2.1 ADULTS

Registered and non-registered nurses

Renal nursing involves a wide range of activities which support patients throughout their various care pathways, providing continuity during their journey with chronic kidney disease. A nurse is often the key link professional for a patient to the system of care provided by the multi-professional team. The role involves patient and carer education, support and advocacy. In addition, nurses require clinical skills and competencies to care for people with kidney disease at different stages of their illness from diagnosis to death. The clinical role of the nurse will vary depending on the level at which they trained, either as a registered or non-registered practitioner. Optimal staffing in hospitals is fundamental for safe and high-quality patient care and has been an area of increased focus in helping to improve quality of care and the working environment for staff.

Nursing workload and the ability to provide quality care is influenced by many variables including patient acuity and dependency. Other issues are also known to influence nursing workload more locally, including:

- The clinical model;
- The labour market;
- Staff capacity and capability, seniority and confidence;
- Organisational factors: i.e. support roles, support external to the ward, ward layout and senior sister/charge nurse supervisory time and leadership capability (Shelford Group, Safer Nursing Care Tool).¹

As a health service we are constantly revising and developing the roles of nurses in response to patient and service need. To address the workforce gap, new routes into nursing are being introduced. This includes use of the apprenticeship levy to train nursing associates and in some areas this funding may be used to further develop nursing graduates and advanced care practitioners. The apprenticeship levy is a UK tax on employers, which can only be used to fund apprenticeship training. Trusts will pay a percentage of the total pay bill into the levy ‘pot’ and then draw down this funding for apprenticeship training. To provide apprenticeship training and be able to access levy funding the Trust has to be a registered training provider. Registered trusts can be found on the Government Register of Approved Training Providers register (ROATP).²

It is important that these new frameworks provide good quality education and skills development so people can have lifelong nursing careers. Within the renal setting we struggle to recruit ready-trained renal nurses. In order to address this we need to think of career pathways to creatively develop our workforce utilising resources available, such as in-house education programmes and apprenticeship funding. A strategic vision of skills, competency-based practice, flexible careers and a holistic approach to patient care is required.

Nursing roles in kidney care

The complex nursing needs of people with kidney disease has led to the development of numerous specialist nursing roles which are well established and embedded in renal nursing and include: advanced kidney care, dialysis access, anaemia management, and transplantation. Titles can vary as can job descriptions and banding of posts depending on the skill set required. The needs and expectations of people with kidney disease and local demographics are constantly changing. Implementation of competency-based frameworks for education and development for registered and unregistered nurses can help meet such needs and expectations.

The levels of practice at which such nurses deliver care will vary depending on local workforce structures and, to a degree, funding. In relation to the career framework, a specialist practitioner will have a critical understanding of detailed theoretical and practical knowledge, have specialist and/or have management and leadership responsibilities. They must demonstrate initiative and be creative in finding solutions to problems. They may have some responsibility for team performance and service development and they consistently undertake self-development. This definition lends itself to roles in areas such as anaemia management, dialysis access, advanced kidney care, bone management and aspects of transplantation.
The advance practitioner role interfaces between different fields and is likely to have a wider remit than the specialist practitioner who may focus on a single aspect of kidney care. There is often confusion between advanced practice and specialist nurse roles, but the focus should be on level of practice not job titles. The skills required to practice at an advanced level are guided by the multi-professional framework for advanced clinical practice in England (Health Education England) and include four pillars: clinical practice; leadership and management; education, and research.3

The consultant practitioner requires highly specialised knowledge, some of which is at the forefront of knowledge in a field of work, which they use as the basis for original thinking and/or research. They are leaders with considerable responsibility, and the ability to research and analyse complex processes. They have responsibility for service improvement or development. They may have considerable clinical and/or management responsibilities, be accountable for service delivery or have a leading education or commissioning role.

Organ donation and transplantation

Organ donation and transplantation is a rapidly changing landscape, which continues to increase in complexity and diversity. The implementation of the 2008 ‘Organ Donation Taskforce’ (ODTF) recommendations and delivery of the UK 2020 Strategies for Organ Donation and Transplantation has led to a 98% increase in deceased organ donors.4 In the past 10 years, there has been a 67% increase in deceased donors, an overall increase of 33% in kidney transplantation and a 31% fall in the kidney transplant waiting list.5 The UK is a world leader in donation after circulatory death (DCD) and, in more recent years, there has also been an increase in donation after brain death.6 Although living donation has plateaued in recent years, it still accounts for 28% of kidney transplant activity and benefits more than 1,000 patients every year in the UK. The UK Living Kidney Sharing Scheme (UKLKSS) is the largest scheme in Europe and continues to expand. More than 1,000 patients have been transplanted through the scheme since 2007, significantly reducing the need for antibody incompatible transplantation. With the addition of non-directed altruistic kidney donors into the UKLKSS, the scheme has been effective in transplanting long-waiting patients with Black and Asian ethnicity, as well as immunologically complex recipients.7

As in all aspects of kidney care, nurses are embedded in every part of the organ donation to transplantation pathway and play a vital role in both donor care, living and deceased, and recipient care. Services are commissioned by different providers and roles and responsibilities may vary depending upon the clinical setting and model of care delivery. The diversity of job titles and roles, particularly in transplantation, reflects this.

