



Health
Western NSW
Local Health District



Living Well Together

Western NSW Local Health District

Renal Services - Clinical Service Plan 2014 to 2018

Version 2.0 – Nov 2015

Document Administration

Revision History

Date Issued	Version	Comments
May 2014	1.0	Presented to Working Party – changes incorporated following meeting 6 June 2014
17/06/14	1.1	Circulated to Working Party for review – suggested amendments attended
02/09/14	1.2	Circulated to Renal Stream for comment
30/09/14	1.3	Sent to Manager Planning and Service Development for review
07/10/14	1.4	Sent to Working Party and Renal Stream for endorsement to circulate further
17/10/14	1.5	Endorsed by Renal Stream for further distribution
11/10/14	1.5	Endorsed by Western NSW LHD Board
14/11/14	1.6	Circulated to key stakeholders for comment
02/12/14	1.7	Feedback received incorporated into document
14/01/15	1.8	Document amended following meeting with Director Operations
02/03/15	1.9	Document amended to reflect Home-Based Dialysis Report
16/04/15	1.10	Amended to reflect Implementation Plan
16/10/2015	2.0	Final version endorsed by Renal Stream

Document Approval

Date	Approved By	Referred to:
02/09/14	Renal Plan Working Party	Renal Stream
07/10/14	Manager Planning and Service Development	Working Party and Renal Stream
17/10/14	Renal Plan Working Party and Western NSW LHD Renal Clinical Stream	Western NSW LHD Board and relevant stakeholders
11/11/14	Western NSW LHD Board	Key stakeholders for review and comment
April 15	Renal Plan Working Party and Western NSW LHD Renal Clinical Stream	Western NSW LHD Board

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SHPN (SDD)

ISBN

Content within this publication was accurate at the time of publication

November 2015

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1. Executive Summary

The *Western NSW Local Health District Renal Services – Clinical Service Plan 2014 to 2018* was developed to assist in meeting current and projected demands for renal services, improve the coordination of renal services and to align renal services with the strategic directions set out in the *Western NSW Local Health District Strategic Health Services Plan 2013 - 2016*. The *Western NSW LHD Renal Services – Clinical Service Plan* provides a foundation for decision making regarding the development of renal services and is informed by NSW strategic directions and policy statements.

Renal disease is the progressive loss of kidney function. Renal disease or Chronic Kidney Disease (CKD) comprises a continuum of disease, ranging from mild kidney damage through to end stage kidney disease/failure (ESKD or ESKF), which is irreversible and permanent. ESKD is treated by renal replacement therapies (RRT) including haemodialysis (HD), peritoneal dialysis (PD) or transplantation. Kidney Health Australia states that CKD is a significant and growing public health problem, responsible for substantial burden of illness and premature mortality.

The number of Western NSW residents requiring dialysis and kidney transplant services over the past decade has grown significantly and this increase in demand is projected to continue. Factors impacting on the higher prevalence of renal disease within the Western NSW LHD include an ageing population, the lower socioeconomic status of our communities, the high proportion of Aboriginal people and the higher prevalence of risk factors such as higher smoking rates, higher levels of obesity, cardiovascular disease and diabetes. These factors combine to place Western NSW LHD renal services under intense demand and capacity pressure

The Western NSW LHD renal services may be subdivided into two service networks, the Northern Sector Renal Service and the Southern Sector Renal Service. The profile of services within each sector includes hospital based HD units complemented by pre-dialysis services including renal outpatient clinics, access surgery and home training. Renal outreach services are also provided to support people living in the community with CKD and people who are dialysing at home.

The configuration of the Western NSW LHD hospital-based HD services includes two Level 5 HD units (commonly known as in-centre units) located at Dubbo and Orange, one Level 4 HD unit at Bathurst, one Level 3 HD unit (commonly known as a satellite unit) at Forbes and 10 facility-based (self and/or non-self-care) units located at Bourke, Brewarrina, Coonamble, Gilgandra, Mudgee, Narromine, Nyngan, Walgett, Warren and Wellington.

There were a total of 171 people receiving renal dialysis within the Western NSW LHD at April 2014. In terms of treatment modality, the percentage of people in the Western NSW LHD receiving hospital-based dialysis is 67% of the dialysis dependent population which is above the NSW target of 50%. The number of people receiving home based dialysis therapies is significantly below the 50% State benchmark.

Recent consultations with the Western NSW LHD Renal Stream Committee have identified the following issues as having the most significant impact on current and future service provision:

- The current and forecast demand for dialysis services and the LHDs renal services current and future capacity to meet projected demand
- The need for consistent practices across the LHD. The existing two renal services (Northern and Southern Sector) vary in both areas of clinical practice and funding mechanisms. There are also variations in workforce profiles for each of the Level 5 units and different nurse to patient ratios are in place

- Home based therapies within the LHD are below State benchmark. Currently only 33% of the LHDs dialysis population have their treatment at home. This is well below the NSW target of 50%
- There are limited transport options for people travelling greater than one hour one way for dialysis treatment. This is compounded by the lower socio-economic status of the population and associated difficulties in accessing transport
- Non-admitted patient activity is under captured, and reporting and coding methods are inconsistent. This impacts on activity analysis and future demand projections and has funding implications
- Needs analysis demonstrates there are currently areas where despite demand, infrastructure or capacity is not available to provide treatment 'close to home'. Priority areas for future renal service development are Cowra and Nyngan
- Anecdotal information indicates that the requirement to travel to Sydney for home HD education/training is a disincentive for the uptake of home HD in the Southern Sector. Home HD training is currently not available at the Orange Unit
- Treatment flexibility is limited within units, for example the allocation of a 'floating chair' would accommodate people who need to change treatment days and people accessing respite or holiday dialysis
- Funding mechanisms and the ongoing management of people dialysing at home varies across the LHD

The Western NSW LHD Renal Services have identified the following ten key areas of focus to improve renal service access, delivery and quality:

1. The establishment of a coordinated and coherent system of care, with consistent operating policies, funding mechanisms and well defined pathways to support people through predialysis education and support, dialysis training and RRT
2. Retention and recruitment of a sustainable skilled workforce, including the training and support of generalists by specialist medical, nursing and allied health staff
3. Capturing and monitoring service activity and performance, including improved non admitted data collection
4. The promotion of home based dialysis and self-management as the 'first' treatment option for people requiring RRT when clinically and socially appropriate
5. Working in collaboration with primary care providers, including general practitioners, Aboriginal Controlled Community Health Services (ACCHSs) and other government and non-government providers to prevent, detect and manage CKD in the community to minimise the progression and consequences of CKD
6. Increasing Aboriginal participation in RRT, through identifying barriers to accessing services and increasing the cultural capability of renal services
7. The provision of treatment where appropriate at or closer to home
8. The development of patient centred, responsive and flexible renal services
9. The reduction of service costs to ensure cost effective care
10. The management of increasing demand through the identification of locally based need and investment in high priority renal services

The key strategies and actions identified for each focus area are aligned to the five strategic priorities of the *Western NSW LHD Strategic Health Services Plan*.

Priority 1: Develop a coherent system of care

Goal – Integrate and streamline renal services to ensure smooth patient journeys through efficient and effective renal care pathways.

Key Strategies

- Establish a coordinated and coherent system of care
- Retain and recruit a sustainable skilled renal workforce
- Capture renal service activity and performance

Priority 2: Support high performing primary health care

Goal – Undertake joint planning and action in partnership with primary health care providers such as the Medicare Locals and ACCHSs

Key Strategies

- Promote home-based dialysis and self-management as the 'first' treatment option when clinically and socially appropriate
- Work in collaboration with primary health care providers to prevent, detect and manage CKD in the community, aiming to minimise the progression and consequences of CKD

Priority 3: Close the Aboriginal health gap

Goal - Translate the NSW Aboriginal Health Plan into local action, in partnership with ACCHSs and Medicare Locals

Key Strategies

- Work in partnership with the Western NSW LHD Aboriginal Health Team and ACCHSs to increase Aboriginal participation in RRT
- Source, adopt and/or develop culturally appropriate designed educational resources to cover pre-dialysis, treatment modalities and preparation for treatment including education on pre-emptive transplant therapy
- In partnership with the Western NSW LHD Aboriginal Health Team, health service managers and dialysis units investigate the feasibility of expanding the role of the Aboriginal workforce to assist with pre-dialysis education, provide ongoing support to people dialysing at home and facilitate the transfer of pending patients to and from renal services
- Increase the number of Aboriginal people working in the specialist renal service, for example: renal nurses and renal Aboriginal Health Workers (AHWs)

Priority 4: Improve the patient experience

Goal – Ensure patients and their carers feel safe, respected and cared for, and involved in care planning and evaluation

Key Strategies

- Provide treatment at or closer to home
- Develop a patient centred, responsive and flexible renal service

Priority 5: Live within our means

Goal - Reduce service costs through improved productivity, and investment in high priority services

Key Strategies

- Reduce renal service costs and provide cost effective renal care
- Investment in high priority renal services – demand management

The Western NSW LHDs Renal Stream Committee has identified the following guiding principles to inform a preferred service model:

- A home therapies first policy
- Person-centred flexible care
- Maximise independence and minimise dependence
- Treatment at or closer to home
- Shared care working in collaboration with Aboriginal health workers, ACCHSs, general practitioners and primary and community health service providers
- Supportive organisational and clinical governance structures

2. Introduction

2.1 Background

The *Western NSW LHD Renal Services – Clinical Service Plan 2014 to 2018* has been developed to guide the development and delivery of renal services within the LHD. This plan will provide a foundation for decision making regarding the future development and sustainability of renal services.

A significant challenge for renal service planning in the Western NSW LHD is the size of the LHD and the distribution of its population. The projected increase in demand for renal services is also a challenge for service planning and delivery. This increasing demand highlights the need for higher level strategy development aimed at facilitating quality renal services that meet demand. To this end, the scope of this plan is expanded somewhat from the traditional service plan format.

2.2 Scope

The *Western NSW LHD Renal Services – Clinical Service Plan 2014 to 2018* encompasses all elements of renal services delivery including demand and issues likely to affect future provision of services. It describes the LHD renal services in detail, identifies the current service issues and challenges, and proposes strategies to improve efficiency, quality and performance. This Plan provides the pathways for the growth, development and improvement of the Western NSW LHD Renal Services for the next 4 years. This Plan has been informed by and is consistent with the planning for the redevelopments of the Lachlan Valley Health Service (including Forbes Health Service) and the Dubbo Health Service.

This plan provides a foundation for planning and coordinating equitable, accessible and timely renal service delivery from health promotion through to palliation. It is recommended that it be reviewed on an annual basis and an action plan be developed, monitored and implemented by the Western NSW LHD Renal Clinical Stream Committee.

2.3 Planning Context

The *Western NSW LHD Renal Services – Clinical Service Plan 2014 to 2018* is informed by a variety of strategic directions. Key amongst these is the *Western NSW Local Health District Strategic Health Services Plan 2013 - 2016*. In planning its future direction, the LHD has two fundamental imperatives - ensuring services are safe and of high quality; and reducing costs to live within funding. Against this backdrop, the LHD has adopted a strategy of *performance improvement* - to transform service delivery by lifting performance to best practice levels, and realignment of facility capacity in accordance with evolving requirements. The LHD's Strategic Health Services Plan (SHSP) presents five strategic priorities for the LHD over the next five years, and a three-year roadmap of actions for each. The SHSP's strategic priorities are, to:

1. Develop a coherent Western NSW system of care
2. Support high performing primary health care
3. Close the Aboriginal health gap
4. Improve the patient experience
5. Live within our means

The following enablers will support the attainment of these strategic priorities:

- Workforce capacity and capability
- Information services and technology
- Telehealth
- Transport and accommodation
- Partnerships and community development

- Working smarter

The NSW State Plan NSW 2021 informs the SHSP. The SHSP and the annual service agreement between the NSW Ministry of Health and the LHD then cascade into the Western NSW LHD Annual Operational Plan. Specific facility and service plans (such as this Plan) reflect the LHD's overarching strategic direction, and contribute to the LHD's success as measured by key performance indicators.

Other key reference documents that have provided guidance and direction in the planning process include, but are not limited to:

- Commonwealth of Australia, National Framework for Rural and Remote Health, November 2011
- NSW Government, NSW 2021: A Plan to Make NSW Number One
- NSW Ministry of Health, NSW State Health Plan – Towards 2021, 2014
- NSW Ministry of Health, NSW Rural Health Plan – Towards 2021, 2014
- NSW Ministry of Health, NSW Aboriginal Health Plan 2013-2023, December 2012
- NSW Department of Health Renal Dialysis Service Plan to 2011 – January 2007
- NSW Department of Health Chronic Disease Prevention Strategy 2003 – 2007
- NSW Department of Health Chronic Care for Aboriginal People Model of Care – September 2010
- NSW Department of Health Supporting Home-Based Dialysis – Report for the NSW Renal Planning Working Group – September 2008
- NSW Department of Health Kidney Health Check: Promoting the early detection and management of Chronic Kidney Disease (PD2010_023)
- NSW Agency for Clinical Innovation (ACI) NSW Chronic Disease Management Program – Connecting Care in the Community, Service Model 2013
- NSW Ministry of Health Population Health Priorities for NSW 2012-2017
- NSW Ministry of Health Palliative Care Strategic Framework 2010-2013

The *Western NSW LHD Renal Services – Clinical Service Plan 2014 to 2018* is informed by the NSW Governments health goals, directions and strategies as featured in the *NSW State Health Plan – Towards 2021*. The State Health Plan sets out the vision for the next stage of the public health system reform journey so NSW Health can keep providing 'the right care, in the right place, at the right time' for everyone in NSW. The State Health Plans goals are to:

- Keep people healthy and out of hospital
- Provide world class clinical services with timely access and effective infrastructure

The State's three Directions and four Strategies provide the framework for change:

- Direction 1: Keeping People Healthy
- Direction 2: Providing World-Class Clinical Care
- Direction 3: Delivering Truly Integrated Care
- Strategy 1: Supporting and Developing Workforce
- Strategy 2: Supporting and Harnessing Research and Innovation
- Strategy 3: Enabling eHealth
- Strategy 4: Designing and Building Future-Focused Infrastructure

The *NSW Renal Dialysis Service Plan to 2011* recognises the importance of a programmed response to this area of significant growth in demand for health services. It is intended to provide a clear direction for service development and resource allocation. The Plan will provide a foundation for planning and coordinating renal dialysis service delivery for equitable and accessible renal services within NSW to 2011. Issues of importance include:

- Scope of services
- Current service provision; distribution; capacity; support services
- Expected developments in the delivery of renal dialysis services
- Population growth and distribution
- End Stage Renal Failure incidence
- Future demand
- Optimal service models
- Network development and distribution of services, including outreach
- Workforce requirements

The *NSW Renal Dialysis Service Plan to 2011* defines the desired distribution of dialysis modalities, the Plan identified the need to develop strategies to better support home based dialysis and enable the achievement of the 50% home based dialysis benchmark. The NSW Renal Planning Working Party convened the Home-Based Dialysis Subgroup to address these issues. The final report, *Supporting Home Based Dialysis*, outlines the following recommendations with the aim to improve the uptake of and access to home-based dialysis:

- Facilitate the continued development of a culture where home-based dialysis is always the first treatment option
- Develop and disseminate accepted evidence-based guidelines to overcome the physical, social and psychosocial issues which may hinder home-based dialysis
- Provide the appropriate level of support to patients
- Support the development of training facilities closer to patients' homes and exercise caution with outsourcing training to private industry
- Provide access to a local outreach service and out-of-hours telephone service
- Provide patients access to a multidisciplinary team
- Provide staff access to high quality ongoing education
- Consider alternative models for offering home-based dialysis

The *NSW Chronic Disease Prevention Strategy 2003 – 2007* lays out the strategic principles of chronic disease prevention for NSW from a population health perspective emphasising primary prevention. It aims to harness the benefits and value-add to existing health promotion programs within the portfolios dealing with tobacco smoking, nutrition, alcohol consumption, physical activity and mental health promotion with management of psychosocial risk factors.

2.4 Overview of the Western NSW Local Health District

The Western NSW LHD provides health services to an estimated resident population of 271,468 people, which represents 3.8% of the NSW population. The LHD covers a large geographic area of 246,676 square kilometers, 31% of NSW. Most of the LHD's population is concentrated in the larger cities and towns, in the Bathurst Regional, Cabonne, Orange, Dubbo, Mid-Western Regional, Parkes, Forbes and Cowra Local Government Areas (LGA).

