

# Renal Services

## Module overview

Please note: This module must be read in conjunction with the Fundamentals of the Framework (including the glossary and acronym list).

Renal services are a specialised area of medicine involving the diagnosis, management and treatment of complications for patients with kidney impairment and/or disease. The onset of kidney disease can be sudden (acute) or develop over months or years (chronic), and may or may not progress to kidney failure. The spectrum of chronic kidney disease (Table 1) is based on the measurement of glomerular filtration rates (GFR).

Table 1: Spectrum of chronic kidney disease

Stage	Description	GFR (mL/min/1.73 m <sup>2</sup> )
1	Kidney damage with normal or increased GFR	≥90
2	Kidney damage with mildly decreased GFR	60–89
3	Moderately decreased GFR	30–59
4	Severely decreased GFR	15–29
5	Kidney failure/dialysis	<15

GFR is usually reported in millilitres per minute (mL/min) corrected for body surface area.

End-stage kidney disease (ESKD) results when the kidney function is insufficient to excrete waste, concentrate urine, regulate electrolytes and produce hormones to the extent that death will occur unless a renal replacement therapy (RRT) is instituted. The continuum of care for patients with chronic kidney disease (CKD) encompasses managing early and potentially treatable disease through to the management of ESKD, including renal-related surgery and RRT in the form of dialysis or transplantation services.

Care and management throughout the continuum of illness—from prevention, screening, diagnosis and pre-dialysis care through to treatment, supportive care and palliative care—is complex and requires specialised care. This care is delivered in a range of settings by a number of health professionals and through varying treatment modalities, including surgery, dialysis and supportive care. Renal care requires close collaboration between primary care providers, renal teams and other specialist services. The range of settings for the delivery of renal services includes the patient's home, public or private hospitals, stand-alone facilities and/or community healthcare settings.

Existing comorbidity combined with age and other patient characteristics can be used as a guide to classify ESKD risk. The mix of patients categorised by ESKD risk is likely to have implications for facilities in terms of staffing and service delivery. The *Caring for Australasians with Renal Impairment* (CARI) guidelines<sup>1</sup> are recognised as best practice standards in the provision of renal services and should be followed by renal service providers, wherever possible.

Renal services within the scope of the Framework and their location within the Framework are outlined in Table 2. The Framework's focus is on treatment services for patients with diagnosed renal impairment and/or disease that is provided by public or private health facilities, and includes renal dialysis services, renal-related surgery services and superspecialty renal transplantation services.

Table 2: Context for descriptions of renal services within the Framework

Renal services	Framework document
Renal dialysis services	Renal Services
Renal-related surgery services	Renal Services/Surgical Services
Superspecialty (including renal transplantation and renal paediatric) services	Renal Services
Palliative care	Palliative Care Services

Where nephrology services (general and interventional) and/or palliative care services are provided as part of renal service provision, please read other relevant clinical service modules within the Framework.

The detection and management of early CKD by primary care providers and non-nephrology registered medical specialists are outside the scope of the Framework.

Children younger than 14 years are not treated in Levels 1 to 4 services. Children younger than 14 years with renal impairment/disease need to be treated by staff with particular skills and expertise.<sup>2</sup> That is, paediatric nephrology services (encompassing general or complex paediatric nephrology, paediatric dialysis and paediatric renal transplantation) can only be provided under the care of an appropriate superspecialty paediatric service. All paediatric nephrology services are currently based in Brisbane, but are also offered via various outreach services. All referrals to paediatric nephrology services in Brisbane are made after consultation with the local paediatrician.

Children have specific needs in health services—please refer to the relevant children's services modules.

## Service networks

In addition to the requirements outlined in the Fundamentals of the Framework, specific service network requirements include:

- the provision of Level 1 and 2 services to patients and their families via support from a Level 3 (or above) service. Consultative services may be provided by a Level 3 (or above) service, either on-site or off-site at a lower level service
- consideration by staff, at different service levels, of the complexity and risks associated with the delivery of renal medicine and the need for specialised support
- assessment of patient risk—according to ESKD risk categories—can also provide a guide as to the appropriate level of service required, although other factors (e.g. a carer to assist with self-care, or a clinical opinion) may obviate this.

