources to be sourced from the Macarthur Strategy recurrent enhancements: $600,000 in 2003/04 and $400,000 in 2004/05

Table 8 indicates the growth to meet forecast demand. The growth in 2001/02 and 2002/03 has been matched to available funding and reflects the expansion agreed as part of the enhancement process. In 2003/04, as well as an increase in chairs at the Liverpool in-centre service and commencement of the services at Campbelltown, there may be an opportunity to increase the numbers of patients dialysing through changes in service delivery hours. This could include evening and/or Sunday shifts.

14.3 Staffing and Support Services Implications

14.3.1 Medical

There is currently no agreed medical staffing guideline for renal dialysis services. Factors that have been identified as being an issue in determining staffing numbers are complexity, geography, other roles, numbers of clinics and so on. There is currently 3.2 FTE nephrologists in SWSAHS comprising three staff specialists, one VMO and one academic. This is a dialysis patient to staff ratio of 85:1.

Due to the geographical distribution of SWSAHS hospitals it is considered that there would need to be an additional 1.0 FTE nephrologist for each new satellite service to provide supervision and medical cover. It is proposed that based on current workload there should be one nephrologist per 50-65 dialysis patients.

Table 9 demonstrates the incremental increases in FTE nephrologists required to meet the growing demand and proposed supply. In addition, registrar numbers will also need to increase to meet growing demand. Each hospital with a renal dialysis service will need daytime medical cover and capacity for resident medical officer coverage will need to be considered (Campbelltown and Fairfield).

Table 9: Proposed medical staff configuration

	2001/02	2002/03	2003/04	2004/05	2005/06	Total Increase to 2005/2006
Number of patients (current 273)	**307**	**313**	**353**	**422**	**460**	**153**
Total FTE Nephrologist required (current 3.2 FTE)	**4.7-6.0**	**4.8-6.3**	**5.4-7.1**	**6.5-8.4**	**7.0-9.0**	**3.8-5.8**
Renal Registrar (current 3.0 FTE)	**3.0**	**3.0**	**4.0**	**4.0**	**5.0**	**2.0**
Resident Medical Officer (1.0 FTE per new satellite)			**1.0**	**1.0**		**2.0**

While considered later, it is considered that case management is an integral part of improving the efficiency of medical staff input to the management of patients. Case management is also important in offsetting limited availability of nephrologists.

Surgical support for vascular access is also important and it is proposed that consideration be given to recruitment of a full time vascular access surgeon for the service as in other NSW renal services. As well as an important service need, development of renal transplantation services within SWSAHS would assist in making such a position attractive.

14.3.2 Nursing

The *NSW Health Review of Renal Dialysis Services* reported that NSW is the only state that predominantly uses registered nurses (RNs) to care for patients in dialysis units. It is understood that the other states utilise a mix of RNs, enrolled nurses and or technicians (at the appropriate level of care) and specifically have up skilled Aboriginal health care workers to care for their patients in remote settings. There is no reported evidence to indicate that the outcomes are of a lower quality in these States.

The opportunities from a changing staff mix need to be considered further by the Area Renal Service in order to identify and develop the appropriate infrastructure and educational support to support the expansion of renal dialysis services. It is likely that there will continue to be shortages of nursing staff for some time and innovative strategies will be required.

This issue will need to be considered by nursing if there are notable problems with supplying staff for the proposed increases in chairs in each of the sectors. Larger sized units also provide greater opportunity for a mix of staff.

Table 10: Proposed Additional Nursing Numbers (FTE)

Centre	Additional patients					Additional nursing staff required				
	01/02	02/03	03/04	04/05	05/06	01/02	02/03	03/04	04/05	05/06
Liverpool Incentre		4		18		4.5 FTE	4.5 FTE	2.0 FTE		
Liverpool Satellite	16				4	0.75 FTE 1.5 FTE for training area	1.0 FTE	2.0 FTE		1.0 FTE
Liverpool CAPD						1.0 FTE		1.0 FTE	1.0 FTE	3.0 FTE
Bankstown Ambulatory	8		10			2.0 FTE		2.0 FTE		
Campbelltown Ambulatory			24		16			6.0 FTE + NUM		4.0 FTE
Fairfield Ambulatory				20	20				5.0 FTE + NUM	5.0 FTE

14.3.3 Allied Health and Support Staff

The Area Renal Service has proposed the following resource requirements that need to be considered in their overall resource allocation.

Rehabilitation services for renal patients have been identified as an issue in the consultations undertaken as part of the development of the Area medical rehabilitation plan. The requirements have been considered in the rehabilitation planning process.