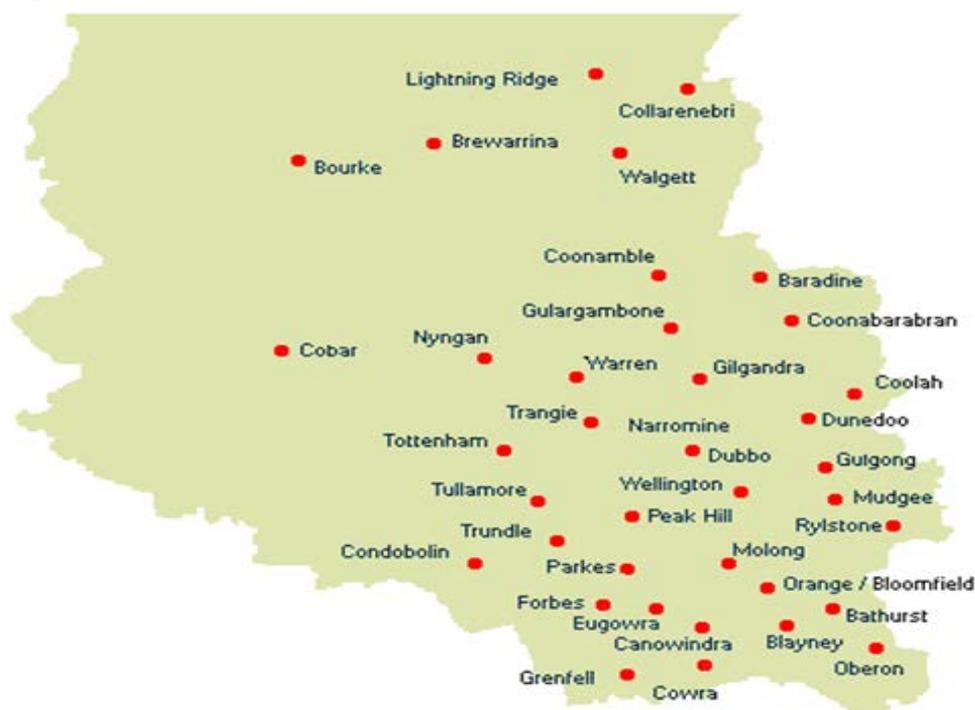
The Accessibility/Remoteness Index of Australia (ARIA+) is the endorsed measure of remoteness. ARIA+ is an unambiguously geographical approach to defining remoteness. It is a continuous varying index with values ranging from 0 (high accessibility) to 15 (high remoteness), based on road distance measurements from over 12,000 populated localities to the nearest

Service Centres in five categories based on population size. ARIA+ measures remoteness in terms of access along the road network from populated localities to each of five categories of Service Centre. Localities that are more remote have less access to service centres. Those that are less remote have greater access to service centres. Eight of the 23 LGAs that make up the LHD are classified as 'remote' by the ARIA + classification.

The Western NSW LHD operates a significant number of health services including 38 inpatient facilities with over 1,500 beds (locations of each facility are shown in Diagram 1). Approximately 85% of all public inpatient services required by residents living in the Western NSW LHD are provided by Western NSW LHD facilities. The majority of people receiving care outside of the LHD either live closer to major centres in other LHDs or States or require specialist care not provided within the LHD. There are 51 Community Health Centres located within the LHD providing access to a wide range of multidisciplinary primary and community health services.

Compared with other LHDs, the Western NSW LHD has a significantly high percentage of Aboriginal people (9.4% of the total population). This is significantly higher than the NSW average (2.5 %). The LGAs with the highest proportions of Aboriginal people are those in the northwest and remote areas of the LHD, for example: Brewarrina (59% of the population), Bourke (30%), Walgett (28%) and Coonamble (29%).

Diagram 1: The location of health facilities within the Western NSW LHD



Source: NSW Ministry of Health

Socio-Economic Indexes for Areas (SEIFA) is a product developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage. The indexes are based on information from the five-yearly Census. SEIFA 2011 is the latest version of this product and consists of four indexes:

- The Index of Relative Socio-Economic Disadvantage (IRSD)
- The Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD)
- The Index of Education and Occupation (IEO)
- The Index of Economic Resources (IER)

Each index is a summary of a different subset of Census variables and focuses on a different aspect of socio-economic advantage and disadvantage. The SEIFA score gives a broad definition of relative socio-economic disadvantage in terms of people's access to material and social resources, and their ability to participate in society. The SEIFA provides an objective measure of relative disadvantage of a particular area against the Australian average, as well as other areas. Factors such as household income, education and profession, household and dwelling size are used to determine an area's SEIFA. A low score indicates a more deprived area. A score of 1000 is set to the average for Australia. In the Western NSW LHD, most LGAs have scores below 1000. Socioeconomic status follows a declining trajectory from the eastern to northwest and remote areas of the LHD. The Cabonne LGA has the highest score at 1000.3 while the Brewarrina LGA has the lowest at 788.4.

2.4.1 The Population's Health

People living in rural and remote areas generally have worse health than people living in metropolitan areas. The reasons for this health differential includes geographical isolation, socio-economic disadvantage, shortage of health care providers, lower levels of access to health services, greater exposure to injury risks and poor health among Aboriginal people. Compared with people who live in 'major cities', people who live in 'remote' areas¹:

- Can expect to live about five fewer years
- Are more likely to die prematurely and from causes classified as 'potentially avoidable'
- Report greater difficulties in getting health care when they need it
- Are more likely to be hospitalised for conditions for which hospitalisation can be avoided through prevention and early intervention
- Are more likely to be overweight and obese
- Are more likely to die in motor vehicle crashes
- Are more likely to be hospitalised for heart disease

The Western NSW LHD and Western NSW Medicare Local (ML) in 2013 commissioned a 'whole-of-system' quantitative assessment of the health needs of the Western NSW population, the [Health Needs Assessment](#) (HNA). This document groups LGAs within Western NSW LHD into five areas; the Bathurst group (Bathurst Regional and Oberon LGAs), the Orange group (Blayney, Cabonne, Cowra, Forbes, Orange, Parkes and Weddin LGAs), the Dubbo group (Dubbo, Gilgandra, Mid-Western Regional, Narromine and Wellington LGAs), the North West group (Bogan, Coonamble, Lachlan and Warren LGAs) and the Remote group (Bourke, Brewarrina, Cobar and Walgett LGAs). It also compares data sets with NSW and adjacent areas of Murrumbidgee, Far West and the former New England LHDs. The following information is sourced from the HNA.

Mortality

People living in the Western NSW LHD have the shortest life expectancy at birth when compared to other LHDs, the exception being Far West LHD. Life expectancy is 76.5 years for men and 81.9 years for women. This is 2.5 years below the NSW average life expectancy. Life expectancy has steadily increased in Western NSW LHD between 1973 and 2007.

The Western NSW LHD also has a higher premature mortality rate than other rural NSW Areas – 325 per 1,000 people compared to 311 per thousand people. Premature mortality rises with increasing socio-economic disadvantage. The picture is similar for potentially avoidable mortality and is significantly higher than the NSW rate.

¹ NSW Health, The health of the people of NSW – Report of the Chief Health Officer. Summary Report, 2010

Aboriginal life expectancy at birth is not available at the LHD level. But at the NSW state level it is estimated to be 8.1 years less than that of non-Aboriginal people. Aboriginal males have a larger gap of 8.8 years compared to the Aboriginal female gap of 7.5 years. Whilst there has been a significant decline in mortality for non-Aboriginal people between 1998 and 2007, there has been little change for Aboriginal people. Mortality rates were 1.6 times higher in 1998 for males and 1.6 times higher for Aboriginal women. These rates rose to 2.3 times higher for males and 2.7 times higher for females in 2007.

The causes of premature mortality in Western NSW LHD reflect those of NSW as a whole. Around one third are due to cancer, a quarter are due to circulatory diseases, 10% due to injury and 7% due to respiratory conditions.

Morbidity

Whilst high levels of chronic disease and risk factors for chronic disease are prevalent throughout the region, those communities with higher Aboriginal population proportions tend to have significantly higher rates. Diabetes is a major factor in the excess burden of disease among Aboriginal people and contributes to the health gap between Aboriginal and non-Aboriginal people. The onset of diabetes occurs earlier among Aboriginal people, resulting in a greater burden of illness associated with complications such as renal and cardiovascular disease. Aboriginal people are more than three times as likely as non-Aboriginal people to die as a result of diabetes. It is estimated that 10.7% of the population in the north-west area of Western NSW have been identified as being diagnosed with diabetes. This figure is significantly higher than the rest of the Western ML, NSW and Australia.

The Chief Health Officer of NSW's report into the health of Aboriginal people noted a 58% higher rate of cardiovascular hospitalisations for Aboriginal people in 2010/11. In the past 10 years there has been a significant increase in rates of cardiovascular disease hospitalisations for Aboriginal people, and a significant widening in the health gap between Aboriginal and non-Aboriginal people.

Based on estimates derived from self-reported cardiovascular disease from the Health Survey, 20% of the population of Western NSW aged 15 and over has existing disease. This is markedly higher than the NSW average. Within Western NSW the Bathurst grouping of LGAs has a significantly lower proportion of people with cardiovascular disease, while the Orange group and the North West group have a significantly higher proportion. Diabetes and cardiovascular disease are important in the sense they make up over 80% of all premature mortality and in the sense that they are potentially preventable.

Just over 10% of the Western NSW population report having asthma ranging from 10.1% in the Bathurst group to 11.5% in North West group and 11.4% in the Remote group. The Western NSW is similar to Rural NSW, but significantly higher than NSW as a whole. The Western NSW rate of self-reported Chronic Obstructive Pulmonary Disease (COPD) of 6.4% of all adults aged 45+ is the same as Rural NSW, but significantly higher than the NSW rate of 5.7%. Within Western NSW the gradients follows that of smoking prevalence, lowest in the Bathurst group of LGAs and highest in the Remote group of LGAs

Key Risk Factors

The risk factors identified as the main drivers for ill health for the people in Western NSW are:

- **Tobacco smoking**

In Western NSW LHD, 22% of people aged 18 and over were estimated to be smokers, a significantly higher proportion than in NSW as a whole, but similar to the rural NSW average. Within Western NSW Bathurst and Orange were significantly lower than the Western NSW average, while the North West was significantly higher. To get to the NSW rate of 18.8% over 6,000 smokers would need to quit – 15% of the current smoking cohort.

- **Obesity**

Based on modelled data from the Australian Health Survey, 43,000 or 21% of Western NSW adults aged 18+ would be defined as obese, which is having a Body Mass Index (BMI) of 30 or more. The Western NSW is similar to the other rural NSW areas, but is significantly heavier than the state average of 18%. Within Western NSW the Bathurst area is significantly lower (similar to the NSW rate), while Dubbo, North West and Remote areas are all significantly higher. To get to the NSW rate over 5,000 people would need to lose weight below the 30 BMI thresholds – 12% of the current obese cohort.

- **Physical inactivity**

Physical inactivity is defined as those aged 15 years and over who did not exercise in the two weeks prior to interview for the 2007–08 Health Survey, through sport, recreation or fitness (including walking). Overall 37.7% of the Western NSW population fell into this category, slightly less than other rural NSW areas, but significantly higher than the NSW average of 33.4%. Within Western NSW the Bathurst area is significantly lower (even lower than the NSW rate), while Dubbo, and North West areas are all significantly higher. To get to the NSW rate over 9,000 of the 83,000 people currently not exercising would need to start.

- **Harmful use of alcohol**

Alcohol harm is defined based on the amount and times drinking in the week prior to interview for the 2007–08 Health Survey. Overall 7.7% of the Western NSW population fell into this category, similar to the aggregate total of the other rural NSW areas, but significantly higher than the NSW average of 5.4%. Within Western NSW the pattern is the reverse of that seen for the other risk factors discussed above, with the Bathurst area having significantly higher rates of harmful drinking, while the North West and Remote areas report significantly lower rates of harmful drinking.

Some of the priority areas identified by the HNA where health care interventions are likely to give the greatest benefits to the LHD's population include:

- Smoking prevention and cessation
- Nutrition and physical activity interventions, including obesity prevention
- Diabetes prevention and management
- Well child care, particularly for Aboriginal children - the first 1000 days
- Mental health - continuing and strengthening the current community services

2.4.2 Challenges

The LHD faces a range of challenges common to LHDs operating in rural and regional environments. These are listed in Table 1.

In addition, the LHD faces some unique challenges. Performance is variable against the national and NSW Ministry of Health performance indicators for which it is accountable. Benchmarking across organisations suggests the LHD can make material performance improvements in key areas of resource use, such as average length of stay (ALOS) and potentially preventable hospitalisations (PPH). For example, if the LHD were to move to the rural and regional LHD average for PPH, it would have approximately 10,000 fewer hospitalisations per year. Overall, the LHD currently has the second highest rate of hospital beds per 1,000 people in NSW.

Looking out to 2030, if current clinical practice patterns continue, then an increase of 21% in hospitalisations and 33% increase in bed-days can be expected. However, only a small shift in utilisation rates and length of stay would change these projections significantly. A reduction in ALOS and PPH to benchmark levels would remove the need for any hospital capacity increase.

Table 1: Summary of challenges facing the Western NSW health system

Challenge	Factors
Demography	Population ageing brings increasing service demand Continuing migration - west to east; north to south; 'remote to regional' Increased Aboriginal share of the population, and their health needs Lifestyles and obesity will increase demand
'Closing the gap' of Aboriginal health	Engagement and partnerships Social determinants Prevention and 'upstream' solutions Cultural awareness, responsiveness and competence
Community expectations	Building awareness of rationale for service changes associated with contemporary models of care Low health literacy Addressing new or growing needs, e.g. drug & alcohol; suicide; bariatric surgery Meeting the expectations of the 'baby boomers'
Geography	Sparse population, with large distances between communities Working with local communities Patient and health professional transport
Service configuration	Inequity of access across the district Absence of an agreed 'system of care' with corresponding patient flows Lack of service integration across primary, community and specialist services, especially in rural and remote areas Lack of a population health outcome focus
Workforce	Age structure Maldistribution ('inverse care law') Recruitment and retention in rural and remote areas Sub-specialisation Reliance on locums Poor coordination of specialist outpatient planning
Funding	Delivery costs increasing faster than funding Scale of the District financial deficit Diversity of funding sources (Commonwealth/State; fee-for-service/program) works against best use of resources Activity based funding (ABF) risks distortion of best practice models of care Capital development may worsen financial performance
Facilities	Number of rural and district facilities, and their suitability for future roles and capacity Affordability of upgrades
Information and communications technology	Sharing of clinical information across practitioners, providers and sites Bandwidth limits to remote 'virtual' care (telehealth) Cost-effectiveness

Source: Western NSW Local Health District Strategic Health Services Plan 2013 - 2016

3. Renal Disease in the Western NSW LHD

Renal disease is the progressive loss of kidney function. Renal disease or Chronic Kidney Disease (CKD) is classified into five stages, which are defined by the estimated renal function of glomerular filtration rate (GFR), from kidney damage with no loss of kidney function, to severe loss of kidney function. However, it is often not until kidney function has deteriorated into the fifth stage, known as end-stage kidney disease (ESKD) that a problem is detected. ESKD, or stage 5 CKD, is defined as an irreversible condition with >85% deterioration of renal function. Clients with ESKD in Australia usually commence dialysis when GFR is around 7% of normal (or GFR <15), or earlier if symptoms require².

Causes of ESKD include glomerulonephritis, diabetic nephropathy, and hypertension, which account for the majority of cases. CKD resulting from diabetes or hypertension is potentially preventable and future efforts should focus on strategies that aim to prevent or postpone the onset of ESKD as a result of diabetes and hypertension. Treatment currently available for ESKD is renal dialysis or kidney transplantation. Kidney transplantation is considered the optimal therapy for better outcomes, but only 25% of ESKD clients are eligible. The majority of people with ESKD will require renal replacement therapy (RRT) or dialysis to survive. Renal dialysis is the process of diffusing blood across a semi-permeable membrane to remove substances that a normal kidney would eliminate and to maintain the body's chemical and fluid balance. There are several different methods or 'modalities' of dialysis and means of delivering these therapies. RRT can be achieved through either:³

- Transplantation - the most cost effective and efficient form of replacement
- Haemodialysis (HD) - in the hospital or home
- Peritoneal dialysis (PD) - continuous ambulatory or automated in the hospital or home

There are two renal dialysis treatment modalities: haemodialysis (HD) and peritoneal dialysis (PD). These therapies can be delivered by different methods and locations, ranging from high dependency in-hospital care (provided by an in-centre unit) to independent home self-care RRT such as home HD or PD. Renal dialysis, is the most common reason for hospitalisation in Australia, and consequently is responsible for a large amount of health expenditure. Moreover, it greatly affects the quality of life of patients.⁴

Kidney Health Australia states that CKD is a significant and growing public health problem, responsible for substantial burden of illness and premature mortality. CKD has numerous risk factors, a complex aetiology and a wide range of associated co morbidities. Kidney Health Australia reports that 1 in 3 Australians is at an increased risk of developing CKD. Adult Australians are at an increased risk of CKD if they:

- Are 60 years or older
- Have diabetes
- Have a family history of kidney disease
- Have established heart problems and/or have had a stroke
- Have high blood pressure
- Are obese (BMI - more than or equal to 30)
- Are a smoker
- Are of Aboriginal or Torres Strait Islander origin

² Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) *Thirty-Fifth Annual Report (2012)*

³ Government of Western Australia, Department of Health *WACHS Renal Dialysis Plan 2010 to 2021, Final Version 1 October 2010*

⁴ Australian Institute of Health and Welfare (AIHW), *Projections of the Incidence of treated end-stage kidney disease in Australia 2010-2020, 2011.*

3.2 Incidence and Prevalence⁵

The Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) *Thirty-Sixth Annual Report (2013)* states, that for all new patients commencing RRT in 2012, the primary causes of ESRD in Australia were diabetic nephropathy (36%), glomerulonephritis or inflammation of the kidney (19%) and hypertension (12%). The Report identifies that:

- 2,534 people started RRT (dialysis or transplant) in 2012, 786 in NSW
- 20,756 people were receiving RRT (dialysis or kidney transplantation) at the end of 2012, 6,347 in NSW. This represents a National increase of 6.6% from 2011
- 22% of people who begin RRT are referred 'late' to a nephrologist - i.e. less than 3 months before beginning treatment
- In Australia, late referral is more common among people of Pacific Island (29%), Indigenous Australian (29%) or Maori (26%) origin, compared with the Caucasian population (22%)
- A total of 11,446 people were receiving dialysis treatment at the end of 2012, 3,707 in NSW. This presents a National increase of 4.1% from 2011
- Of all people on dialysis, 29% dialyse at home
- Dialysis treatments at the end of 2012:
 - 8% use Continuous Ambulatory Peritoneal Dialysis (CAPD)
 - 12% use Automated Peritoneal Dialysis (APD)
 - 9% use Home HD
 - 71% use satellite or hospital dialysis
- 845 kidney transplant operations were performed in Australia in 2012, 247 in NSW
- A total of 9,320 Australians were alive as a result of a functioning kidney transplant at the end of 2012 - this represents a 9.8% increase from 2011.
- As at 3 February 2014 - 1,087 people were waiting for a kidney transplant in Australia.
- 73% of people on the waiting list are aged less than 60 years, and 79% are waiting for their first transplant.
- The average waiting time for a transplant is about 3.5 years, but waits of up to 7 years are not uncommon.
- The survival rate following a kidney transplant is high - 98% of recipients are alive at 1 year and 89% are alive at 5 years.