Levels of patient complexity appropriate for each service may be described as follows:

Levels 1, 2, and 3 services	Low complexity
Level 4 service	Moderate complexity
Level 5 and 6 services	High complexity

## Service requirements

In addition to the requirements outlined in the Fundamentals of the Framework, specific service requirements include:

- active participation in the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA).

## Level 1 Renal Service

### Service description

A Level 1 service supports independent renal dialysis undertaken in an ambulatory setting. Self-care dialysis treatment (either peritoneal dialysis or haemodialysis) for ESKD (adult and/or paediatric) may be undertaken in the patient's home or in a designated dialysis area in the community, or within the grounds of a healthcare facility.

Health professionals (including medical and nursing staff) are not present during the procedure of maintenance dialysis in home-care or self-care settings. A family member or support person/carer may assist the patient in the dialysis treatment. The patient and support person/s will be trained to manage problems related to their dialysis with access to the training staff via telephone.

For remote patients, a hospital or general practitioner may not be readily accessible. It is important that arrangements have been made to deal with complications (including medical evacuation) should they arise. Day-to-day consultation may occur via telephone or in consultation with a local health worker. The features of a Level 1 renal service are summarised in Table 3.

*Table 3: Summary of features of a Level 1 renal service*

Haemodialysis	Peritoneal dialysis	Vascular access	Ambulatory care	Management of comorbidities in renal patients
Home-based/self-care Follow-up support may include home visits, telephone contact and technical support for machines and water treatment	Home-based/self-care			
No health professional present	No health professional present	Not available	Not available	Not available

### Service requirements

As per module overview, plus:

- renal patients and local health service professionals must be supported with technical assistance and education by a Level 3 or higher service (which may not be in their own locality), including a range of medical, nursing and allied health professionals
- documented processes with public or suitably licensed private health facility/s for patient referral and transfer to/from a higher level of service to ensure safe service provision
- referral to a Level 3 (or higher) service for all patients experiencing serious comorbidities impacting on dialysing capacity or with vascular access problems
- all patients receiving maintenance dialysis must be clinically reviewed regularly by a registered medical specialist with credentials in nephrology and by advanced home therapies staff from a higher level service
- continuity of patient care achieved through communication and collaboration between the health services in the local community (including the local hospital) and a Level 3 (or higher) renal service through documented processes
- interval care undertaken by medical officers or nephrology nurse practitioners under the supervision of a registered medical specialist with credentials in nephrology.

## Workforce requirements

A Level 1 service requires:

### Medical

- routine medical reviews provided by a higher level service

### Nursing

- renal care coordination via the treating service; however, the patient may interact with nurses in the local community (e.g. domiciliary services, practice nurses [however titled] or diabetes educators and/or Aboriginal and Torres Strait Islander health workers)

### Allied health

- access to a social worker who has established community resources and networks to assist and support patients and their families in their own homes
- access to a dietician who is resourced to manage renal patients—the dietician could be from a Level 3 or higher service, but, whether servicing patients receiving dialysis or patients with CKD, should have sufficient renal experience, as well as access to relevant serum biochemistry and the maintenance dialysis team

### Other

- access to technical expertise (e.g. technician skilled in dialysis machinery maintenance, calibration and repair).

## Support service requirements

A Level 1 service requires:

Service	On-site	Accessible
medication		1

## Level 2 Renal Service

### Service description

A Level 2 service supports dialysis treatment for low-complexity patients who can be dialysed without assistance from a registered medical practitioner, but require the assistance of a registered nurse to perform the dialysis procedure. A family member or carer may also assist the patient.

The service provides and supervises maintenance dialysis in minimal care settings, but does not include dialysis treatment for patients with acute renal failure, and will not have overnight unplanned admission facilities. No direct renal medical services are provided. A registered medical specialist with credentials in nephrology (nephrologist) should review patients on dialysis every 2 months or more frequently if indicated. This clinical review will include home therapies staff and other members of the multidisciplinary team as appropriate. The features of a Level 2 renal service are summarised in Table 4.