Table 11: Additional Allied Health and Support Staff for Area Renal Service (FTE)

Staff	Ratio FTE: patient	2001/002 Additional	2002/03 Additional	2003/04 Additional	2004/05 Additional	2005/2006 Additional
Dietician	1:150 patients	0.2 FTE	0.2 FTE	0.5 FTE	0.2 FTE	0.2 FTE
Social worker	1:150 patients	0.2 FTE	0.2 FTE	0.5 FTE	0.2 FTE	0.2 FTE
Clinical psychologist	0.5:150 patients	-	0.2 FTE	-	0.2 FTE	0.1 FTE
Occupational therapist		0.2 FTE				
Pharmacist		0.2 FTE		0.3 FTE		
Podiatrist		* FTE to be identified				
Business manager for Area Renal Service		0.5 FTE		0.5 FTE		
Data Manager for Area Renal Service		0.5 FTE		0.5 FTE		
Case Manager	1:150 patients	1.0 FTE		1.0 FTE		2.0 FTE
Storeperson		0.5 FTE				

14.3.4 Vascular Access Surgery

There are currently 1.5 lists for vascular access surgery. 226 cases were coordinated in 2000/01, an increase of 29 cases compared to 1999/00. There have been improvements in times that patients wait for access surgery, but cancellation rates were 15% for 2000/01. There continues to be an increase in the number of patients requiring permanent access and it is estimated that an additional list is required for tunnelled vascaths.

Delays and cancellations in planned access procedures also contribute to significant morbidity through prolonged use of vascular catheters which lead to increased risk of infection and decreased success of restoration of arterio-venous (AV) access. CARI guidelines relating to vascular access also need to be considered to achieve the target of AV fistula being the first access device in 80% of patients.

There have been enhancements for elective surgery in the Area. There will need to be further discussions with the Division of Surgery at Liverpool Health Service regarding the options available to provide this additional list.

14.3.5 Radiology and Pathology

It is acknowledged that an increase in dialysis services will impact upon demand for support services such as radiology and pathology services. . Dialysis patients have an increasing range of procedures completed by radiology. These include a chest x-ray as a departmental or mobile procedure done pre, post or during dialysis and digital subtraction angiography (DSA) and/or ultrasound for assessment of vessel viability as well as for transplants including investigation of rejection. Stenting is becoming more common and is a very time and resource consuming procedure. The insertion of vascaths in radiology and their follow up checking is also a regular procedure. Some of these procedures may also be performed in nuclear medicine.

It is not possible as this time to determine the average imaging cost per renal dialysis patient. However, with development of radiology as a business unit, the usage of radiology will become more apparent.

For pathology services, SWAPS has advised that renal patients comprise a relatively small percentage of the service's overall workload. For any enhancements of renal services it would be estimated that pathology would account for 8% of total expenditure. However, the impact on SWAPS will depend on the requirements for pathology. For example, if the services mostly are common high volume tests which can be done at the Area laboratories then the costs may be on the low side. If a large part of the work has to be decentralised because of a need for turn around times of two hours or less there will be major cost and resource implications. Another major driver of expense will be the need for nucleic acid amplification testing for Hepatitis C. The requirements for this will need to be clearly defined.

14.3.6 Emergency Department

There is generally considered to be flow on impacts to other services such as emergency and intensive care, from a growth in renal dialysis services. The actual impact for emergency services is difficult to identify accurately as the Emergency Department Information System (EDIS) is not reliable and patients generally present with another problem (such as peritonitis) and will therefore not be identified as renal dialysis. Review of FlowInfo data for 1999/00 was undertaken which indicated that of 15,146 episodes of care (EOC) for renal dialysis provided by SWSAHS, 5 were unplanned. For renal medicine, 512 EOC of 1205 EOC were unplanned.

If the percentage of unplanned admissions continued the same to forecasts of renal medicine activity for 2006 and 2011, there would be up to 1 additional unplanned admission per day across the Area.

An associated benefit of a decentralised model would be expected to be less ED attendances at SWS services currently providing dialysis services. In general, patients who become unwell, even for an unrelated illness, attend the hospital emergency department where they are treated.

With intensive care services it is again difficult to quantify the impact of additional dialysis patients due to ESRF. Patients in intensive care with acute renal failure will be managed consistent with any acute illness and the costs of this will be reflected in the cost weighted episodes of care.

The main issue to recognise is that growth in these inpatient services will have an impact on other services and this will need to be considered in the use of enhancement funding for the service.

14.3.7 Interpreters

Access to interpreters is acknowledged as a growing concern for renal dialysis services and is an important resource required for the training of NESB patients and carers.