The *36th Annual ANZDATA Report 2013* indicates that the National mortality rate per 100 patient years was 12.7 for people dependent upon dialysis and 1.8 for those with a functioning kidney transplant. Of the 1,467 deaths among people dependent upon dialysis in 2012: 33% were due to withdrawal from treatment, 32% due to cardiovascular disease and 11% were due to infection. In Australia there has been a steady improvement in the mortality rates in most age groups over time. Mortality rates for people dependent on dialysis are higher for older people and people with diabetes or cardiovascular disease.

The high mortality rate for people dependent upon dialysis highlights the importance of holistic multidisciplinary care and the management of existing co-morbidities. Many people with renal disease have co-morbidities such as cardiovascular disease, diabetes, hypertension, anaemia and malnutrition. These conditions are frequently related to the underlying causes of renal disease but also increase the consequences of decreasing renal function. Late presentation for identification and treatment only serve to exacerbate the severity of these co-morbidities.

⁵ Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) *Thirty-Sixth Annual Report 2013*

There were a total of 171 people receiving dialysis within the Western NSW LHD in April 2014. Details, including population characteristics and a breakdown of dialysis modalities, for the Western NSW LHD dialysis population (as at the end of April 2014) are listed below:

- 34.5% of the total dialysis population were of Aboriginal background
- 31.6% of the total dialysis population were of 70 years or over
- 115 people were receiving hospital-based dialysis (67.2% of the dialysis population)
- 56 people were receiving home-based dialysis (32.8% of the dialysis population)
- 56 were receiving HD at the Level 5 HD Units – Orange and Dubbo, 33.8% of the dialysis population
- 34 were receiving HD at Level 4 Bathurst and Level 3 Forbes Units, 19.9% of the dialysis population
- 25 were receiving HD at facility-based units, 14.6% of the dialysis population
- 8 were receiving home HD, 4.7% of the dialysis population
- 48 were receiving home PD, 28.1% of the dialysis population

3.3 Projections⁶

The Australian Institute of Health and Welfare (AIHW) predict that the incidence (number of new cases) of treated ESKD is projected to continue to rise over the next decade at the national and state/territory levels, for both sexes and across most of the age groups, and for those with diabetes. National projections identify that:

- Incidence rate of treated ESKD is projected to increase by nearly 80%, from 11 per 100,000 population in 2009 to 19 per 100,000 population in 2020. The increase is projected to be mainly among patients aged 70 years and over
- Diabetes is expected to contribute considerably to the increase in treated ESKD. The proportion of patients commencing treatment with diabetes is projected to increase to about 64% in 2020 from 45% in 2009

The AIHWs State/Territory level projections identify that:

- Incidence rates are projected to increase in all jurisdictions from 2009 to 2020; however, the rate of increase differs slightly. The incidence of treated ESKD in NSW/ACT is projected to rise consistently over the next 11 years
- In 2009, the total incidence rate of registered treated ESKD in NSW/ACT was 10 per 100,000 population, expected to increase by about 80% to 18 per 100,000 population in 2020

The number of people in NSW requiring dialysis and kidney transplant services over the past decade has grown significantly and this increase in demand is projected to continue. An ageing population, increasing diabetes prevalence and the heavy burden of chronic disease (especially in Aboriginal and Torres Strait Islander Australians) have combined to place renal services under intense demand and capacity pressure. Evidence suggested that renal service planning should take into account the strong likelihood that demand will continue to rise over the next decade.⁷

⁶ Australian Institute of Health and Welfare (AIHW) *Projections of the Incidence of treated end-stage kidney disease in Australia 2010-2020*, 2011.

⁷ Queensland Government, *Queensland Statewide Renal Health Services Plan 2008-17 Part One The Way Forward*

There was a 62.1% growth in the number of people receiving dialysis in the former Area Health Service (AHS) between 2001 and 2010 (an average of 10% per year). This number is higher than the projected NSW rate of 5%. The Western NSW LHD is expected to have experienced a similar growth rate. Factors impacting on the higher prevalence of renal disease within the Western NSW LHD include⁸:

- The ageing population
- The lower socioeconomic status
- The high proportion of Aboriginal people
- The higher prevalence of risk factors – higher smoking rates, higher levels of obesity, cardiovascular disease and diabetes

The NSW Ministry of Health predict an average annual percent increase of 4.7% across NSW of the prevalence of dialysis patients and that this may actually be even higher than this at 6% per annum for the more rural and remote areas⁹. It is anticipated the Western NSW LHD will experience a higher growth rate in the number of people requiring dialysis and the associated support services; this Plan addresses this very significant health issue.

⁸ NSW Health, *NSW Renal Dialysis Service Plan to 2011*, January 2007

⁹ NSW Health, *Revised Projections of Demand for Renal Dialysis Services in NSW to 2021*, August 2009

4. Renal Services Profile

The Western NSW LHD renal services may be subdivided into two service networks, the Northern Sector Renal Service and the Southern Sector Renal Service. The profile of services within each sector includes hospital based HD units complemented by pre-dialysis services including renal outpatient clinics, access surgery and home training. Renal outreach services are also provided to support people living in the community with CKD and people who are dialysing at home.

4.1 Pre-Dialysis Services

People with CKD are referred to a nephrologist by their general practitioner (GP). Appropriate people are then referred to the pre-dialysis services. As recommended by *the Caring for Australians with Renal Impairment (CARI) Guidelines*,¹⁰ the process of managing the transition of patients from medical therapy onto RRT in the Western NSW LHD is facilitated by:

- Maintaining a database that identifies people with advanced CKD who are approaching RRT. Provides a mechanism for tracking changes in the renal function in these people.
- Initiation of a pre-dialysis education program for people nearing the commencement of dialysis, incorporating information about the treatment options available, interventions required for the management of advanced CKD, psychosocial and surgical preparation for RRT, home therapies training and transplantation services
- Initiation of protocols for management of people approaching RRT with particular emphasis on timely referral for creation of dialysis access or pre transplant assessment where relevant

Pre-dialysis education involves the provision of information about renal disease, options for the management of CKD prior to dialysis (including pharmacological and dietary management) and the options for RRT. This initial consultation can take up to two hours and family members and significant others are encouraged to attend. Resources are provided during pre-dialysis contact to promote home-based therapies, in particular PD, as the first treatment option.

The Dubbo Renal Unit Nurse Manager (NM) and other senior staff provide pre-dialysis education for the Northern Sector Renal Service. There are currently 80 individuals registered on the Northern Sector pre-dialysis database. Pre-dialysis education for the Southern Sector Renal Service is provided by the Renal Clinical Nurse Consultant (CNC) at the renal unit closest to the patient's home (Orange, Bathurst or Forbes). During pre-dialysis education all people with stage 4 and 5 CKD are venous mapped for arm preservation for future access. There are currently 150 individuals registered on the Southern Sector pre-dialysis database.

Home-based dialysis modalities are promoted as the first treatment option but ultimately the choice of dialysis modality depends on many factors, including the availability of resources, place of residence and environmental factors, age, family support, and overall health and lifestyle factors. Whilst home HD is a cost effective dialysis modality and encourages client autonomy, it does require specific conditions such as access to good, safe and reliable water and electricity supplies, a suitable home environment and the availability of a carer. Treatment in a hospital setting is not the preferred option as the clinical environment can raise expectations about the provision of clinical care required, and may lead to people becoming less confident in managing their own care.

Home-based Dialysis Training - HD and PD

The Home Training Unit at Dubbo provides home-based HD and PD training. The Outreach Teams' nursing staff provide the PD training and the Renal Clinical Nurse Specialist (CNS)

¹⁰ Kidney Health Australia, The CARI Guidelines – Caring for Australians with Renal Impairment *Acceptance onto Dialysis Guidelines, Pre-dialysis education, June 2005*

provides the home HD training. The training unit is located within the Dubbo HD Unit and consists of a single room and some office space. Without this unit, people suitable for home dialysis would need to travel to Sydney to access training. The Home Training Unit, which became operational in 2008, provides training for approximately 12 people per year. Hostel accommodation for people accessing the training unit is subsidised by the Isolated Patient Transport and Accommodation Scheme (IPTAAS). The testing of PD patients by use of the Peritoneal Equilibration Test (PET) is also attended in the Home Training Unit and further training in automated PD occurs for those whose PET indicates a need to change.

The Orange Unit has a Home Training Room and currently the PD Outreach Registered Nurse (RN) provides PD training and PETs. The Unit has not commenced home-based HD training. Currently home HD training for people from the Southern Sector catchment is performed by the Sydney Dialysis Centre (SDC) at the Royal North Shore Hospital (RNSH) in Sydney.

Access Surgery

Dialysis access surgery is provided by surgeons at the Dubbo and Orange Health Services by way of planned monthly theatre lists. Dubbo provides access surgery two days per month and Orange one day per month. The dedicated theatre time is allocated for the insertion of PD catheters, central lines and the formation and repair of arterio-venous (AV) fistulas for vascular access. Inpatient data for the past five years identifies an average of 35 dialysis access surgical cases per year across the LHD¹¹. People are referred to metropolitan hospitals for more complex access formations and for those requiring high level interventions on established fistulas and grafts.

4.2 Haemodialysis Units - Hospital Based¹²

The configuration of the Western NSW LHD hospital-based HD services includes two Level 5 HD units (commonly known as in-centre units), one Level 4 HD unit, one Level 3 HD unit (commonly known as a satellite unit) and 10 facility-based (self and/or non-self-care) units.

4.2.1 Level 5 Haemodialysis Units

The two Level 5 HD units are located at the Dubbo and Orange health services. Table 2 shows the number of chairs, current patient capacity, nursing staff expressed as full time equivalents (FTE) and the operational shifts within these two units.

Table 2: Western NSW LHD Level 5 HD units

Unit	No. of Chairs	No. of Patients	Staffing (FTE)	No. of Shifts per week
Dubbo	10	30	12.79	2 shifts - Mon, Wed, Fri 2 shifts – Tues and Thurs 1 shift – Sat and Sun <i>Total of 12 shifts per week</i>
Orange	14	30	10.85	2 shifts - Mon, Tues, Wed 2 shifts - Thurs, Fri, Sat <i>Total of 12 shifts per week</i>

**As at end of April 2014*

The Northern Sector Renal Service

The Dubbo Level 5 Renal Unit is the hub of renal service delivery providing a specialist service to the Northern Sector of the LHD. The Northern Sector Renal Service provides a mixture of specialist services to its catchment area including: pre-dialysis medical care and education; access surgery; in-centre dialysis services; emergency dialysis; initiates dialysis; home modalities training; staff training; clinical support to the facility-based sites and a renal outreach

¹¹ NSW Ministry of Health, FlowInfo V13

¹² NSW Health, Guide to the Role Delineation of Health Services – Third Edition 2002, Statewide Services Development Branch

service that supports people dialysing at home and in the smaller rural facility-based dialysis units. Features of the Northern Sector Renal Service are listed below:

- Induction training for new renal nurses is performed at either the Dubbo Unit or the relevant facility-based unit by the Dubbo staff. Training lasts three weeks but duration is flexible according to the trainees' needs. Experienced registered nurses (RNs) and clinical nurse specialists (CNS) are available to assist with staff training. Competency-based assessments are completed at the end of the induction period
- Acute HD is provided by the senior dialysis staff in either the dialysis unit or ICU
- In-centre staff provide consultation/liaison support to the facility-based units and home dialysis (including those in residential aged care facilities) in their catchment area
- PD and HD are initiated at the Dubbo Unit by senior staff
- There is no formal on-call service provided. A renal specialist can call in senior staff after hours to perform acute dialysis if deemed necessary
- The unit operates with individual portable reverse osmosis (RO) water plants attached to each HD machine
- The Northern Sector Renal Service has traditionally had the home and facility-based dialysis costs funded through the Royal Prince Alfred Hospital (RPAH). However now all patients are funded by the Western NSW LHD, apart from the three home HD patients who remain funded and supported through the SDC

Table 3 summarises the workforce profile for the Dubbo Unit. The Renal Registrar is included as part of the hospital registrar program from metropolitan hospitals. The NM has a dual role - 0.5 FTE is managing the unit and 0.5 FTE is a renal outreach nurse.

Table 3: Dubbo Level 5 Renal Unit – Workforce Profile

Position	FTE
Renal Physician / Nephrologist (Specialist)	2.0
Renal Registrar	1.0
Nurse Manager (NM)	0.5
Clinical Nurse Specialist (CNS)	1.7
Clinical Nurse Educator (CNE)	1 – <i>Currently vacant</i>
Renal Outreach Nurse	1.5
Renal Dietician	1.0
Registered Nurses (RN)	4.11
Endorsed Enrolled Nurses (EEN)	2.24
Ward Clerk	1.0
Total	15.05

* As at September 2014

At the end of April 2014, the majority of the people (63%) receiving dialysis at the Dubbo Unit were residents of the Dubbo LGA. The remaining 37% travel for treatment from the surrounding LGAs including Nyngan, Wellington, Brewarrina, Narromine, Peak Hill, Walgett and Warrumbungle.

Table 4 provides a breakdown of the Northern Sector Renal Services dialysis population by modality compared to State targets. In April 2014, 57.1% were receiving hospital based HD and 42.9% were receiving home based RRT. The overall figure for home based dialysis is below the State benchmark while the figure for home PD is above the State benchmark.

Table 4: Northern Sector Renal Service Activity by RRT Modality

Dialysis Modality	No. of Patients	%	NSW Benchmarks
Facility-Based	52	57.1%	50%
In-centre	27	29.7%	20%
Satellite	-	-	30%
Facility	25	27.5%	-
Home-Based	39	42.9%	50%
Home HD	3	3.4%	20%
Home PD	36	39.6%	30%
Total	91	100%	100%

* As at end of April 2014

The Southern Sector Renal Service

The Orange Health Services Level 5 Renal Unit is the hub of renal service delivery in the Southern Sector of the LHD, providing clinical support and outreach services that complement the services provided by the Bathurst and Forbes HD Units and support to people dialysing at home. The Orange Unit is primarily linked to the SDC for home HD training. The Orange Unit funds the PD consumables for people performing PD at home.

The Orange Unit has 14 chairs and a home training room. Each chair and the training room have a port connected to a central RO. There is also a port in the equipment storeroom that acts as a maintenance port. An additional seven ports are available to perform HD within the critical care and acute inpatient areas of the hospital. Features of the Southern Sector Renal Service are listed below:

- Induction training for new renal nurses is performed within the unit in which they are employed. The trainees commence a structured training program and are expected to complete competency-based assessments throughout the induction period. The renal CNC and at times, the unit CNSs perform the competency-based assessments
- Acute HD services are provided at the Orange Health Service by the senior dialysis staff and can be performed in either the dialysis or intensive care unit. The Unit offers both HD and limited hemodiafiltration (HDF) dialysis treatment options
- The Unit holds a vascular ultrasound access clinic once a month, coordinated and attended by the Renal CNC. The clinic involves the person receiving dialysis and their family, a surgeon from Westmead and a sonographer. People are referred to the clinic for review of problematic vascular access, identification of need for early intervention and follow up as requested by the surgeon
- Once dialysis access has been created RRT is commenced, be it PD or HD
- Once HD treatment is established and the dialysis patient is deemed medically stable and suitable for transfer to receive treatment in a Level 3 or 4 unit closer to their home
- The Unit operates with a large pre-treatment reverse osmosis (RO) water plant which supplies water to each of the 14 dialysis ports, the one training room port as well as additional ports located in the critical care and acute inpatient areas
- The Unit does not offer an on-call renal nursing service. Renal Specialists can request urgent after hours dialysis and staffing. This is arranged by either the Campus NM or Nurse Unit Manager (NUM)
- The Renal Specialists provide a 24 hour, seven day a week on-call service for relevant admissions and consultation
- Renal Specialists provide twice weekly medical renal clinics in Orange, which include the initial review of new referrals and the three monthly reviews of existing patients. People reviewed at these clinics include people dialysing at home (HD and PD); people receiving hospital based HD, those requiring pre-dialysis education and transplant

recipients. Those attending for pre-dialysis management of their CKD account for 60% of the total people reviewed at these clinics

- The Renal Specialists also conduct renal ‘walk-in’ clinics five days a week for new transplants, urgent referrals and discharge follow-ups

Table 5 details the workforce profile for the Orange Unit.