*Table 4: Summary of features of a Level 2 renal service*

Haemodialysis		Peritoneal dialysis	Vascular access	Ambulatory care	Management of comorbidities in renal patients
In-centre	Home-based/self-care	Home-based/self-care			
Day-to-day supervision of maintenance dialysis in minimal care settings	Follow-up support may include home visits and on-call telephone contact and technical support for machines and water treatment	Not available	Not available	Not available	Not available

### Service requirements

As per Level 1 service.

### Workforce requirements

A Level 2 service requires:

#### Medical

- as per Level 1 service

#### Nursing

- registered nurses with training and experience in dialysis care must be available to assist the dialysis patient
- some renal care is coordinated locally, but is likely to have support from the treating service

## Allied health

- access to a social worker with Level 3 (or higher) service experience and a home visiting role, as required, with a designated renal caseload, including pre-dialysis, CKD or ambulatory care patients, and with documented processes with community support services
- nutrition and dietetics as per Level 1
- a designated clinical pharmacist—may be a pharmacist in the community with links to a pharmacist at a district or higher level
- access to a medication liaison and dispensary service to ensure continuity of medication management

## Other

- as per Level 1 service.

## Support service requirements

A Level 2 service requires:

Service	On-site	Accessible
medication		2
pathology		2

## Level 3 Renal Service

### Service description

A Level 3 service provides care to patients on maintenance dialysis. The full spectrum of dialysis modalities, such as home renal replacement therapies, may not be offered by every service; however, Table 5 outlines the requirements for the services when provided. Dialysis is provided in a designated dialysis area for patients with ESKD who require the assistance of a registered nurse. The service does *not* include dialysis treatment for patients with acute renal failure; however, it may provide long-term care of post-transplant patients, where appropriate.

Table 5: Summary of features of a Level 3 renal service

Haemodialysis		Peritoneal dialysis		Vascular access	Ambulatory care	Management of comorbidities in renal patients
In-centre	Home-based/ self-care (If provided)	Admitted patient (if provided)	Home-based/self-care (If provided)			
Independent and dependent haemodialysis  Patient acuity influenced by level of medical cover available	Patients provided with follow-up support	Only if onsite nursing staff are trained to perform peritoneal dialysis, and if nephrologist supervision is available	Peritoneal dialysis training is provided only if specialist renal nurses are available (they may come on an <i>ad hoc</i> basis from another unit to train a patient in peritoneal dialysis or to review the patient closer to their home)	Only if reliable access is available to a registered medical specialist credentialed to perform renal-related surgery and radiology services	Very low complexity ambulatory care available in clinics for local patients on dialysis and some patients with CKD  Patients on dialysis may be reviewed by visiting a nephrologist	Meeting needs of low complexity patients (e.g. changing Permcaths™, or dealing with minor co-incident problems, such as broken leg, uncomplicated pneumonia)

### Service requirements

As per Level 2, plus:

- access to an emergency service in close proximity to a patient's home, or a retrieval plan for emergencies such as fistula problems or peritonitis in patients receiving peritoneal dialysis
- provision or links to a service that provides adult patient education/training in independent (home/self-care) dialysis
- vascular access surgery is only undertaken if the service has reliable access to a registered medical specialist credentialed to perform renal-related surgery (excluding transplantation) and radiology services
- peritoneal dialysis may be provided for admitted patients only if on-site nursing staff are trained to perform peritoneal dialysis and if supervision by a registered medical specialist with credentials in nephrology is available

- admitted patients with minor coincidental problems (e.g. a broken leg) may be managed provided they do not require care from a registered medical specialist with credentials in nephrology.

## Workforce requirements

A Level 3 service requires:

### Medical

- access—24 hours—to a registered medical specialist with credentials in nephrology

### Nursing

- direct care by registered nurses who have been trained to perform haemodialysis
- if peritoneal dialysis patients are treated within the service, the nursing staff must be trained to undertake these procedures
- renal care coordination is done locally, where appropriate

### Allied health

- access to a clinical social worker experienced in managing a renal patient caseload such as admitted patients, ambulatory care patients and dialysis patients—this caseload also includes home training, and the social worker should have access to specialised knowledge and established networks
- access to a dietician resourced to manage admitted renal patients, ambulatory care renal patients and dialysis patients. Their role also includes home training, and they should have established networks with the ability to access specialised renal dietetic knowledge
- access to a general clinical pharmacist or a pharmacist with dedicated renal responsibility to provide a service for inpatients. The pharmacist should have established networks with the ability to access specialist clinical knowledge of renal pharmacy for ambulatory renal patients and for peritoneal dialysis and haemodialysis
- provision of, or access to, a medication liaison and dispensary service to ensure continuum of medication management
- access to other relevant allied health professionals experienced to manage renal patients

### Other

- as per Level 1 service.