The Liverpool Multicultural Health Service undertook a study involving data collection on NESB patients currently on dialysis in 2000. This indicated that 30% of the renal dialysis patients in SWSAHS are from NESB. The majority of these people were born overseas in non-English speaking countries. A total of 33 out of 68 patients (49%) required the use of an interpreter.

The top six languages spoken by SWSAHS dialysis patients are Arabic, Cantonese, Italian, Vietnamese, Greek and Cambodian. It has been suggested that health education messages and resources should be available in these languages. The priorities and funding required to develop information and educational material in other languages need to be identified.

14.3.8 Renal Transplantation

Development of renal transplantation is an important factor in stabilising or reducing the demand for dialysis. As indicated earlier in the Plan, the Report of the GMSIG recommended that in the event that levels of renal transplantation in NSW approach 220 per year (currently 145), Liverpool Hospital is to be considered as the next centre for transplantation. A key issue in progressing the development of transplantation services is improving rates of donation for both living and cadaveric transplants.

There is some expertise already in Liverpool Hospital in ICU, theatres, surgery and post operative management to provide a high quality transplant service. A transplant coordinator is also available in SWSAHS. Planning for the Liverpool Stage 2 Redevelopment has identified the possibility of renal transplantation being performed in Liverpool Hospital and an expansion area has been identified in an extension to the Clinical Building.

14.3.9 Research and Teaching

Ongoing development of clinical research and teaching is a requirement for the provision of excellence in the provision of dialysis services. As indicated there are major issues to be investigated in understanding the excess rates of ESRF in SWSAHS. This will enable SWSAHS service developments to be more effective.

15. Funding Implications

There are additional funding requirements relating to increasing inpatient demand for dialysis services. The Area is also subject to a levy for the shortfall in home dialysis recurrent funding and may be subject to a further levy for any shortfall in home dialysis capital funding.

The Area Renal Service budget for 2001/02 was $8,662,408. There have been enhancements of $1.23 million recurrent funding allocated for renal dialysis services for the period 2000/01-2002/03 (excluding home dialysis). This comprises: $100,000 in 2000/01; $452,000 in 2001/02; and $678,000 in 2002/03. A total of $1.0 million will need to be sourced from the Macarthur Strategy for the unit to be established in Campbelltown in 2003.

In relation to inpatient services, there would be an increase of 145 patients being treated at in-centre and satellite services between 2001-2006 based on this plan. To 2006 there is therefore a possible further funding requirement for renal dialysis services of $2.8 million (includes $1.0 million for Macarthur) for the estimated growth in inpatient dialysis.

A comprehensive asset plan for dialysis machines is required. This needs to consider maintenance and repair contracts as well as an equipment replacement program for dialysis machines. The funding required will be considered through the usual Area capital works processes.

The current process for home dialysis involves an allocation from the Department with a levy on Area Health Services to meet any deficit in annual funding. The final allocation for the 2000/01 SWSAHS home dialysis budget was $1,660,158 including an adjustment of $197,035 in May 2001. The Area will continue to be levied under current arrangements for growth in home dialysis. In addition, should alternative sources of capital funds not be identified the potential home dialysis capital liability for the Area is estimated to be in the order of $1.5 million based on the additional number of patients to 2006.

16. Conclusion

There is a need for the Area Health Service and Area Renal Service to develop a pro-active response to the forecast ongoing growth in renal dialysis services. This includes not only provision of additional dialysis capacity but a focus on early detection, prevention and control of conditions which contribute to ESRF. This issue is very much related to the current initiatives regarding diabetes and hypertension in the Area as the management of these conditions is integral to renal services as well as other clinical services such as endocrinology.

This Plan proposes the expansion of services to meet a mid point for the likely growth. There are major issues related to both recurrent and capital funding of this proposed service expansion as outlined in the above section on funding implications. For the years 2001/02 and 2002/03 the service expansion has been matched to the funding available to the Area for growth in this service.

A range of strategies have been developed in relation to the issues identified in this Plan and are provided in the following section.

Given the high cost of renal dialysis services and the projected growth, the *NSW Health Review of Renal Dialysis Services in NSW* has also recommended that Area Health Services should explore opportunities for private sector collaboration in both the capital development and provision of renal dialysis services. The Area Health Service and Area Renal Service will need to determine the type and extent of any such collaboration.