Table 5: Orange Level 5 HD Unit – Workforce Profile

Position	FTE
Renal Physician	2.3
Outreach Clinical Nurse Consultant (CNC)	1.0
Nurse Unit Manager (NUM – Level 1)	1.0
Peritoneal Outreach Nurse	1.0
Renal Dietician	1.0
Clinical Nurse Educator	0.53 – <i>Vacant</i>
Clinical Nurse Specialist	0.63
Registered Nurses (RN)	6.22
Total	13.68

* As at September 2014

At the end of April 2014, the majority of people dialysing at the Orange Unit (76%) were from the Orange LGA. The remaining 24% were people travelling from neighbouring LGAs to receive RRT, including from Bathurst Regional LGA, Cowra LGA, and Blayney LGA.

Table 6 provides a breakdown of the Southern Sector Renal Services dialysis population by modality compared to the State targets. In April 2014, 78.7% of people were receiving hospital based HD and 21.3% were receiving home based RRT. The figure for home based dialysis is significantly below the State benchmark of 50%.

Table 6: Southern Sector Renal Service Activity by RRT Modality

Dialysis Modality	No. of Patients	%	NSW Benchmarks
Facility-Based	63	78.7%	50%
In-centre	29	36.2%	20%
Satellite	34	42.5%	30%
Home-Based	17	21.3%	50%
Home HD	5	6.3%	20%
Home PD	12	15.0%	30%
Total	80	100%	100%

* As at end of April 2014

4.2.2 Level 4 Haemodialysis Unit

The Bathurst Health Service operates a Level 4 HD Unit with six chairs operating 12 shifts per week. The Unit is situated within the main medical ward and is adjacent to the Intensive Care Unit (ICU). The Bathurst Health Service employed a fulltime renal physician in November 2012. This appointment along with the recruitment of anaesthetist/intensivists has increased the capability of the renal service. The Bathurst unit can initiate dialysis for medically stable patients, provide acute dialysis for existing renal patients and planned holiday dialysis. The renal physician provides specialist support to the dialysis unit and hospital medical renal outpatient clinics and a specialist on call service during office hours Monday through to Friday for GPs. The renal physician also participates in the health services medical on call roster.

The Unit has a senior renal CNS who provides on-site staff and patient education, staff competency assessments and the overall coordination of the Unit and clinical issues. The Bathurst Unit has a formal link with the Orange Level 5 service for the provision of higher level renal services and outreach services. Extremely unwell people may require transfer to the

Orange Unit or a Level 6 Unit in a tertiary referral hospital for higher acuity care. Table 7 shows the number of chairs, patient capacity, nursing FTE and the current number of shifts at the Bathurst HD Unit.

Table 7: Bathurst HD Unit

Unit	No. of Chairs	No. of Patients	Nursing Staff	Number of Shifts
Bathurst	6	24	5.47 FTE	2 shifts (am and pm) - Mon, Wed, Fri 2 shifts (am and pm) - Tues, Thurs, Sat 12 shifts per week

* As at the end of April 2014

In April 2014, the majority of people dialysing at the Bathurst Unit were from the Bathurst Regional LGA (87% of patients) the remaining 13% of patients were travelling from the neighbouring LGAs (Oberon and Mid-Western Regional) for treatment. Table 8 details the workforce profile for the Bathurst Unit.

Table 8: Bathurst Level 4 HD Unit – Workforce Profile

Position	FTE
Renal Physician	1.0
Nurse Unit Manager (NUM – Level 2) Medical Ward and Renal Dialysis	1.0
Clinical Nurse Specialist - Level 2	1.0
Registered Nurses (RN)	1.82
Endorsed Enrolled Nurses (EEN)	2.82
Total	7.64

* As at October 2014

4.2.3 Level 3 Haemodialysis Unit

The Forbes Health Service has a Level 3 HD Unit (commonly known as a satellite unit) with six chairs operating six shifts per week. The Unit is to be expanded to eight chairs in 2015 when the Lachlan Health Service undergoes redevelopment. The Forbes Health Service does not have a resident renal physician or intensive care service. The unit is also disconnected from the main acute inpatient areas of the hospital. Therefore the Forbes Unit does not initiate dialysis, provide holiday dialysis or provide after hours or on call services for emergency dialysis.

People eligible for HD in the Forbes Level 3 unit have their treatment initiated at the Level 5 Unit at Orange. When they are assessed to be stable by the Orange renal team and they meet the criteria for treatment in a satellite unit, patients are transferred to the unit closest to their home. If they become medically unwell throughout their treatment they are aware they may need to be transferred to Orange for higher acuity care.

The Forbes unit has a senior renal CNS who provides on-site staff and patient education, staff competency assessments, coordinates the activities of the unit and manages clinical issues. Table 9 shows the number of chairs, patient capacity, nursing FTE and number of shifts.

Table 9: Satellite Dialysis Units within the Western NSW LHD

Unit	No. of Chairs	No. of Patients	Nursing Staff	Number of Shifts
Forbes	6	12	2.47 FTE	1 shift (am) - 6 days per week 6 shifts per week

* As at the end of April 2014

In April 2014, the majority of people dialysing at the Forbes Unit were from the Cowra LGA (27 %) and Parkes LGA (27%). The remaining patients were from the Forbes, Lachlan and Weddin LGAs.

4.2.4 Facility-Based Units

The Western NSW LHD provides a unique RRT option in the form of facility-based (self and/or non-self-care) dialysis service. This alternate dialysis modality was established due to patient and community demand for people to receive treatment closer to home. Within the Western NSW LHD there are currently 10 health services providing this type of HD service to a total of 25 people, 14.6% of the total LHD renal dialysis dependent population. The majority of the health services providing this service are small rural facilities or Multipurpose Health Services (MPSs). All the facility based units are situated in the Northern Sector of the LHD, are supported by the Dubbo Level 5 Renal Service and are part of the Northern Sector Renal Service.

The target group for this type of dialysis service are people who are assessed to be medically stable, self-caring or requiring limited care and therefore need only minimal assistance. However, these centres often provide treatment for people who would be categorised as suitable for 'satellite' dialysis. Staff at the local health services are trained and supported by the senior staff of the Dubbo Renal Service.

The chairs located at these units are allocated to specific patients and there was previously no scope to share or relocate these machines. This limits treatment capacity but serves to extend the life of the machine. More recently, in response to the local demand for this service at Walgett, the Northern Sector Renal Service successfully negotiated with the SDC, the flexible use of the existing HD machines located at the Walgett Unit. This has resulted in an increased treatment capacity at Walgett, there are now eight people receiving treatment and unit is operating six shifts per week.

As at April 2014 there were 25 people being dialysed in facility-based units across the LHD. Of these people only one is capable of 'true' self-care and the remaining 24 require significant nursing intervention with machine set up and the obtainment of vascular access (cannulation). Table 10 provides a summary of activity at the facility-based units.

Table 10: Facility-based sites within the Western NSW LHD

Facilities	No. of Dialysis Ports	No. of HD machines on-site	Comments
Bourke MPS	2	1	
Brewarrina MPS	6	6	Spare machine located on-site for breakdowns due to isolation from technical support
Cobar	2	0	Currently no clinical need
Coonabarabran	2	0	Currently no clinical need
Coonamble MPS	3	3	
Gilgandra MPS	2	1	
Mudgee	2	2	
Narromine	2	2	
Nyngan MPS	1	1	
Walgett MPS	4	4	Operating at 6 shifts a week
Warren MPS	2	2	
Wellington	4	4	
Total	32	26	

*As at September 2014

4.3 Outreach Service Provision

Outreach renal services are an important component of the Western NSW LHD Renal Service, supporting and maintaining people on home therapies. The Renal Outreach Service provision includes the provision of clinical support to the Bathurst and Forbes HD Units and the facility-based units, supporting and monitoring people on home based dialysis and providing home HD and PD training. The Renal Outreach Service is provided by the multidisciplinary renal teams located at each of the Level 5 Renal Units. The renal specialists and dieticians provide outreach clinics at selected locations. The Renal Nursing Outreach Team undertakes six to ten weekly

(on-site) assessments of all people undertaking home and facility-based therapies within their catchment area. Currently there is a combined 3.5 FTE allocated to renal nursing outreach services from the Dubbo and Orange Renal Services, an increase of two FTE since 2011.

The community-based renal outreach nurses' role includes:

- The coordination and delivery of pre-dialysis activities such as patient assessments, case management and providing education regarding treatment options
- The coordination of vascular access interventions and the appropriate referrals
- The coordination and provision of home dialysis training
- Home HD and PD case management
- Providing a regular home visiting service for all people dialysing at home within the LHD: to monitor treatment and provide ongoing support to people dialysing at home and their families – home visits and clinical reviews are attended for all people dialysing at home within the first week of commencing PD and then one every 3 months once treatment is in progress. Home assessments involve evaluating the home circumstances, dialysis technique and environment.
- Supporting generalist staff from the smaller communities who are managing people receiving home dialysis in their community
- A follow up service to existing renal dialysis clients who have recently been discharged from hospital, occurring by phone within two days of discharge

Medical Outreach Clinics

Coordinated medical outreach services are held throughout the LHD. People with CKD and those receiving RRT are reviewed at these clinics. Renal specialists provide a medical outreach service which includes the initial review of new referrals and the revision of existing patients every three months. People reviewed at these outreach clinics include people dialysing at home (HD and PD), people receiving hospital-based HD, those requiring pre-dialysis education and transplant recipients. A summary of the specialist medical outreach clinics facilitated by the Western NSW LHD Nephrologists is listed below:

- Southern Sector Renal Service – monthly clinics at Forbes, Parkes and Condobolin
- Northern Sector Renal Service – bi-monthly clinics in Bourke, Brewarrina, Walgett and Warren

4.4 Allied Health Services

The NSW Renal Services Planning Group recommends that an in-centre unit staff profile should include dedicated allied health services such as social work and dietetics and also access to occupational therapy, podiatry, physiotherapy, psychology and Aboriginal health workers. Satellite and facility based home services should also have access to these services. There are currently two dietitians working within the Western NSW LHD renal services who were recruited in 2008. One FTE is located at Dubbo and the other at Orange.

Southern Sector Renal Dietician Outreach Clinics

To provide equitable services across the LHD, clinics are booked depending upon appointment numbers or people with renal disease in the catchment area. The Renal Dietician is available to be contacted during business hours via email for referrals and conducts in-centre consultations as required. The dietician is also present during the monthly blood review to monitor patients and accept referrals. Table 11 provides a summary of the clinic locations and frequency.

Table 11: Southern Sector Renal Dietician Outreach Clinics

Clinic Location	Frequency
Orange	Weekly
Bathurst	Fortnightly
Forbes	6-8 weeks
Parkes	3-4 monthly
Cowra	3-4 monthly
Condobolin	6 monthly

Northern Sector Renal Dietician Outreach Clinics

Table 12 provides a summary of the Northern Sector Renal Dieticians outreach clinic locations and frequencies.

Table 12: Northern Sector Renal Dietician Outreach Clinics

Clinic Location	Frequency
Dubbo	Weekly
Wellington	2-3 monthly
Dunedoo	2-3 monthly
Warren	2-3 monthly
Coonamble	3-4 monthly
Coonabarabran	3-4 monthly
Brewarrina	6 monthly
Mudgee	6 monthly
Cobar	No Current Service
Lightning Ridge	No Current Service
Bourke	No Current Service

4.5 Away from Home Haemodialysis

The Away from Home Haemodialysis (AFHH) Program is a new service offered to increase flexibility for people receiving HD living in NSW. Under the new statewide program run by EnableNSW (NSW Government Health Support Services), people now have better access to HD services when travelling away from home for purposes such as education, work and holidays. To be eligible for the service, people must register with EnableNSW and meet the selection criteria. AFHH is of no cost, subject to availability and program funding. The Dubbo, Orange and Bathurst units provide planned holiday dialysis or AFHH.

4.6 Services Provided in Partnership**4.6.1 Health Promotion and Illness Prevention**

There are well established health promotion programs in the Western NSW LHD targeting the precipitating causes of renal disease and modifiable lifestyles risk factors. Opportunities exist in the area of renal health promotion specifically and for formalised links with related health promotion activities targeting conditions such as diabetes and cardiovascular disease. There are also opportunities for a collaborative approach to early detection and intervention programs.

The multidisciplinary renal teams commence the implementation of health promotion and illness prevention strategies during pre-dialysis education and will continue throughout the care of each person who is dialysis dependent. Strategies that aim to promote and maintain good health include: informing the individual and family members of all the treatment options available and helping them choose the one best for their situation; providing access to the relevant resources; infection and/or inflammation prevention; fluid restriction; emergency management of treatment complications; management of comorbidities such as diabetes and hypertension; and the ongoing evaluation of health status and dialysis treatment techniques performed at home.

4.6.2 Renal Transplantation – Pre and post phases of care

Kidney transplantation is the preferred and most effective treatment option for ESKD, but only a small percentage of people with ESKD are eligible. Compared with dialysis, transplantation is associated with improved life expectancy, superior quality of life and reduced health care costs. Kidneys for transplantation come from either deceased or living donors. Those people unable to find a healthy, willing and compatible living donor are allocated to a waiting list for cadaver kidneys. The average waiting time for a transplant in NSW is three and a half (3.5) years.¹³

There are clear-cut inclusion and eligibility criteria for kidney transplantation in Australia to allocate the few available donated kidneys. A number of factors can prevent people from being considered including age, other health conditions, lifestyle factors such as obesity, smoking, drug and alcohol abuse and an inability to comply with complex medical therapy.¹⁴

Although transplantation occurs in major metropolitan hospitals, the Western NSW LHD Renal Service assists in pre and post phases of care. For example, the Orange Renal Service monitors the waiting list to ensure individuals maintain an active status by facilitating the monthly collection of serum for Red Cross. Post-transplant they will monitor blood pathology, immunosuppressant drug levels, adjust medications and liaise with the transplant team in Westmead.

Transplant Clinics

There are in excess of 30 transplant recipients within the Northern Sector Renal Service catchment area. These people are reviewed pre and post-transplant by the Dubbo nephrologists at the scheduled renal clinics. Transplants, both living and cadaver donations, are mostly coordinated by the RPA transplant team. The RPA team also provide a visiting outreach service every three months in Dubbo to perform transplant work ups and post-transplant reviews.

There are 50 transplant recipients within the Southern Sector Renal Service catchment area. These people are managed by a shared care arrangement between the renal specialists in Orange and Bathurst and a visiting renal specialist from Westmead Hospital. The visiting specialist provides an outreach service in Orange and Bathurst on a monthly basis for pre-transplant assessment and post-transplant follow up.

4.6.3 End of Life Care¹⁵

Some people with ESRD decide not to undergo dialysis and others may choose to withdraw from treatment. The death rate for people dependent on dialysis in Australia in 2012 was 12.7 per 100 patient years and 1.8 per 100 patient years for those with a functioning kidney transplant. The most common reason for death is attributed to withdrawal from dialysis for 'social' reasons, predominately psychosocial stress¹⁶. For these people, and those who are coming to the end of their lives due to ageing or complications, end of life care is an important part of their treatment plan. People are reassured that they still retain the right to re-discuss their options with the specialist renal team and receive full supportive care from the resources of the renal services, even if they choose not to dialyse. People who choose to not undergo or to withdraw from dialysis treatment, with their consent, are referred to the Western NSW LHD Palliative Care Services for assessment and specialist end of life treatment as required.