## Support service requirements

A Level 3 service requires:

Service	On-site	Accessible
medical imaging		2
medication	3	
pathology		2
surgical		3

## Level 4 Renal Service

### Service description

A Level 4 service provides Level 3 services plus definitive renal medicine care for patients with acute renal failure and ESKD (excluding perioperative, operative and post-operative management of kidney transplantation patients). The service offers renal investigation and treatment services for renal patients with complex multisystem failure.

A multidisciplinary team of medical, nursing and allied health staff manages patients undergoing all types of dialysis and renal access surgery. A registered medical specialist with credentials in nephrology is available 24 hours. There is access to a registered medical specialist with credentials to perform renal-related surgery for peritoneal dialysis and primary fistula creation. Vascular access surgery for more complex fistula creation and revisions is desirable. A nurse who coordinates the care of patients' vascular access is also available.

The service may be part of a service network with higher level services ensuring access to information about the latest evidence-based care and treatments. Table 6 summarises the features of a Level 4 renal service.

*Table 6: Summary of features of a Level 4 renal service*

Haemodialysis		Peritoneal dialysis		Vascular access	Ambulatory care	Management of comorbidities in renal patients
In-centre	Home-based/self-care (if provided)	Admitted patients (if provided)	Home-based/self-care (if provided)			
Haemodialysis for acute and chronic dialysis	Home haemodialysis and training unit  Patients trained to dialyse independently	Peritoneal dialysis of moderate complexity	Home peritoneal dialysis patients trained to dialyse independently	Tunnelled and non-tunnelled line insertion (Permcaths™ and vascaths)  Insertion of Tenckhoff catheters and haemodialysis access	Clinics to review dialysis, long-term transplant, and CKD patients  Complexity of ambulatory care review influenced by local availability of diagnostics and other specialists	Moderate complexity (e.g. minor surgery or monitoring after minor acute coronary syndrome) dependent on local resources including the skills of nursing staff

### Service requirements

As per Level 3, plus:

- must maintain links with a renal transplantation centre
- may manage a home therapies service (providing education, and professional and technical support) to allow independent or dependent in-centre haemodialysis or peritoneal dialysis locally or in other locations
- may manage and/or support lower level renal services and may provide long-term care of post-transplant patients, where appropriate.

## Workforce requirements

A Level 4 service requires:

### Medical

As per Level 3, plus:

- a registered medical practitioner on-site
- access to an interventional nephrologist or radiologist to perform dialysis access-related procedures
- access to a registered medical specialist with credentials to perform renal-related surgery (excluding transplantation)

### Nursing

- as per Level 3 service

### Allied health

- access to a clinical social worker or health practitioner with competencies in case management and counselling, and with specialised renal knowledge to manage a designated caseload, including admitted or ambulatory patient care, haemodialysis and home therapies
- access to established resources and networks to support patients and their families
- access to a dietician with designated renal responsibility and established networks with the ability to access specialised renal dietetic knowledge for management of inpatients, ambulatory care renal patients, and the haemodialysis and peritoneal dialysis units
- access to a clinical pharmacist with dedicated renal responsibility and established networks with the ability to access specialist renal clinical pharmacy knowledge for inpatients, ambulatory care renal patients, and the haemodialysis and peritoneal dialysis units

### Other

- technical expertise (e.g. technician skilled in dialysis machinery maintenance, calibration and repair available).