17. Strategies

GOAL 1: HEALTHIER PEOPLE

SERVICE OBJECTIVE: **To promote changes in health related behaviour which are conducive to preventing end stage renal function in SWS community**

LINK SDS		STRATEGY	PERFORMANCE INDICATOR	RESPONSIBILITY	TIME FRAME	RESOURCE REQUIRED	SOURCE
KC 5	**1.1**	Continuing identification of appropriate responses to preventable causes of ESRF such as diabetes, hypertension and pyelonephritis	Policies developed	Area Renal Service, Diabetes Advisory Committee, Chronic and Complex Care Committee	Ongoing	Not identified	
KC 5	**1.2**	Implementation of CARI Guidelines	CARI Guidelines are followed	Area Renal Services	Ongoing	Not identified	

GOAL 2: FAIRER ACCESS

SERVICE OBJECTIVE: **To ensure that all patients requiring renal dialysis services who live in SWSAHS have equitable access to care for their illness; and ensure that care is provided in a manner which is appropriate to the needs of community groups and individuals within SWSAHS.**

LINK SDS		STRATEGY	PERFORMANCE INDICATOR	RESPONSIBILITY	TIME FRAME	RESOURCE REQUIRED	SOURCE
KC 3	**2.1**	Annual review of growth in ESRF to refine forecasts for the following year and identify impact on Area for delivery of dialysis services	Review performed annually	Area Renal Service/Division of Planning	Annual		
KC 3	**2.2**	Increasing satellite and in-centre capacity to meet demand	Expansion of Bankstown Satellite service; full utilisation of Liverpool dialysis capacity; Commissioning of Macarthur satellite service 6 chairs initially (2003/2004); and Satellite service established at Fairfield Sector consistent with growth in demand	DCEO, GMs Bankstown Liverpool and Macarthur/Area Renal Service	2001/02		Growth funding for 2001/02 & 2002/03
	2.3	Consideration of alternative workforce structures (RNs, technicians etc) n.	Appropriate staffing for current and expanded services	Area Renal Service/Area Director Nursing and Clinical Services			

LINK SDS		STRATEGY	PERFORMANCE INDICATOR	RESPONSIBILITY	TIME FRAME	RESOURCE REQUIRED	SOURCE
KC 3,6	**2.4**	Refine and confirm workforce requirements for projected demand	Training and recruitment strategies developed matching incremental increases in modalities 2001-2006	Area Renal Service/Sector Human Resources	2002 - ongoing		
	2.5	To work with the Area Organ and Tissue Coordinator to facilitate increased numbers of live and cadaveric transplants	Increase in numbers of transplants	Area Organ and Tissue Coordinator/Area Renal Service			
KC 3	**2.6**	Continue to monitor the threshold for establishment of Renal Transplant Unit at Liverpool Hospital	Annual review of NSW transplant activity and SWSAHS access to transplantation services	Area Renal Service/Division of Planning	2002-ongoing		Nil
KC 3	**2.7**	Identify and quantify NESB information/ education and interpreter requirements	NESB policies developed	Area Renal Service	2001/2002		

GOAL 3: QUALITY AND SAFE HEALTH CARE

SERVICE OBJECTIVE: **To ensure that all residents utilising renal dialysis service have access to optimally effective and safe care for their illness; and to stimulate research, education and training in renal dialysis services among medical, nursing allied health science students and graduates.**

LINK SDS		STRATEGY	PERFORMANCE INDICATOR	RESPONSIBILITY	TIME FRAME	RESOURCE REQUIRED	SOURCE
KC 7	**3.1**	Further opportunities for research, continuing education and training are identified	Continuing QA activities teaching and research	Area Renal Service	Ongoing		
KC 7	**3.2**	That research into the causes of ESRF in SWSAHS populations be undertaken	Research in progress	Area Renal Service	Ongoing		

GOAL 4: BETTER VALUE

SERVICE OBJECTIVE: **To ensure that renal dialysis services are delivered in the most efficient manner possible.**

LINK SDS		STRATEGY	PERFORMANCE INDICATOR	RESPONSIBILITY	TIME FRAME	RESOURCE REQUIRED	SOURCE
KC 5	**5.1**	That SWSAHS satellite dialysis service configurations plan a minimum 10-12 chairs to enable maximum service efficiencies to be achieved.	Current and proposed SWSAHS satellite units be developed as 10-12 chairs	Area Renal Service/ GM sectors	Ongoing		
KC 5	**5.2**	Consideration of additional shifts to meet increasing demand and consumers needs	Additional patients managed within current chair capacity	Area Renal Service	2001/02		
KC 5	**5.3**	That the Area Renal Service ensure that networking of services support best outcomes for SWSAHS dialysis patients	Areawide protocols and practices developed, particularly as new units develop	Area Renal Service	Ongoing	Nil	

18. References

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