4.6.4 Renal Transport

Transport services are often important in ensuring compliance to RRT. The ongoing nature of dialysis treatment and the need for return transport three times per week compounds transport disadvantage for people who need to travel to receive hospital-based dialysis. Even those

¹³ Kidney Health Australia, *Fast Facts on CKD in Australia*, March 2013

¹⁴ Australian Institute of Health and Welfare, *Dialysis and kidney transplantation in Australia 1991–2010*, 2012

¹⁵ Government of Western Australia WACHS (Western Australian Country Health Service) Renal Dialysis –Plan 2010 to 2021, October 2010

¹⁶ Australian and New Zealand Dialysis and Transplant Registry (ANZDATA) *Thirty-Sixth Annual Report* (2013)

people using private transport who are required to travel to another town have a need for 'respite' options. Transport options currently available include:

- Independent travel – self funded driving private car, public transport, and taxi. Many patients are eligible for taxi vouchers under the Taxi Transport Subsidy Scheme.
- Dependent travel – people may be eligible to access any of the following transport providers: Ambulance (non-urgent), Veterans Affairs, LHD Patient Transport Unit, Isolated Patients Travel and Accommodation Assistance Scheme (IPTAAS), Aboriginal Medical Services and Home and Community Care (HACC) funded Community Transport services and the Non-Emergency Patient Transport (NEPT) Program to be implemented in the Western NSW LHD in 2015 with the establishment of a regional satellite booking hub in Dubbo

The use of non-urgent Ambulance travel is usually restricted to people who are severely frail and immobile and those over 65 years of age and have a written medical approval. IPTAAS provides financial assistance and accommodation expenses for permanent NSW residents who need to travel more than 100kms each way for dialysis treatment.

4.6.5 Medical Imaging and Pathology

The specialist Renal Teams work in close partnership with the LHDs medical imaging and pathology services to coordinate pre-dialysis management and dialysis treatment interventions that determine the status of kidney function and dialysis adequacy.

Radiology is required throughout treatment to check both HD venous and PD catheter placement and positioning. The insertion of vascaths is also performed in the radiology department. Ultrasound is frequently used for the assessment of vessel viability prior to fistula (AVF) formation and also to check for changes in established AVFs.

Specific blood tests are commonly used to diagnose CKD and monitor kidney function prior to the commencement of RRT, to measure dialysis adequacy during treatment and to maintain active status on the transplant list. Throughout their treatment people receiving HD undergo regular blood testing including haematology, chemistry, serology, microbiology and endocrinology. Blood is tested at least once a month to measure HD adequacy and adjustments may be made to the dialysis prescription dependent on blood results. Blood samples are collected during a usual dialysis session.

People receiving PD require peritoneal fluid chemistry testing to diagnose peritonitis and to assist clinicians in determining the most appropriate dialysis prescription. Peritoneal fluid testing is attended by the Dubbo and Orange health services pathology laboratories. People will attend the available pathology collection services monthly to have their blood taken for testing. People receiving PD are also required to undergo a PET two months after commencing PD and then yearly or after an episode of peritonitis or where there is a clinical concern. Dialysis adequacy testing and PETs are attended at Dubbo and Orange hospitals due to the need to standardise the results to a single laboratory. PETs are a day stay admission as the person is required to stay for six hours.

A kidney transplant recipient evaluation involves various medical tests to assess the recipient's general health status. Tests include chest x-rays, ultrasound and other medical imaging to investigate heart health and blood testing for tissue typing. To remain active on the transplant waiting list potential recipients must have monthly blood tests. This blood is taken locally and sent to the Australian Red Cross Blood Services' tissue typing laboratory in Sydney for monitoring and registering of transplant lists.

4.6.6 Paediatric Renal Services

Specialist paediatric renal services are provided at the two Sydney specialist children's hospitals. Currently there are not any children requiring renal replacement therapy in the

Western NSW LHD. In the past the Western NSW LHD Renal Services have provided hospital-based HD to children and supported children receiving dialysis in the community.

4.7 Coordination of Renal Services

The renal services based at the Dubbo, Orange and Bathurst units are managed by the relevant nurse manager and NUM. The Forbes and facility-based HD units are clinically supported by the Level 5 multidisciplinary teams but managed locally by the facility's health service manager (HSM). The renal staff specialists report to their relevant directors of medical services (DMS). The Dubbo based renal dietician is managed by the Unit nurse manager and the Orange based Dietician is managed by the manager of dietetic services and has a professional reporting relationship to the Orange units NUM.

Each of the Level 5 multidisciplinary renal teams meets regularly. The Orange renal team meets bimonthly and the Dubbo renal team meets every week for a multi-disciplinary meeting.

4.7.1 Renal Clinical Stream Committee

The key Western NSW LHD forum for the planning, delivery and development of renal services is the Renal Clinical Stream Committee. Membership includes renal physicians, renal CNCs, unit managers, senior LHD management, a senior health service planner, allied health and Aboriginal Health representation. The Stream became functional in 2008 meeting third monthly, but has recently reviewed its terms of reference and now meet bi-monthly.

4.8 Funding Mechanisms

From July 2012, the LHDs renal services and health facility budgets have been a combination of Activity Based Funding (ABF) and what is termed block funding which is basically a historical funding allocation in accordance with the Resource Distribution Formula (RDF).

However, in recognition of the particular priority issues related to renal service demand, the former NSW Department of Health made available opportunities for enhancement funding which provided additional capital and recurrent funding for the establishment and sustainment of priority dialysis services. This annual opportunity to apply for enhancement funding no longer exists.

The provision of renal enhancement funding was intended to supplement the LHD funds when grants were available. However renal services are considered core services and the allocation of recurrent funding, including additional funding required for the growth in services is the responsibility of the LHD and needs to be managed within the LHDs total budget allocation from the NSW Ministry of Health.

The Level 3, 4 and 5 renal unit dialysis activity is captured as inpatient separations while the facility-based units dialysis activity and any outpatients type occasions of service attended by the renal services workforce (such as clinics, home visits, pre-dialysis consultations and home training) are captured as non-admitted patients activity. If all activity is captured accurately optimal ABF will be realised. Each renal service is currently reporting its non-admitted dialysis activity via a monthly WebNAP report, although it has been previously identified that data capture needs to be improved.

Funding for all new home therapies was devolved to the Northern Sector Renal Service in 2011, resulting in the LHD now funding all dialysis consumables for home HD and PD. At this stage, the Southern Sector Renal Services home HD patient consumables continue to be supplied by the SDC. The home HD machines (used for home HD patients and in the facility-based units) are sourced through the SDC.

The Western NSW LHD Renal Services operates under the LHD-wide Price per Treatment (PPT) contract with Fresenius Medical Care, which includes the provision of HD machines,

dialysis chairs, consumables and technical support. This contract is due for renewal in 2015. It is anticipated that the new contract will incorporate all facilities providing HD across the LHD, ensure access to the latest technology and provide more treatment options for the in-centre units such a hemodiafiltration (HDF). The new contract will include the provision of chairs and consumables to the facility-based units and a central reverse osmosis unit for the Dubbo unit; this will bring Dubbo in line with the water treatment systems at Orange, Bathurst and Forbes. It is expected that the future PPT contract will be flexible to accommodate any future renal service growth, which may include any increase in the number of facility-based and/or satellite units across the LHD.

4.9 Renal Services Utilisation and Activity

4.9.1 Renal Services by Modality

Table 13 shows the percentage of people in the Western NSW LHD receiving RRT by treatment modality in comparison with the NSW benchmarks as articulated in *NSW Renal Dialysis Service Plan to 2011*. The percentage of people receiving in-centre dialysis (in the Dubbo and Orange units) is above the NSW benchmark, and satellite dialysis (Bathurst and Forbes) is below benchmark. This is likely to be due to differences in the classification of dialysis dependent people. Some people receiving dialysis in the larger units at Orange and Dubbo meet the criteria for satellite or lower level dialysis but attend the in-centre unit because it is closer to their home and the service modality available to them.

The home PD and HD rates are also below the recommended benchmarks. Anecdotal information indicates that people are increasingly seeking the facility-based home HD (self and/or limited care) over home HD. As the population ages, home HD may decline further as a modality and facility-based (self and/or limited care) and satellite dialysis will increase due to issues related to social isolation and environmental constraints and the level of care required by older people with a range of co-morbidities.

Table 13: Western NSW LHD Renal Dialysis Modalities

Modality	LHD %	NSW Benchmark
Total - Hospital Based	67.2%	50%
In-centre	32.8%	20%
Satellite	19.9%	30%
Facility-Based (self and/or limited care) Home HD	14.6%	-
Total - Home Based	32.8%	50%
Home Haemodialysis	4.7%	20%
Home Peritoneal Dialysis	28.1%	30%
Total	100%	100%

Source: *NSW Renal Dialysis Service Plan to 2011*

* As at the end of April 2014

As previously mentioned the Western NSW LHD provides a unique RRT option in the form of the facility-based (self and/or limited care) dialysis service, 14.6% of the LHDs renal dialysis population receive this type of RRT. Because this treatment modality is unique to the Western NSW LHD, it is not recognised by the State benchmarks. For future benchmarking activities this treatment option would need to be recognised.

4.9.2 Renal Dialysis Inpatient Activity - Supply¹⁷

Table 14 shows all renal dialysis separations from Western NSW LHD inpatient facilities (supply) for the five year period 2008/09 to 2012/13: a total of 68,753 renal dialysis (HD) inpatient admissions; 67,622 or 98% of these admissions were residents of the LHD (locals treated locally); the Dubbo and Orange units accounting for the majority of activity: both 30%.

¹⁷ NSW Ministry of Health , FlowInfo V13

Three percent of people receiving HD within the Western NSW LHD were people from other LHDs and/or States/Territories. The Orange HD Unit provided the majority (36%) of treatment to people from outside of the District, followed by the Bathurst Unit (29%), Dubbo Unit (25%) and Forbes Unit (10%). Further analysis of these separations for the five-year period 2008/09 to 2012/13 reveals the majority of inflows were from the Young LGA (45%) followed by the Lithgow LGA (27%). This is consistent with the proximity of these LGAs to the LHD facilities.

Table 14 highlights the growth in inpatient HD activity over the five-year period. In 2012/13 all facility-based dialysis activity started being recorded as non-admitted patient activity. In 2012/13 there were a recorded 2,666 non-admitted dialysis episodes. Together with the 12,363 inpatients admissions, a total of 15,029 episodes of hospital based dialysis were performed within the LHD in 2012/13. This represents a 24% increase in activity since 2008/09 (or an increase of 2,943 treatments).

Table 14: Western NSW LHD Renal Dialysis Separations – Supply

Hospital and Activity Measure	2008/09	2009/10	2010/11	2011/12	2012/13
Bathurst	2,122	2,161	2,276	2,410	3,308
Brewarrina	698	485	610	383	
Condoblin		51	126	72	
Cobar	60	-	-	42	30
Coonabarabran	6	-	-	-	
Coonamble	142	178	300	214	
Dubbo	3,889	4,338	4,695	4,074	3,996
Forbes	662	1,196	1,376	1,807	1,724
Gulargambone	151	150	83	-	
Mudgee	139	168	248	89	
Narromine	153	172	176	89	
Nyngan			5	71	
Orange	3,936	4,087	4,661	4,829	3,305
Warren	285	268	135	68	
Wellington	563	539	425	270	
Walgett			68	189	
Total Supply (Locals + Inflows)	12,806	13,793	15,184	14,607	12,363
Residents treated locally	12,701	13,691	14,989	14,235	12,006
% of Supply	99.2%	99.3%	98.7%	97.4%	97.1%
Total Inflows	105	102	195	372	357
% of Supply	0.8%	0.7%	1.3%	2.5%	2.9%
Overnight Patients	11	5	13	6	1
Urgent Admissions	48	108	77	80	30
Non-Urgent Admissions	12,758	13,685	15,107	14,527	12,333

Source: NSW Ministry of Health - FlowInfo V13

The largest growth in inpatient activity occurred in the Forbes and Bathurst units. The significant increase in activity was accompanied by an expansion of dialysis chairs/ports at each unit during the reporting period.

- The Forbes unit has increased activity by 1,062 admissions or 160% from 662 in 2008/09 to 1,724 in 2012/13. Since becoming operational in 2006 the unit has undergone two capital redevelopments increasing capacity from the original 2 chairs to the current 6
- The Bathurst unit has increased activity by 1,186 separations or 56%, during the period of analysis the unit has received enhancement funding to increase shifts to 12 per week and has also undergone redevelopment to increase chairs from 4 to 6

Dubbo Level 5 HD Unit

Analysis of 2008/09 to 2012/13 activity data identifies that the majority of people dialysing at the Dubbo unit were residents of the Dubbo LGA (70% of activity), followed by the: Narromine LGA (9% of activity), Parkes LGA (4%), Walgett LGA (3%), Gilgandra LGA (2%), and Coonamble LGA (2%). Western NSW LHD residents account for 99% of activity, the other 1% of people were residents of the neighboring LHDs and/or those receiving holiday dialysis.

People aged 70 years and over accounted for 29% of the Dubbo Unit activity and people of Aboriginal decent accounted for 36%. Very few people required overnight stays (0.05% over the five year period). For further detail regarding the renal dialysis activity at Dubbo refer to the Appendices section 8.4 Table A.

Orange Level 5 HD Unit

Analysis of 2008/09 to 2012/13 activity data demonstrates that the majority of people dialysing at the Orange Unit were residents of the Orange LGA (59% of activity), followed by the Cabonne LGA (12% of activity), Cowra LGA (11% of activity), Parkes LGA (5% of activity), Forbes LGA (4% of activity) and Bathurst Regional LGA (2% of activity). Western NSW LHD residents account for 98% of activity with the remaining two percent being people from neighboring LHDs and people receiving holiday dialysis.

Analysis of the characteristics of the patient population shows a different demographic profile when compared with the Dubbo Unit's patient population. The Orange Unit has an older patient population. People aged 70 years and over account for 42% of the activity and people of Aboriginal decent accounted for 17% of activity. Only 0.04% of dialysis activity over the five-year period required overnight admission. For further detail regarding the renal dialysis separations at Orange refer to the Appendices section 8.4 Table B.

Bathurst Level 4 HD Unit

Analysis of 2008/09 to 2012/13 activity data identifies that the majority of people dialysing at the Bathurst Unit were residents of the Bathurst Regional LGA (81% of activity), followed by the Oberon LGA (5% of activity) and Blayney LGA (4% of activity). Western NSW LHD residents account for 97% of activity with the remaining 3% being people from neighbouring LHDs. People aged 70 years and over account for 33% of the activity and people of Aboriginal decent represent 18% of activity. Overnight stay patients account for only 0.06% of dialysis activity over the five-year period. For further detail regarding the renal dialysis separations at Bathurst refer to the Appendices section 8.4 Table C.

Forbes Level 3 Unit

The Forbes renal unit became operational in August 2006. Analysis of 2008/09 to 2012/13 activity data identifies that the majority of people dialysing at the Forbes Unit were residents of the Forbes LGA (61% of activity), followed by the Parkes LGA (13% of activity), Cowra LGA (10% of activity) and Weddin LGA (7% of activity). Western NSW LHD residents account for 98% of activity with the remaining two percent being people from neighbouring LHDs. People aged 70 years and over account for 27% of the Forbes Unit's activity and people of Aboriginal decent account for a significant 49% of activity. There was no overnight stay patients recorded during the five-year period. For further detail regarding renal dialysis separations at Forbes refer to the Appendices section 8.4 Table D.

Smaller Rural Sites – Facility-Based Units

Analysis of the renal dialysis activity for the 12 health services providing a facility-based (self and/or limited care) dialysis service indicates that 100% of these services are utilized by people from the local LGA which is reflective of this treatment modality where in the past each HD machine has been allocated to a particular person by the SDC.

4.9.3 Renal Dialysis Inpatient Activity - Demand¹⁸

Table 15 shows the total number of renal dialysis separations for all Western NSW LHD residents from all hospitals across Australia (demand). The data reflects again the significant growth in HD activity over the five-year period. Facility-based HD treatments are recorded as non-admitted activity in 2012/13 – a total of 2,666 episodes). Public hospital admitted dialysis activity accounts for 99.9% of total demand, and private hospital demand 0.1%. Outflows to other public hospitals outside of the LHD accounted for only 1.5% of public hospital demand with the majority of separations occurring at the RNSH – SDC (31% of outflows) followed by the RPAH (15%). The outflows to the SDC would be Western NSW LHD residents leaving the LHD to receive home HD training.

Table 15: Western NSW LHD Residents - Renal Dialysis Inpatient Demand

Activity Measure	2008/09	2009/10	2010/11	2011/12	2012/13
Public Hospital Demand (Locals + Outflows)	12,911	13,870	15,163	14,379	12,326
Total Outflows	210	179	174	144	320
% of Public Hospital Demand	1.6%	1.3%	1.1%	1.0%	2.3%
Aboriginal Patients	4,329	4,865	4,816	4,213	3,460
Patients 70 years and over	4,587	4,804	4,810	4,323	4,067
Private Hospital Demand	20	10	33	3	14
Total Demand – Public + Private	12,931	13,880	15,196	14,382	12,340

Source: NSW Ministry of Health - FlowInfo V13

People aged 70 years and over account for 33% of dialysis demand and people with Aboriginal background 31%.

4.9.4 Renal Medicine Activity - Supply¹⁹

Table 16 provides a summary of admitted inpatient activity within LHD facilities for the service related group (SRG) renal medicine (supply). For the period 2008/09 to 2012/13 there was a total of 3,418 renal medicine separations with the average length of stay (ALOS) being 4.1 days, 3,321 or 97% of these admissions were residents of the LHD (locals treated locally). Three percent of activity was for people from other LHDs and/or States/Territories.