## Support service requirements

A Level 4 service requires:

Service	On-site	Accessible
anaesthetic	4	
cardiac (cardiac medicine)		4
intensive care	4	
medical	4	
medical imaging	3	
medication	4	
nuclear medicine		4
pathology		4
perioperative (relevant section/s)	4	
surgical	4	

## Level 5 Renal Service

### Service description

A Level 5 service provides definitive renal medicine care for patients with acute renal failure and/or ESKD (excluding perioperative, operative and post-operative management of kidney transplantation patients). The service offers renal investigation and treatment services for renal patients with complex multisystem failure.

The service is recognised as the highest level referral centre for patients with renal impairment/disease/failure who do not require transplantation. The service provides a full range of access surgery and management including:

- multistaged vascular access surgery
- central venous (cuffed and uncuffed) access catheter placement
- peritoneal dialysis catheter placement
- emergency access surgery and interventional radiology or nephrology services 24 hours
- access to allied health services and post-transplant management.

A multidisciplinary team of medical, nursing and allied health staff manages patients undergoing all types of dialysis and renal-related surgery. Treatment occurs in different hospital-based settings and extends to specialised units where patients require a higher level of care.

The service will be part of a service network with higher level services ensuring access to information related to the latest evidence-based care and treatments.

This service does not routinely treat children younger than 14 years. However, it may offer an educative/consultative service for paediatric renal patients. Table 7 summarises the features of a Level 5 renal service.

*Table 7: Summary of features of a Level 5 renal service*

Haemodialysis		Peritoneal dialysis		Vascular access (on-site)	Ambulatory care	Management of comorbidities in renal patients
In-centre	Home-based/self-care (if provided)	Admitted patients (if provided)	Home-based/self-care (if provided)			
Haemodialysis for acute and chronic dialysis	Home haemodialysis and training unit  Patients trained to dialyse independently	Peritoneal dialysis for all complexities	Home peritoneal dialysis patients trained to dialyse independently	Tunnelled and non-tunnelled line insertion (Permcaths™ and vascaths) Insertion of Tenckhoff catheters, haemodialysis access, and vascular access procedures	Clinics to review dialysis, long-term transplant, and CKD patients of all complexities	All complexities

## Service requirements

As per Level 4, plus:

- access to a Paediatric Intensive Care Unit
- usually manages a home therapies service (providing education, and professional and technical support) to allow independent or dependent in-centre haemodialysis or peritoneal dialysis locally or in other locations.

## Workforce requirements

A Level 5 service requires:

### Medical

As per Level 4, plus:

- a registered medical specialist with credentials in nephrology available 24 hours

### Nursing

- as per Level 3 service

### Allied health

- access to specialised clinical social workers—or health practitioners with competence in case management and counselling—with designated caseloads who provide services to admitted patients, ambulatory care patients, haemodialysis and home therapies units, as well as preliminary renal patient preparation for transplant work-up
- access to a dietician or a team of dieticians—one of whom should be a senior—with a designated renal caseload providing services to admitted renal patients, ambulatory care renal patients, and the haemodialysis and peritoneal dialysis units
- access to designated clinical renal pharmacists providing a clinical service to renal admitted patients, renal ambulatory care patients, and the haemodialysis and peritoneal dialysis units

### Other

- as per Level 4 service.

## Support service requirements

A Level 5 service requires:

Service	On-site	Accessible
anaesthetic	5	
cardiac (cardiac medicine)		4
intensive care	5	
medical	5	
medical imaging	4	
medication	5	
nuclear medicine	4	
pathology	5	
perioperative (relevant section/s)	5	
surgical	5	

## Level 6 Renal Service

### Service description

A Level 6 service provides renal transplantation services. Renal transplantation services include: organ donation procurement programs; live donor and deceased donor transplantation services; perioperative, operative and post-operative management; and long-term follow-up care.

A paediatric Level 6 renal service provides all renal services for children younger than 14 years, including general paediatric nephrology, paediatric dialysis, paediatric renal transplantation services, and a paediatric emergency retrieval and transfer service. Paediatric renal transplantation services encompass live donor and deceased donor transplantation services, perioperative, operative and post-operative management, and long-term follow-up care. A Level 6 service provides education and training programs in independent (home/self-care) dialysis for paediatric patients. There may be links with Level 5 or 6 adult renal services.