Medical renal medicine admissions accounted for 95% of separations over the five-year period and 90% of beddays with an ALOS of 3.9 days. The top three reasons for a renal medicine admission were other kidney and urinary tract diagnoses (45% of activity), renal failure (27%) and hypertension (21%).

Surgical admissions represented the remaining 5% of renal medicine activity within the LHD, accounting for the remaining 10% of beddays. The ALOS for the five-year period for these surgical admissions was 7.6 days. The main reason for a surgical renal medicine admission over the five-year period was for operative insertion of a peritoneal catheter (75%). This activity occurred at Dubbo (60%) and Orange (40%) health services.

The majority of admissions for renal medicine within the LHD were classified as urgent, accounting for 67% of activity. People aged 70 years and over accounted for 43% of activity over the five-year period and children aged less than 15 years accounted for 9%. People of Aboriginal background accounted for 15% of renal medicine admissions. The majority of renal medicine admissions to Western NSW LHD inpatient facilities occurred in Dubbo (34% of activity) and Orange (21%) followed by Bathurst (8%). For more detail regarding renal medicine separations from LHD facilities refer to the Appendices section 8.4 Table E.

¹⁸ NSW Ministry of Health , FlowInfo V13

¹⁹ NSW Ministry of Health , FlowInfo V13

Table 16: Western NSW LHD Renal Medicine Separations - Supply

Activity Measure	2008/09	2009/10	2010/11	2011/12	2012/13
Total Supply (Locals + Inflows)	703	647	698	743	627
Beddays	3,139	2,938	2,663	2,794	2,437
ALOS	4.5	4.5	3.8	3.8	3.9
Medical	661	616	660	707	594
Beddays	2,901	2,593	2,484	2,427	2,194
ALOS	4.4	4.2	3.8	3.4	3.7
Surgical	42	31	38	36	33
Beddays	238	345	179	367	243
ALOS	5.7	11.1	4.7	10.1	7.4
Residents treated locally	684	625	677	722	613
% of Supply	97.3%	96.6%	97.0%	97.2%	97.8%
Total Inflows	19	22	21	21	14
% of Supply	2.7%	3.4%	3.0%	2.8%	2.2%
Patients aged less than 15 years	21	19	105	119	42
Patients aged 70 years and over	325	321	276	297	256
Aboriginal Patients	115	91	95	105	108
Urgent Admission	498	456	444	465	427
Non-Urgent Admission	205	191	254	278	200
Same Day Patients	173	152	228	254	159
Overnight Stay Patients	530	495	470	490	468

Source: NSW Ministry of Health - FlowInfo V13

4.9.5 Renal Medicine Activity - Demand²⁰

Table 17 also shows the total number of renal medicine separations for all Western NSW LHD residents from all hospitals across Australia (demand). Public hospital renal medicine admissions account for 89% of total demand, and private hospital demand 11%.

Table 17: Western NSW LHD Residents Renal Medicine Separations - Demand

Activity Measure	2008/09	2009/10	2010/11	2011/12	2012/13
Public Hospital Demand (Locals + Outflows)	759	741	786	831	694
Total *Outflows	75	116	109	109	81
% of Demand	9.9%	15.6%	13.9%	13.1%	11.7%
Private Hospital Demand	61	86	94	93	117
Total Demand – Public + Private	820	827	880	924	811

Source: NSW Ministry of Health - FlowInfo V13 *Outflows includes admissions to other public hospitals it doesn't include admissions to private facilities or private hospital demand.

Outflows to public hospitals outside of the LHD accounted for 13% of public hospital demand with the majority of separations occurring at Westmead (16% of outflow activity), RPAH (15%), and Children's Hospital – Westmead (10%). Children (aged 14 years, 11 months and under) from the LHD accessing the specialist renal paediatric services of the Sydney Children's Network accounted for 15% of outflows.

4.9.6 Renal Services – Non Admitted Patient Activity

Table 18 provides a summary of the available non-admitted patient activity (outpatient type occasions of service) for renal services. In 2012/13, the facility-based dialysis units commenced recording dialysis treatments as non-admitted activity instead of inpatient activity or admitted separations. Analysis of the available non-admitted data has highlighted inconsistencies in data collection and precipitated a review of the current data capturing processes. Data is not available

²⁰ NSW Ministry of Health , FlowInfo V13

for renal clinics regularly held in Forbes, Condobolin, Bourke, Walgett and Warren. The Renal Dietetics Services activity is also under reported. The review process has also identified that other outpatient type sessions, such as pre-dialysis consultations, are not being captured. The relevant renal services have initiated actions to improve data collection.

Table 18: Western NSW LHD Renal Services – Non-Admitted Patient Activity

Facility	Service Type	Provider Type	2011/12	2012/13	2013/14
Renal Clinics					
Bathurst	Renal Clinic	Medical/Surgical Specialist		165	369
Brewarrina			55	93	
Dubbo			3,096	2,976	2,966
Orange			1,085	1,689	1,806
Renal Dietetics Service					
Dubbo	Dietetic Service	Dietician/Nutritionist	90	71	54
Forbes			2	2	13
Orange				145	83
Nursing Services					
Dubbo	Home HD	Nurse			2,017
	Home PD	Nurse			9,232
	Renal Service	Nurse/Nephrology	412	1,097	788
Gilgandra	Nephrology	Nurse			30
Orange	Home PD	Nurse			3,526
	Renal Clinic	Nurse/Nephrology	197	181	254
Dialysis Activity					
Bourke	Haemodialysis	Nurse			41
Brewarrina			264	689	602
Coonamble			183	348	317
Gilgandra					100
Mudgee			99	52	
Narromine			65	154	139
Nyngan			40	81	
Walgett			151	446	789
Warren			110	302	251
Wellington			242	596	516

Source: WebNAP. Extracted 15/05/2014 Prepared by: Organisational Performance Management *Updated Feb 2015 to reflect the Western NSW LHD Non Admitted Patient Activity Report – June 2013/14

4.10 Current Service Capacity and Future Demand Predictions

The demand for renal services is projected to continue to grow within the Western NSW LHD. Analysis of the current renal service capacity indicates there is (or will be following redevelopment) additional treatment capacity at Dubbo, Orange, Bathurst and Forbes HD units. Growth in home-based dialysis will require a review of the existing Renal Outreach Teams' capacity and the future enhancement of these services as demand requires.

4.10.1 Northern Sector Renal Service

The Dubbo Unit has the capacity to treat 40 people (120 treatments per week) operating 12 shifts per week. The Unit is currently operating at 77.5% capacity. The Dubbo Health Service redevelopment will result in an expansion of the unit to 14 chairs: including 12 dialysis treatment bays, two isolation rooms and two home training rooms.

The facility-based HD units associated with the Dubbo unit are limited in capacity due to their existing physical infrastructure. The size of the rooms accommodating the dialysis service limits the number of machines that can be installed. As at the end of April 2014 Bourke, Brewarrina, Coonamble, Gilgandra, Mudgee, Narromine, Nyngan, Walgett, Warren and Wellington were operating at capacity. Staffing these units remains an ongoing challenge for the LHD.

The current location of the renal port/chair within the Nyngan MPS limits expansion of this service despite the predicted future demand in this area. It is anticipated the renal chair will need to be relocated and additional treatment spaces created. Other sites identified by the Renal Clinical Stream Committee requiring expansion in the future (due to current pre-dialysis activity and projected hospital-based dialysis demand) are Mudgee, Cobar and Coonabarabran.

The Western NSW LHD is committed to transitioning (over the next five years) to a model of renal care across the Northern Sector that maintains high quality renal services closer to where people live, prevents community dislocation and maximises staff resources. It is proposed to establish a number of Level 3 satellite units in the Northern Sector dispersed across the catchment area rather than any further development of the ad hoc facility-based dialysis services. The Renal Clinical Stream Committee have identified Nyngan, Brewarrina, Coonamble, Cobar, Mudgee and Walgett as the priority sites for redevelopment as satellite units in the future. The implementation of this strategy is dependent on the availability of significant capital funding over the next ten years.

4.10.2 Southern Sector Renal Service

The Orange Unit has the capacity to dialyse 56 patients (168 treatments per week) operating 12 shifts per week. The service is currently capped to provide treatment to a maximum of 30 patients. Additional capacity is available if required to meet future demand.

The Bathurst Unit currently has the capacity to dialyse 24 patients per week operating 12 shifts per week. The Unit has an additional two ports that are currently not operational but could be made operational if demand requires.

The Forbes Unit currently has the capacity to dialyse 12 patients per week operating with six shifts per week. If demand requires, shifts could be increased to 12 per week providing treatment capacity for 24 people. This would require a FTE enhancement. In 2016 the unit will be increased to eight chairs with the Forbes Health Service redevelopment, increasing the total treatment capacity to 32 patients per week if operating 12 shifts per week.

The Cowra catchment area currently exhibits a significant demand for renal dialysis services with seven people travelling to Orange and Forbes to receive dialysis three times a week. There is also a significant number of people in the community on the pre-dialysis database with stage 4 and 5 CKD. The establishment of a dialysis service at Cowra has been identified as a priority for demand management and renal service development.

The Renal Clinical Stream Committee has also identified Condobolin as a potential site for the establishment of a Level 3 satellite dialysis unit in the future, dependent on the availability of capital funding.

4.10.3 Supporting Home-Based Dialysis

Table 19 shows the current and a proposed Western NSW LHD Renal Outreach Service workforce profile. Growth in home-based dialysis will require an enhancement of the existing Renal Outreach Teams' capacity to meet current and forecast demand. A proposed enhancement of two FTE RNs is suggested to provide increased support to people dialysing at home. It is recommended one (1) additional Renal Outreach RN be based at Dubbo to increase the capacity of the Outreach Service to meet more desirable patient ratio's, and one (1) additional Renal Outreach RN based at Orange to operationalise the home HD training unit and to provide additional support to the existing Outreach Service.

Kidney Health Australia's *A Model of Home Dialysis - Australia 2012*²¹ suggests social workers, should be a regular part of the home-based dialysis care program. AHWs are also considered invaluable in areas where high ratios of Aboriginal patients occur. Informed by these

²¹ Kidney Health Australia, *A Model for Home Dialysis Australia – 2012*, January 2012

recommendations and the LHDs target to increase the rate of people dialysing at home, it is proposed that the Renal Outreach Service workforce profile include Renal AHWs and Renal Social Workers for each sector. Renal AHWs and Social Workers can be utilised to assist people overcome personal, social and cultural barriers that inhibit the uptake of home dialysis.

Table 19: Current and Proposed Renal Outreach/Training Service – Staff Profile

LHD	Current	Total FTE	Proposed	Total FTE
Northern Sector	1.5 FTE Renal Outreach Nurse – PD training and support	2.0	Additional 1.0 FTE Outreach RN with redeveloped unit	5.0
	0.5 FTE Home HD training		Additional 1.0 FTE Renal Social Worker	
			Additional 1.0 FTE Renal AHW	
Southern Sector	1 FTE PD Nurse – PD training and support	2.0	Additional 1.0 FTE Outreach RN	5.0
	1 FTE Outreach CNC		Additional 1.0 FTE Renal Social Worker	
			Additional 1.0 FTE Renal AHW	
Western NSW LHD Total		4.0	Proposed enhancement = 2 FTE RNs, 2 FTE Social Workers, 2 FTE AHW	10.0

Source: Western NSW LHD Renal Service – February 2015

4.10.4 Future Demand Predictions²²

The Health Services Research Group confirmed that the components that determine the growth in the prevalence of dialysis are:

- Population growth
- Time to approach an equilibrium state
- The change in the incidence of new cases
- The transplant failure rate and the changing mortality rates

The first three factors are considered to have the most significant impact on the rise in the number of ESKD patients over the next 15 years. Growth in dialysis numbers is a function of the different rates of incidence, death and transplantation. That is, prevalence is increasing faster than incidence because the arrival rate (new cases and failed transplants) is greater than the discharge rate (death and successful transplants).

Analysis of ANZDATA shows that the average growth rate of dialysis dependent people per annum in Australia over the past 10 years is 4.9% and in NSW 4.7%. An interim recommendation from the former NSW Department of Health is that prevalence in the Western NSW LHD will increase by 6% per annum. Using this method, and the 2014 prevalence as a baseline, projected demand to 2024 (shown in Table 20) increases to 229 (an additional 135 people requiring treatment), and 410 by 2029 (an additional 239 people requiring treatment).

Table 20: RRT projections for the Western NSW LHD – based on 6% annual increase

Western NSW LHD	2014	2019	2024	2029
Dialysis dependent population	171	229	306	410

Prepared by Western NSW LHD Planning and Service Development Unit

Between 2001 and 2007 renal dialysis services experienced a growth rate greater than 10% per annum. This is considered to be largely due to the higher proportion of Aboriginal people and the increased ageing of the population. If this local trend continues, the predictions outlined in Tables 20 will be an underestimate. Table 21 shows current and projected demand for dialysis

²² NSW Health Revised Projections of Demand for Renal Dialysis Services in NSW to 2021, May 2009

services in the Western NSW LHD based on a 6% per annum increase in prevalence as recommended by the former NSW Department of Health. As discussed above, this may be an underestimate should the current rate of growth of approximately 10% per annum continue.

Table 21: Projected demand for dialysis services within the Western NSW LHD

LHD Renal Services	July 2011				Projections		
	No. of people - facility haemodialysis	No. of people - home haemodialysis	No. of people - peritoneal dialysis	Total	2019 projections	2024 projections	2029 projections
Northern Sector Renal Service	52	3	36	91	122	163	218
Southern Sector Renal Service	63	5	12	80	107	143	192
TOTAL – Western NSW LHD	115	8	48	171	229	306	410

* Calculated at the NSW projected growth rate of 6% per annum and applying NSW benchmarks

A summary of the proposed additional HD treatments required to meet the projected demand for services in 2019 is found in Table 22. This does not take into consideration occasions when people require acute dialysis. Further, some Lithgow residents requiring HD may access the services at Bathurst. These points suggest that caution should be exercised in the interpretation of these projections.

Table 22: Current and projected demand for HD services within the Western NSW LHD

Health Service	Level 3, 4, 5 & Facility Based Units			Capacity in 2014 (Treatments Per Week)			Projected Demand 2019					
	Total people 2014	Ports/Chairs	Shifts per week	Existing capacity	Activity July 2014	Spare Capacity	Projected people 2019	Treatments required	Additional treatments required			
Dubbo	27	10	12	120	81	39	36	108	0			
Orange	29	14	12	168	87	81	39	117	0			
Bathurst	23	6	12	72	69	3	31	93	21			
Forbes	11	6	6	36	33	3	15	45	9			
Bourke	1	2	0	6	3	3	34	102	0			
Brewarrina	5	6	3	18	15	3						
Cobar	0	2	0	6	0	6						
Coonabarabran	0	2	0	6	0	6						
Coonamble	3	3	3	9	9	0						
Gilgandra	1	2	3	6	3	3						
Mudgee	1	2	3	6	3	3						
Narromine	1	2	3	6	3	3						
Nyngan	1	1	3	3	3	0						
Walgett	7	4	6	24	21	3						
Warren	1	2	3	6	3	3						
Wellington	3	4	3	12	9	3						
TOTAL	114	68	72	504	342	162				155	465	30

*As at end of April 2014 - Prepared by Western NSW LHD Planning and Service Development Unit

5. Current Service Issues / Challenges

Recent consultations with the Western NSW LHD Renal Stream Committee have identified the following issues as having the most significant impact on current and future service provision:

- The current and forecast demand for dialysis services and the LHDs renal services current and future capacity to meet projected demand
- The need for consistent practices across the LHD. The existing two renal services (Northern and Southern Sector) vary in both areas of clinical practice and funding mechanisms. There are also variations in workforce profiles for each of the Level 5 Units and different nurse to patient ratios are in place
- Home based therapies within the LHD are below State benchmark. Currently only 33% of the LHDs dialysis population have their treatment at home. This is well below the NSW target of 50%
- Limited Renal Outreach Services to support people dialysing at home, the 'gold standard' multidisciplinary renal outreach team would include: nephrologists, nursing staff, educators, dieticians, social workers and AHWs
- There are limited transport options for people travelling greater than one hour one way for dialysis treatment. This is compounded by the lower socioeconomic status of the population and associated difficulties in accessing transport
- Non-admitted patient activity is under captured and reporting and coding methods are inconsistent which impacts on activity analysis and future demand projections and has funding implications
- Needs analysis demonstrates there are currently areas where despite demand, infrastructure or capacity is not available to provide treatment 'close to home'. Priority areas for future service development are Cowra and Nyngan
- Anecdotal information indicates that the requirement for travel to Sydney for education is a disincentive for the uptake of home HD in the Southern Sector. Home HD training services are currently not available at the Orange Unit
- Treatment flexibility is limited within units, for example the allocation of a 'floating chair' would accommodate people who need to change treatment days and people accessing respite or holiday dialysis
- Funding mechanisms and the ongoing management of people dialysing at home varies across the LHD

6. Future Direction and Key Action Areas

In setting the course for future service development, the Western NSW LHD has set five strategic priorities. These priorities as presented in the *Western NSW LHD Strategic Health Services Plan* are underpinned by the findings of the *Western NSW Health Needs Assessment*, review of Commonwealth and State policy directions, and expert and community opinion from a range of key stakeholders across the LHD. The five strategic priority areas are, to:

1. Develop a coherent Western NSW system of care
2. Support high performing primary health care
3. Close the Aboriginal health gap
4. Improve the patient experience
5. Live within our means

The following enablers will support the attainment of the strategic priorities:

- Workforce capacity and capability
- Information services and technology
- Telehealth
- Transport and accommodation
- Partnerships and community development
- Working smarter

Using these five strategic priorities as a guiding framework, the Western NSW LHD Renal Services have identified the following ten key areas of focus to improve renal service access, delivery and quality:

1. The establishment of a coordinated and coherent system of care, with consistent operating policies, funding mechanisms and well defined pathways to support people through predialysis education, dialysis training and RRT
2. Retention and recruitment of a sustainable skilled workforce, including the training and support of generalists by specialist medical, nursing and allied health staff
3. Capturing and monitoring activity and performance, including improved non-admitted patient data collection
4. The promotion of home based dialysis and self-management as the first treatment option for people requiring RRT when clinically and socially appropriate
5. Working in collaboration with primary care providers, including general practitioners, Aboriginal Controlled Community Health Services and other government and non-government providers to prevent, detect and manage CKD in the community to minimise the progression and consequences of CKD
6. Increasing Aboriginal participation in RRT, through identifying barriers to accessing services and increasing the cultural capability of services
7. The provision of treatment where appropriate at or closer to people's homes
8. The development of patient centred, responsive and flexible renal services
9. The reduction of service costs to ensure cost effective care
10. The management of increasing demand through the identification of locally based need and investment in high priority renal services

The agreed focus areas provide the parameters for the Western NSW LHD renal model of care. That is, renal services work in partnership with primary care and other sectors of the health system to prevent and identify early those with or predisposed to renal disease, and provide treatment and care within a range of treatment modality options according to clinical need and

client preference. The model should promote client independence (self-care) and limit the impact of the disease on the client and their family. Client education and the provision of renal outreach services will foster client independence and increase the capacity to treat people at or close to their home. Multidisciplinary care and a focus on the needs of Aboriginal people with or at risk of CKD are hallmarks of the proposed model.

Addressing these focus areas requires a comprehensive whole-of-health-system, evidence-based, person centred approach, the efficient and effective use of available resources, equitable access to appropriate multi-disciplinary services, alignment with relevant policies, plans, frameworks and strategies and the development and strengthening of effective partnerships. This will require changing the way we do business so we are better placed to meet the projected increased demand for renal services.

The Western NSW LHDs Renal Stream Committee has identified the following guiding principles to inform a preferred service model:

- A structured home therapies first policy
- Person-centred care
- Maximise independence and minimise dependence
- Treatment at or closer to home
- Shared care working in collaboration with Aboriginal health workers, Aboriginal Controlled Health Care Services, general practitioners and primary and community health service providers
- Supportive organisational and clinical governance structures

The key strategies and actions identified for each focus area are aligned to the five strategic directions of the *Western LHD Strategic Health Services Plan* and summarised in the following section.

Priority 1: Develop a coherent system of care

LHD Goal – Integrate and streamline renal services to ensure smooth patient journeys through efficient and effective renal care pathways.

Strategy 1A: Establish a coordinated and coherent system of care

Key Actions

- Reinforce and strengthen the clinical leadership role of the Renal Stream Committee - establish a coordinated structure that:
 - Enables communication through to the Operations Committee via the General Manager representative
 - Has clearly defined and agreed lines of accountability and responsibilities
 - Is working towards standardising renal protocols and procedures
 - Has developed key performance indicators
- Develop and/or adopt an integrated renal care pathway initiated pre-dialysis that standardises: pre-dialysis education/resources and protocols for management; and streamlines referral, consultation and transfer pathways; and outlines the ideal patient journey. A pathway that will maximise the potential for the successful uptake of home dialysis and starts at the first point of contact with a nephrologist
- Develop a patient dependency assessment and referral criteria tool that determines the appropriate nursing staffing level based on the determined patient acuity levels, to ensure the patient profile and acuity matches nursing ratio/workload
- Develop a Dialysis Patient Transfer Guideline that recommends transfer of a patient based on their presenting level of dependency level and acuity

Strategy 1B: Retain and recruit a sustainable skilled workforce

Key Actions

- In conjunction with the LHD Director of Nursing and Midwifery conduct a review of the current nursing staff ratio's in dialysis units and standardise across the LHD, ensuring the patient profile or acuity matches nursing ratio/workload
- Encourage and consider alternative workforce structures (currently dialysis units are predominantly RN operated) to include EENs and AHWs
- Grow the Aboriginal workforce employed in renal services across the LHD
- Work collaboratively with the LHD Aboriginal Health Team and ACCHSs to encourage AHWs to obtain renal care skill set
- In conjunction with the Nursing and Midwifery Directorate build capacity in the LHD to provide leave relief (local skill sufficiency) for renal nurses this may include: the relieving pool nursing staff are supported to complete the specialised renal training program
- All the in-centre and satellite renal workforce and LHD Renal Educator are trained in PD
- Expand the allied health workforce in renal services, for example: a dedicated renal social worker to address the complexity of issues/barriers associated with the uptake of home-based dialysis; and renal AHWs to work towards increasing Aboriginal peoples participation in RRT

Strategy 1C: Capture renal service activity and performance

Key Actions

- The Renal Clinical Stream Committee are to establish and maintain a quarterly LHD-wide renal service planning, clinical capacity and priority identification process based on activity data and projections. The review will refine forecasts in renal service demand; monitoring growth; encompass workforce requirements; facility capacity; capital and major equipment requirements. This review will be built into the bimonthly Renal Clinical Stream Committee meetings as a standing item on the agenda
- Improve and integrate patient information systems, allowing access to LHD-wide renal patient medical records, discharge summaries, and test ordering and results - informed by the NSW Ministry of Health's eHealth Strategy, *A Blueprint for eHealth in NSW*
- Develop reporting systems to regularly monitor the performance of Dialysis Units against determined clinical/performance indicators
- Work in partnership with the LHDs Organisational Performance Unit to improve the capture of non-admitted patient activity

Priority 2: Support high performing primary health care

LHD Goal – Undertake joint planning and action in partnership with primary health care providers such as the Medicare Locals and Aboriginal Community Controlled Health Services

Strategy 2A: Promote home-based dialysis and self-management as the 'first' treatment option when clinically and socially appropriate

The Western NSW LHD Renal Services will promote home-based dialysis and self-management as the first treatment option when clinically and socially appropriate, referrals to hospital-based HD units occur only if home has been ruled out, or a transplant is imminent. This can be achieved through a 'whole' renal service philosophy with an overarching mission that supports home dialysis and self-management. It will require a long term approach and investment in long term multi-faceted strategies including a combination of: pre-dialysis education strategies,

patient advocacy, psychological and social support, practical assistance such as the availability of respite care, financial support and supportive renal policy.

Key Actions

- Prioritise and increase the uptake of home-based dialysis within the LHD. Where appropriate people are encouraged to commence home-based therapies as the initial treatment. A “home first” philosophy supported by a model of care that promotes self-care and independence. A target of 50% of the LHD dialysis population are receiving home therapies by 2018 – currently people dialysing at home represent 32.8% of the LHDs dialysis population while the NSW benchmark is 50%.
- Develop/adopt a home first pre-dialysis model of care that: empowers people to participate in their own care; self-manage their condition and treatment; commences with CKD diagnosis; includes an evidence-based assessment tool detailing the selection criteria for acceptance of home-based dialysis. This will ensure standardised selection for home-based modalities and home assessment occur for each individual
- Engage with local primary, community generalist staff and ACCHSs, as required on an individual patient basis, to support and maintain people with ESKD and those dialysing at home through purposeful links to specialist renal staff. Including facilitating access to: endorsed educational resources; renal care pathways; home-based management plans; case conferences/patient reviews via telehealth; mentoring program/health coaching
- Work in partnership with relevant key stakeholders to promote access to counselling services to assist in addressing the identified complexity of psychological and social barriers inhibiting the uptake of home-based dialysis
- Explore and pursue options to minimise costs associated with the setting up home based dialysis for people who choose home based RRT – for example: home modification and utilities costs. This may include:
 - Providing financial support, for the partial or complete reimbursement of out-of-pocket expenses to set/up for home-based dialysis
 - Timely access to the allocated funds to support home set up costs
- Conduct an extensive review of all the current hospital-based HD patients’ situation to identify their individual barriers to attempting home-based dialysis. Consider the findings and if the individual is deemed potentially suitable for home-based treatment – design multidisciplinary pathways aiming to transition consenting individuals to home dialysis. Interventions may include: financial supplement to assist with set-up, referral to social worker, referral for Occupational Therapist assessment, and/or collaboration with an AHW
- Investigate the main reasons for drop-out (failure) from home dialysis. This may involve a review of PD training programs, current peritonitis rates, access complications, carer and/or patient fatigue, technique failure
- Promote patient autonomy and self-management for all hospital-based patients, including the promotion of self-needling and machine set-up where possible
- Expand the allied health workforce in renal services, for example: dedicated renal social workers and renal AHWs. Kidney Health Australia’s *A Model of Home Dialysis - Australia 2012*²³ suggests social workers should be a regular part of the home-based care program. AHWs are also considered invaluable in areas where high ratios of Aboriginal patients occur
- A robust nursing outreach service that supports people dialysing at home. This includes a regular every three months home visit programme, assessment of patients regarding a

²³ Kidney Health Australia, *A Model for Home Dialysis Australia – 2012*, January 2012

need for retraining and a routine home environment assessment of all people commencing dialysis. This requires an enhancement of the existing Renal Outreach Nursing Service to meet current and projected demand, an additional two (2) FTE RNs across the Western NSW LHD – one (1) additional Renal Outreach RN based at Dubbo to increase the capacity of the Outreach Service to meet the below mentioned desirable patient ratio's, and one (1) additional Renal Outreach RN based at Orange to operationalise the home HD training unit and provide additional support to the existing Outreach Service

Kidney Health Australia's *A Model of Home Dialysis - Australia 2012* recognises that high ratios of indigenous people and remoteness are factors that increase the need for lower patient ratios. The Queensland (QLD) renal clinical network in 2010 determined the following ratio's as desirable:

- Outreach Nursing Support 1:10 for home HD and 1:15 for home PD
- Social Worker 1:70
- Dietician 1:100
- Psychologist 1:200

Strategy 2B: Work in collaboration with primary health care providers to prevent, detect and manage CKD in the community, aiming to minimise the progression and consequences of CKD

Key Actions

- Renal Services contribute to a planned strategy of integrated chronic disease primary prevention program focusing on nutrition and physical activity interventions, smoking prevention and cessation, and diabetes prevention and management
- Develop a shared care model and establish multidisciplinary case conferencing to assist GPs, community health and relevant support services manage known people with CKD in their communities
- Support local primary, community and generalist staff, and ACCHSs to support and maintain people with CKD at home through purposeful links to specialist renal staff/resources including: an endorsed education program and resources; renal care pathways; home-based management plans; case conferences/patient reviews via telehealth; mentoring program
- Participate in ongoing health promotion and risk minimisation – the promotion of healthy lifestyle strategies for people with CKD aiming to maintain wellbeing and treatment modality retention by preventing complications and reducing risk factors – for example: moderate exercise programs, maintaining healthy nutrition, smoking cessation, hand hygiene and aseptic technique to prevent infection, annual dental check-ups and podiatry reviews

Priority 3: Close the Aboriginal health gap

LHD Goal – Translate the NSW Aboriginal Health Plan and Western NSW LHD Aboriginal Health Plan into local action, in partnership with ACCHSs and Medicare Locals

Strategy 3A: Increase Aboriginal participation in RRT

Strengthening the connections with the Aboriginal workforce will enhance the ability to deliver responsive and culturally appropriate care for Aboriginal people

Key Actions

- Work in partnership with the Aboriginal Health Team and ACCHSs to develop strategies that:
 - Support Aboriginal people to make informed decisions about their care

- Improve the uptake and support for home based dialysis
 - Improve access to renal disease treatment; and
 - Increase access to the kidney transplant waiting list and ultimately transplantation where clinically appropriate for Aboriginal people with CKD. Strategies that minimise barriers, avoid dislocation from community, improve health literacy and support early diagnosis and referral
 - Minimise barriers, avoid dislocation from community, improve health literacy and support early diagnosis and referral
- Source and adopt evidenced-based culturally appropriate educational resources that cover pre-dialysis, treatment modalities and preparation for treatment including education on pre-emptive transplant therapy
 - In partnership with the Aboriginal Health Team, health service managers and dialysis units investigate the feasibility of expanding the role of the Aboriginal workforce to assist with pre-dialysis education, provide ongoing support to people dialysing at home and facilitate the transfer of pending patients to and from renal services
 - Work collaboratively with the Aboriginal Health Team to encourage AHWs to obtain renal care skill set
 - Increase the number of Aboriginal people working in the specialist renal service, for example: renal nurses and renal AHWs. The Renal Clinical Stream Committee suggest a AHW 1.0 FTE for each sector aiming to enhance the Outreach Renal Service and the uptake of home-based dialysis
 - Participation of the renal workforce in cultural awareness and 'Respecting the Difference' competence training

Priority 4: Improve the patient experience

LHD Goal – Ensure patients and their carers feel safe, respected and cared for, and involved in care planning and evaluation

Strategy 4A: Provide treatment at or closer to home

Key Actions

- Sustain reasonable travel distances for people travelling for renal treatments – the agreed NSW benchmark for reasonable travel is one hour or less one way for treatment
- Increase the use of Telehealth to minimise patient and specialist travel time for consultations and education
- A high priority is to implement a home HD training service at the Orange Health Service
- Priority sites for renal service enhancement and capital investment to progress to Level 3 (satellite) renal dialysis units are Cowra, Nyngan, Mudgee, Cobar and Coonabarabran.
- Future renal service development is to be focussed on transitioning to a satellite model of care in the Northern Sector rather than any further development of ad hoc facility-based dialysis services. The Western NSW Renal Clinical Stream Committee have suggested the redevelopment of a number of the existing facility-based site to Level 3 satellite HD units, the endorsed sites include: Nyngan, Brewarrina, Coonamble, Cobar, Mudgee and Walgett. This strategy has the potential to maximise staff resources, prevent community dislocation while maintaining a high quality hospital-based dialysis service closer to where people live.

Strategy 4B: Develop a patient centred, responsive and flexible service

Key Actions

- Ensure all renal patients are considered and included in making decisions and choices about their care and about renal service planning and development
- Create flexibility within the hospital-based HD units to provide holiday and respite dialysis for people dialysing at home
- Support the establishment of self-care dialysis services in community settings when dialysis at home may be unsuitable. May involve partnerships with external health care providers to provide assistance and/or physical space for example: ACCHSs/AMSSs, and/or Medical Practices
- Explore options to decrease transport and improve transport/accommodation support for patients and families accessing renal services a significant distance from their home community
- Improve 'End of Life' care drawing on the expertise of the LHDs: Palliative Care Team; Aboriginal Health Team; and Renal Services
- Continue to explore and pursue alternate models of care that facilitate people staying at home or closer to home for example: increased use of telehealth

Priority 5: Live within our means

LHD Goal – Reduce service costs through improved productivity, and investment in high priority services

Strategy 5A: Reduce service costs and provide cost effective care

Key Actions

- Tender PPT in 2015 to competitive provider with flexibility to expand treatments/chairs
- Improve the uptake of home-based dialysis where appropriate
- Support people to sustain home-based dialysis and reduce dialysis related emergency presentation, hospital admissions and avoidable beddays
- Workforce innovation – the development of new and innovative staffing models utilising renal trained EENs and renal AHWs
- Investigate the use of Telehealth within the multidisciplinary management of dialysis dependent people, aiming to reduce travel and accommodation costs
- Encourage Salary Benefits packaging for renal services workforce

Strategy 5B: Investment in high priority renal services – demand management

Future renal service development will focus on transitioning to a satellite model of care in the Northern Sector rather than the current ad hoc facility-based dialysis service model. Service enhancement will be informed by current and projected demand. The Western NSW LHD Renal Stream Committee has identified the following facility-based sites for transitioning to Level 3 (satellite) renal dialysis units: Nyngan, Brewarrina, Walgett, Cobar, Mudgee and Coonabarabran. Capital investment is required to expand treatment spaces and transition to a satellite service at Nyngan, Cobar, Mudgee and Coonabarabran.

Key Actions

- Priorities for renal service development over the next 5 to 10 years include:
 - Establishment of a dialysis unit at Cowra
 - Expand dialysis treatment capacity at the Nyngan MPS
 - Operationalise a home HD training service at the Orange Health Service

- Work in partnership with the Organisational Performance Unit to improve Non-Admitted Patient Activity data collection processes and data quality to reflect true occasions of a service
- Development of a LHD Renal Services Disaster Plan in liaison with the LHD Disaster Planning and Management Coordinator
- Determine future funding mechanisms for renal service development for example for capital projects
- Review existing revenue streams such as private dialysis patients

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8. Appendices

8.1 Definitions – Renal Dialysis Modalities

Definitions as documented in the *NSW Renal Dialysis Service Plan to 2011*.