This level of service will be provided at a large metropolitan hospital. This service is the highest level referral centre for patients with acute renal failure/CKD/ESKD and is designated as a statewide and/or superspecialty service. In addition to providing services statewide, this level of service also accepts referrals from interstate and overseas, where applicable. There is active liaison with lower level intensive care services for the referral and transfer of patients.

The service provides a full range of access surgery including:

- multistaged vascular access surgery
- central venous (cuffed and uncuffed) access catheter placement
- peritoneal dialysis catheter placement
- emergency access to surgery, interventional radiology or nephrology services, and access—24 hours—to allied health services and transplant management.

A multidisciplinary team of medical, nursing and allied health staff manages patients undergoing all types of dialysis and renal surgery, including transplantation. Treatment occurs in different hospital-based settings and extends to specialised units where patients require higher level care.

A Level 6 service is part of a service network with lower level services ensuring the exchange of information about the latest evidence-based care and treatments. Table 8 summarises the features of a Level 6 renal service.

Table 8: Summary of features of a Level 6 renal service

Haemodialysis		Peritoneal dialysis		Vascular access (on-site)	Ambulatory care	Management of comorbidities in renal patients
Non home-based care	Home-based/self-care	Admitted patients	Home-based/self-care			
Pre- and post-transplant dialysis and intra-operative dialysis  Apheresis	Home haemodialysis and training unit	Peritoneal dialysis all complexities	Home peritoneal dialysis patients trained to dialyse independently	Tunnelled and non-tunnelled line insertion (Permcaths™ and vascaths)  Dedicated access surgery list	Ambulatory care review by nephrologist for all complexities  Full range of diagnostic, intervention and other superspecialty services	All complexities

## Service requirements

As per Level 5, plus:

- manages a home therapies service (providing education, and professional and technical support) to allow independent or dependent in-centre haemodialysis or peritoneal dialysis locally or in other locations.

## Workforce requirements

As per Level 5, plus:

### Medical

- access to a registered medical specialist with credentials to perform renal-related surgery (including transplantation)
- procedures performed by a registered medical specialist with credentials in paediatric renal surgery
- access—24 hours—to a registered medical specialist with credentials in paediatric renal medicine
- a registered medical specialist with credentials in paediatric surgery available 24 hours
- a registered medical specialist with credentials in paediatric anaesthesia available 24 hours

### Nursing

- renal care coordination for local and statewide services

### Allied health

- requires specialised clinical social workers—one of whom is senior—with a renal caseload providing specialised services to admitted renal patients, ambulatory care renal patients, haemodialysis and home therapy units, and pre/post-operative renal transplant patients
- access to the appropriate allied health specialists dedicated to paediatric renal services

- requires a dietician or a team of dieticians—one of whom should be a senior—with a designated renal caseload providing services to admitted renal patients, ambulatory care renal patients and to the haemodialysis and peritoneal dialysis units
- access to designated clinical renal pharmacists providing a clinical service to admitted renal patients, ambulatory care renal patients and to the haemodialysis and peritoneal dialysis units

### Other

- as per Level 4 service.

## Support service requirements

A Level 6 service requires:

Service	On-site	Accessible
anaesthetic	6	
children's anaesthetic	6	
medication	5	
medical imaging	5	
nuclear medicine	5	
pathology	6	
cardiac (cardiac medicine)	5	
intensive care	6	
medical	5	
perioperative (relevant section/s)	6	
surgical	6	

## Legislation, regulations and legislative standards

Refer to the Fundamentals of the Framework for details.

## Non-legislative standards, guidelines, benchmarks, policies and frameworks

In addition to what is outlined in the Fundamentals of the Framework, the following are relevant to renal services:

- American Dietetic Association. Medical nutrition therapy evidence-based guides for practice: Chronic kidney disease (non-dialysis) medical nutrition therapy protocol. Chicago: American Dietetic Association; 2002.
- Australia and New Zealand Renal Guidelines Taskforce. Evidence based practice guidelines for nutritional management of chronic kidney disease. *Nutrition and Dietetics* 2005; 63(supp 2):s35–s45.
- Australian Kidney Foundation, Australia New Zealand Society of Nephrology. The CARI Guidelines (Caring for Australians with Renal Impairment); 2003.  
[www.cari.org.au](http://www.cari.org.au)
- Australian Kidney Foundation, Australian Health Ministers' Advisory Council, National Aboriginal Community Controlled Health Organisation. National service guidelines for the management of dialysis and kidney transplantation in remote Australia. Conference: ATNS; 2006. [www.atns.net.au/agreement.asp?EntityID=4394](http://www.atns.net.au/agreement.asp?EntityID=4394)
- British Renal Society. The Renal Team: A multi-professional renal workforce plan for adults and children with renal disease. London: British Renal Society; 2002.  
[www.britishrenal.org](http://www.britishrenal.org)
- Burrows-Hudson S, Prowant B (eds). American Nephrology Nurses' Association: Nephrology nursing standards for practice and guidelines for care. New Jersey: Anthony J Jannetti Inc; 2002.
- Campbell S. Fluid Assessment: A competency assessment package for advanced nephrology nursing practice. *Renal Society of Australasia Journal* 2006; 2(3):41–50.  
[www.renalsociety.org/RSAJ/journal/nov06/campbell.pdf](http://www.renalsociety.org/RSAJ/journal/nov06/campbell.pdf)
- Department of Health (UK). The National Service Framework for Renal Services Part One: Dialysis and transplantation. London: Department of Health; 2004.
- Department of Health (UK). The National Service Framework for Renal Services: Working for children and young people. London: Department of Health; 2006.
- European Dialysis and Transplantation Nurses Association, European Renal Care Association. European guidelines for the nutritional care of adult renal patients. *EDTNA, ERCA Journal* 2003; 29(1):s1–s23.
- Kidney Health Australia. Chronic kidney disease management in general practice. KHA; nd. [www.kidney.org.au/](http://www.kidney.org.au/)
- National Kidney Foundation. Kidney Disease Outcome Quality Initiative. NKF KDOQI Advisory Board. NKF KDOQI Clinical practice guidelines for chronic kidney disease: evaluation, classification and stratification. *American Journal of Kidney Diseases* 2002; 39(supp 2):s1–s246.
- National Kidney Foundation. Kidney Disease Outcome Quality Initiative. NKF KDOQI Clinical practice guidelines for bone metabolism and disease in chronic kidney disease. *American Journal of Kidney Disease* 2003; 42(4):s7–s169.

- National Kidney Foundation. Kidney Disease Outcome Quality Initiative. NKF KDOQI Clinical practice guidelines for hemodialysis adequacy: update 2000. American Journal of Kidney Diseases 2001; 37(supp 1):s7–s64.
- National Kidney Foundation. Kidney Disease Outcome Quality Initiative. NKF KDOQI Clinical practice guidelines for managing dyslipidemias in chronic kidney disease. American Journal of Kidney Diseases 2003; 41(supp 3):s1–s79.
- National Kidney Foundation. Kidney Disease Outcome Quality Initiative. NKF KDOQI Clinical practice guidelines for nutrition in chronic renal failure. American Journal of Kidney Diseases 2000; 35(supp 2):s1–s140.
- National Kidney Foundation. Kidney Disease Outcome Quality Initiative. NKF KDOQI Clinical practice guidelines for peritoneal dialysis adequacy: update 2000. American Journal of Kidney Diseases 2001; 37(supp 1):s65–s136.
- Queensland Government. Selected Specialist Services Direction Statement 2001-2010. Queensland Health; 2001 (includes solid organ transplant services, renal transplantation and organ donation services).
- Queensland Government. Sub-specialty and Super Specialty Paediatric Services Report. Queensland Health; 2002 (for paediatric renal transplantation).
- Wiggins KL. Guidelines for nutritional care of renal patients 3rd ed. Chicago: American Dietetic Association; 2002.

## Reference list

1. Australian Kidney Foundation, Australia New Zealand Society of Nephrology. The CARI Guidelines (Caring for Australians with Renal Impairment); 2003.  
[www.cari.org.au](http://www.cari.org.au)
2. Department of Health, UK. National service framework for renal services: Part one - dialysis and transplantation. London: Department of Health; 2004.