Haemodialysis (HD) is a procedure used to maintain a patient with ESRF by using artificial renal (dialyser) to remove waste products from the blood. The procedure is usually carried out three times per week and takes between four to six hours. This type of treatment can occur in a range of settings and may be performed independently by the patient or depending on clinical need, by trainee dialysis staff.

Peritoneal Dialysis (PD) is a technique where the dialysing fluid is instilled into the peritoneal (abdominal) cavity at regular intervals, and the waste products from the body diffuse into it. It is a cost effective form of renal dialysis that has proven to be more convenient by choice for many members of the community with ESRF, in particular for those who are employed and cannot afford the large amount of time required for HD. The two main forms of PD are:

Continuous ambulatory peritoneal dialysis (CAPD) is usually performed four times per day. Each exchange takes about 30 minutes to perform. In between each exchange the person is free to undertake the regular activities of daily living.

Automated peritoneal dialysis (APD) requires a machine to regulate the movement of fluid into and out of the peritoneal cavity. The person is attached to the machine at night before going to sleep, and while they sleep the machine performs 6–8 exchanges. During the day, solution is left in the peritoneal cavity so that dialysis can still occur slowly.

The HD Unit definitions as documented in the *NSW Renal Dialysis Service Plan to 2011* have been adapted to suit the services available within the Western NSW LHD using the NSW Ministry of Health role delineation level and descriptions as a guide.²⁴

Level 5 “In-Centre” HD Units

Level 5 HD (In-Centre) units will always be located within the footprint of a Major Rural Referral Hospital. These units will be accessible and within the operational tasking of a hospital cardiac arrest team. The unit has a NUM/NM and is staffed by experienced/senior renal nurses, with access to a Renal CNC and/or CNS/CNE.

These units will provide HD for acute nephrological emergencies. These units need to be able to respond quickly to provide emergency dialysis in some circumstances.

These units will provide the maintenance HD for patients with CKD while they are suffering from a significant acute medical or surgical illness not always directly related to CKD. Dialysis can be performed at other inpatient locations within the hospital, for example: in ICU.

These units will have a high level of medical support available. These resources will be in close proximity to the unit and in particular will include Consultant Nephrologists/Specialist Renal Physicians and renal / medical registrars on site 24 hours. A Consultant Nephrologist will always be available on an on call basis for the unit.

Patients with vascular access problems especially temporary access will come to these units for treatment and intervention. Access surgery and renal biopsies are performed.

²⁴ NSW Health, Guide to the Role Delineation of Health Services – Third Edition 2002, Statewide Services Development Branch

Such units will usually have staff on call to provide emergency dialysis 24/7 on an 'as need' basis.

Such units often provide staff and equipment to dialyse critically unwell patients in special care facilities outside the main HD unit for example in Intensive or Coronary Care Units.

Formal links with a Level 6 tertiary referral hospital and renal transplantation centre.

This unit may have a teaching and research role.

Level 5 units play a significant role in the training and support of patients receiving dialysis at home.

Level 4 HD Unit

Level 4 HD units will always be located within the footprint of a District Group 1 Hospital. These units will be accessible and within the operational tasking of a hospital cardiac arrest team. The unit has a NUM and is staffed by experienced/senior renal nurses, with access to a Renal CNC and/or CNS/CNE.

These units will provide the maintenance HD for patients with CKD while they are suffering from a significant acute medical or surgical illness not always directly related to CKD. Dialysis can be performed at other inpatient locations within the hospital, for example: in ICU.

These units will have a Renal Physician available on site and be on call for the unit. Medical Officers are on site 24 hours.

Level 4 HD units would initiate haemodialysis for stable patients adhering to a Western NSW LHD Renal Stream endorsed Policy Directive.

Patients receiving their maintenance dialysis treatment in these units cover a very broad spectrum of clinical acuity. Patients may be:

- Totally self-care fully trained to perform dialysis without assistance however because of social circumstances (for example, lack of partner or appropriate accommodation) need a facility apart from their home in which to dialyse.
- Totally dependent patients unable to perform any dialysis related tasks.
- Patients receiving dialysis in such units may have significant physical disability or cognitive impairment.

Such units often provide staff and equipment to dialyse critically unwell patients in special care facilities outside the main HD unit for example in Intensive or Coronary Care Units.

These units have strong formal links with Level 5 and Level 6 units for the provision of: clinical support; vascular access services; higher acuity care; outreach and transplantation services.

Level 4 HD units have a role in supporting people receiving dialysis at home.

Level 3 HD (Satellite) Units

Level 3 (Satellite) HD Units in the Western NSW LHD are located in District Group 2 Hospitals. Patients receiving their maintenance dialysis treatment in these units cover a very broad spectrum of clinical acuity. Patients may be:

- Totally self-care fully trained to perform dialysis without assistance however because of social circumstances (for example, lack of partner or appropriate accommodation) need a facility apart from their home in which to dialyse.

- Totally dependent patients unable to perform any dialysis related tasks.
- These units do not have to be located within hospital footprints.
- Patients receiving dialysis in such units may have significant physical disability or cognitive impairment. However they will be medically stable i.e. usually they do not require clinical assessment (apart from usual dialysis practice needs) on an each attendance basis.

These units do not have Consultant Nephrologists or renal registrars in close proximity, the patients are under the care of Nephrologist/ Renal Physician from a higher acuity service.

Level 3 HD units will have some expert dialysis nurses (for example, Clinical Nurse Specialist) involved in day to day dialysis treatment.

These units may have a role in supporting people receiving dialysis at home.

These units do not provide acute or emergency dialysis. Nor do they initiate dialysis.

These units have strong formal links with Level 5 and Level 6 units for the provision of: clinical support; vascular access services; higher acuity care; outreach and transplantation services.

8.2 Patient Dependency Categorising System

Patient dependency categorising system – adapted from the Newcastle Nephrology Department Patient Dependency Tool

Dependency 1

Self-care – patient able to dialyse without assistance. The criteria for these patients include:

- a) There is no unstable medical condition for example unstable diabetes.
- b) Are independent in all dialysis procedures.
- c) Have the ability to problem solve any dialysis related problems.

Dependency 2

Self-care – able to dialyse without assistance. The criteria for these patients include:

- a) There is no unstable medical condition for example, unstable diabetes.
- b) Are self-sufficient in all dialysis procedures, using nursing staff as they would a home dialyser helper.
- c) Have the ability to problem solve any dialysis related problems.

Dependency 3

Requires minimal interventions during the dialysis procedure. The criteria for these patients include:

- a) Is medically stable.
- b) Has the ability to attend most of the dialysis process but requires assistance with one of the following procedures for example, cannulation, problem solving, discontinuing and commencing dialysis.

Dependency 4

Requires multiple interventions throughout the dialysis procedure. The criteria for these patients include:

- a) That the patient is medically stable but requires supervision.
- b) Can complete simple tasks but requires assistance with most of the dialysis procedure.

8.3 List of Acronyms

AAMI	Association for the Advancement of Medical Instrumentation
ABF	Activity Based Funding
ABS	Australian Bureau of Statistics
ACCHSs	Aboriginal Community Controlled Health Services
AFHH	Away From Home Haemodialysis
AHW	Aboriginal Health Worker
AIHW	Australia Institute of Welfare
ALOS	Average Length of Stay
AMS	Aboriginal Medical Service
ANZDATA	Australian and New Zealand Dialysis and Transplant Registry
APD	Automated Peritoneal Dialysis
ARIA	Accessibility/Remoteness Index of Australia
AVF	Arterio-venous Fistula
BMI	Body Mass Index
CARI	Caring for Australians with Renal Impairment
CKD	Chronic Kidney Disease
CNC	Clinical Nurse Consultant
CNE	Clinical Nurse Educator
CNS	Clinical Nurse Specialist
EN	Enrolled Nurse
EEN	Endorsed Enrolled Nurse
ESRD	End Stage Renal Disease
ESRF	End Stage Renal Failure
FTE	Full Time Equivalent
GFR	Glomerular Filtration Rate
GP	General Practitioner
HACC	Home and Community Care
HD	Haemodialysis
HDF	Haemodiafiltration
HNA	Health Needs Assessment
HSM	Health Service Manager
IPTAAS	Isolated Patient Transport and Accommodation Scheme
KCAT	Kidney Check Australia Taskforce
LGA	Local Government Area
LHD	Local Health District
ML	Medicare Local
MPS	Multipurpose Health Service
NEPT	Non-Emergency Patient Transport
NSW	New South Wales
NUM	Nurse Unit Manager
O.T.	Occupational Therapist
PD	Peritoneal Dialysis
PET	Peritoneal Equilibration Test
PPH	Potentially Preventable Hospitalisations
PPP	Public Private Partnership
QEH	Queen Elizabeth Hospital
PPT	Price Per Treatment
RDF	Resource Distribution Formula
RN	Registered Nurse
RNSH	Royal North Shore Hospital
RO	Reverse Osmosis
RPA	Royal Prince Alfred
RRT	Renal Replacement Therapy
SDC	Sydney Dialysis Centre

SEIFA	Socio-Economic Index of Areas
SHSP	Strategic Health Services Plan
SLA	Statistical Local Area
SRG	Service Related Groups
VMO	Visiting Medical Officer

8.4 Activity Data

Table A: Dubbo Health Service In-Centre Unit – Total Renal Dialysis Separations

LGA of Residence	2008/09	2009/10	2010/11	2011/12	2012/13
ACT					2
Albury					3
Bathurst Regional	8	3	7	17	20
Baulkham Hills	2	2	2		
Blacktown			1		
Bogan		28	61	23	179
Bourke		86	14	9	54
Brewarrina	16	41	32	14	37
Broken Hill	3	11	3	5	10
Carrathool					10
Cabonne		2			
Cobar			23	29	1
Coolamon	1	1	1		
Coonamble	153	118	38	64	18
Cootamundra					1
Dubbo	2,252	3,042	3,377	3,143	2,893
Fairfield				4	
Forbes	8	31	6	6	7
Gilgandra	273	23	152	48	
Gosford	1		1		
Greater Taree	1	1			
Great Lakes	6	1			
Lake Macquarie			3		
Lane Cove					1
Maitland	27		3		
Marrickville		1	3	9	
Mid-Western Regional	57	33	16	61	5
Narromine	416	468	407	185	343
Narrabri					1
Newcastle					1
Orange	4	1			3
Overseas				2	
Parkes	254	271	248	69	1
Parramatta		1		1	
Port Macquarie - Hastings	2	1		3	6
Queensland			3	12	3
Shellharbour				1	
Tumut			1	2	
Victoria	11	2		12	13
Wagga Wagga					1
Walgett	60	67	118	136	327
Warren	215	19	29	17	14
Warrumbungle	6	35	139	115	24
Wellington	65	34	4	76	15

Western Australia	1				
Willoughby			1		
Wyong	34				
Young	7	15	1	9	
Unincorp. Other Territories			1	1	1
Total Separations	3,899	4,338	4,695	4,074	3,996
<i>WNSWLHD Residents</i>	<i>3,787</i>	<i>4,302</i>	<i>4,671</i>	<i>4,012</i>	<i>3,943</i>
<i>Inflows</i>	<i>102</i>	<i>36</i>	<i>24</i>	<i>62</i>	<i>53</i>
Patients 70 years and over	955	1,345	1,436	1,155	1,267
Aboriginal Patients	1,314	1,755	1,485	1,190	1,769
Overnight Patients	4	1	4	0	1

Source: NSW Ministry of Health - FlowInfo V13

Table B: Orange Health Service In-Centre Unit – Total Renal Dialysis Separations

LGA	2008/09	2009/10	2010/11	2011/12	2012/13
Bathurst Regional	15	46	28	390	29
Blayney	150	34	11	108	155
Brewarrina	1				
Cabonne	716	531	432	397	320
Clarence Valley					6
Coonamble		2			
Cowra	438	671	602	508	127
Dubbo		2			
Forbes	302	283	281	29	1
Goulburn	1				
Great Lakes			2		
Hornsby					2
Lachlan <i>minus Lake Cargelligo</i>	73	40	17	17	14
Lithgow			1	8	
Lismore					2
Mid-Western Regional		9		11	
Narromine		1			
NSW Unknown		9			
Oberon	12	22	33	38	3
Orange	1,793	2,132	2,813	3,075	2,480
Overseas					2
Parkes	404	235	270	149	3
Queensland	1	1			
Rockdale				1	
Tumut				3	
Victoria				1	3
Wagga Wagga				1	
Walgett			17		13
Warringah					2
Weddin	30	17	75	2	
Young		52	79	91	141
Total Separations	3,936	4,087	4,661	4,829	3,305
<i>WNSWLHD Residents</i>	<i>3,934</i>	<i>4,025</i>	<i>4,579</i>	<i>4,724</i>	<i>3,145</i>
<i>Inflows</i>	<i>2</i>	<i>62</i>	<i>82</i>	<i>105</i>	<i>160</i>
Patients 70 years and over	2,225	1,876	1,775	1,499	1,406
Aboriginal Patients	763	527	763	923	548
Overnight Patients	5	1	2	0	0

Source: NSW Ministry of Health - FlowInfo V13

Table C: Bathurst Health Service Satellite Unit – Total Renal Dialysis Separations

LGA	2008/09	2009/10	2010/11	2011/12	2012/13
ACT			2		
Bathurst Regional	1,772	1,723	1,687	1,977	2,760
Blayney	156	157	201		0
Blacktown					5
Cowra	52				
Inverell					5
Lake Macquarie					2
Lithgow			36	147	114
Mid-Western Regional				148	152
Oberon	141	132	166	34	136
Orange			13		12
Parramatta					1
Queensland				6	
Tamworth Regional	1				
Victoria		3	2		
Walgett			17	98	120
Wollongong		1			
Total Separations	2,122	2,161	2,276	2,410	3,308
<i>WNSWLHD Residents</i>	<i>2,121</i>	<i>2,157</i>	<i>2,236</i>	<i>2,257</i>	<i>3,181</i>
<i>Inflows</i>	<i>1</i>	<i>4</i>	<i>40</i>	<i>153</i>	<i>127</i>
Patients 70 years and over	941	824	709	724	901
Aboriginal Patients	175	286	344	731	691
Overnight Patients	0	0	4	4	0

Source: NSW Ministry of Health - FlowInfo V13

Table D: Forbes Satellite Unit – Total Renal Dialysis Separations by LGA of Residence

LGA	2008/09	2009/10	2010/11	2011/12	2012/13
Cabonne		6	82	104	2
Cowra				239	412
Forbes	339	829	1,000	1,102	876
Great Lakes			3		
Lachlan <i>minus Lake Cargelligo</i>	36	147	42		80
Orange				3	1
Parkes	195	214	137	155	186
Queanbeyan				2	
Weddin	92		67	152	150
Young			45	50	17
Total Separations	662	1,196	1,376	1,807	1,724
<i>WNSWLHD Residents</i>	<i>662</i>	<i>1,196</i>	<i>1,328</i>	<i>1,755</i>	<i>1,707</i>
<i>Inflows</i>	<i>0</i>	<i>0</i>	<i>48</i>	<i>52</i>	<i>17</i>
Patients 70 years and over	195	324	328	585	441
Aboriginal Patients	346	829	750	670	716
Overnight Patients	0	0	0	0	0

Source: NSW Ministry of Health - FlowInfo V13

Table E: Total Separations for Renal Medicine in Western NSW LHD facilities

Hospital	2008/09	2009/10	2010/11	2011/12	2012/13
Baradine	5	6	3	5	1
Bathurst	56	37	47	45	71
Blayney	2	2	-	-	1
Bourke	12	10	7	9	4
Brewarrina	8	9	3	3	4
Canowindra	9	10	16	8	4
Cobar	6	6	7	14	10
Collarenebri	3	-	2	5	3
Condobolin	14	11	9	6	4
Coolah	1	7	3	-	-
Coonabarabran	15	15	16	6	11
Coonamble	4	10	5	6	6
Cowra	22	24	13	28	19
Dubbo	226	190	261	279	192
Dunedoo	10	7	5	9	5
Forbes	22	11	20	22	17
Gilgandra	3	22	13	10	7
Grenfell	6	3	-	-	-
Gulgong	11	10	1	-	-
Lightning Ridge	6	2	2	6	2
Molong	12	5	4	6	4
Mudgee	29	39	21	10	20
Narromine	3	8	14	17	6
Nyngan	17	11	19	15	7
Oberon	3	4	6	6	4
Orange	132	127	129	156	158
Parkes	14	12	16	16	14
Peak Hill	2	3	5	4	3
Rylstone	9	4	8	7	5
Tottenham	2	-	-	-	3
Trangie	1	2	2	3	-
Trundle	1	-	-	2	1
Tullamore	4	-	2	1	-
Walgett	21	6	5	7	10
Warren	8	6	12	8	5
Wellington	4	28	22	25	26
Total	703	647	698	743	627

Source: NSW Ministry of Health - FlowInfo V13