Models of Care

NHS Blood and Transplant (NHSBT) is commissioned to deliver deceased organ donation retrieval, whilst living kidney donation is commissioned by the health Departments in each UK country and by NHS England as part of the transplantation pathway.

There are currently 23 adult kidney transplant centres across the UK each providing transplantation services, and most receive referrals from one or more non-transplanting centres. Preparation and follow-up of living donors and recipients is shared between ‘linked’ transplant and referring nephrology units within a ‘transplant hub and non-transplanting spoke’ model of care.

Deceased Organ Donation

The UK model for deceased organ donation is based upon a whole hospital approach to promote and maximise each donation opportunity. In each Trust/Board teams of Specialist Nurses in Organ Donation (SNODS) work collaboratively with Clinical Leads in Organ Donation (CLODS, senior intensive care doctors) and the Trust Organ Donation Committee.

The nursing workforce, employed directly by NHSBT, is organised into regional teams, each team varies in geographical size, the number of hospitals within each region and the donation potential and the workforce is distributed accordingly.

The current workforce comprises SNODs, team managers and regional managers, each of whom is responsible for two geographical regions.

The service is also supported by UK-wide lead nurse posts that provide leadership and support, including diversity and paediatric donation, plus a professional development team that is responsible for all specialist nurse training and education. The National Organ Retrieval Service (NORS) was established in 20107 and NHSBT have introduced new nursing roles to support this, employing experts to meet the training and development needs of the new and existing workforce, oversee workforce transformation and provide appropriate professional leadership.

Living Kidney Donation

Living donor coordinators (LDCs) are employed within individual Trusts to co-ordinate donor evaluation and oversee continuity of care throughout the pathway.7 In 2019, every transplant centre and non-transplanting referring centre had at least one nurse supporting living donor kidney transplantation. In 2014 (updated 2015), NHSBT developed
an LDC workforce planner taking into account the key variables that impact on the role to provide an objective measure of workforce requirements by centre/unit for living donor kidney transplantation. It provides an objective measure of LDC workforce requirements.  

Recipient Co-ordinator
Recipient co-ordinators’ responsibilities include maintaining transplant waiting lists, recipient preparation for transplantation and recipient post-transplant follow-up. To date, a bespoke workforce calculator has not been produced to assess workforce requirements, however, the LDC workforce calculator could be adapted for this purpose.

Post-transplant Nursing
Models of care vary from completely nurse-led to collaborative MPT-style and workforce requirements must be adjusted accordingly. As with other specialist nurse roles within kidney care there are no specific tools available to calculate care requirements or optimum nursing levels in the out-patient environment. A workforce calculator, similar to the LDC tool, would be helpful to support future developments. However patient self-reported outcomes measures (PREM, PROM) and Getting It Right First Time (GIRFT) may be helpful to influence future workforce development.

Looking ahead
The current strategies for organ donation and transplantation ended in March 2020 and a new UK strategy has been launched, combining both deceased and living donor transplantation and aiming to close the gap between supply of organs available for transplant and the demand for transplantation. Sustainability is at the heart of the next strategy; new ways of working and objective measures of workforce requirements, which accurately reflect centre differences in case-mix, size and complexity of programmes, are needed to underpin service delivery.

Table 2 (at the end of this section, on page 15) shows a suggested workforce and career framework using the non-medical clinical career framework produced by Skills for Health to describe levels of competence and provide a consistent language for each role.  

Safer care and patient acuity tools

Nursing workload and the ability to provide good care is influenced by many variables including patient acuity and dependency and other issues including quality indicators and professional judgement (Figure 1) as identified in the Nursing Staffing Levels (Wales) Act [2016].

It is recognised that the acuity level of patients in both inpatient and outpatient areas has increased in recent years, and most projections suggest this trend will continue. Renal Registry data show an increase in prevalence and age of the dialysis population, which will inevitably have a significant impact on staffing levels both in terms of absolute numbers and skill mix of nursing staff. Tools for measuring patient acuity levels in inpatient areas are well developed and validated. The Safer Nursing Care Tool developed by the Shelford Group is recommended for use within NHS inpatient areas and we would recommend the use of that tool in assessing acuity levels in renal ward areas (Table 1). This tool uses a multiplier based on levels of care and care requirements.
**TABLE 1. SHELFDOR SAFER NURSING CARE TOOL.**

<table>
<thead>
<tr>
<th>Levels of Care</th>
<th>Descriptor</th>
</tr>
</thead>
</table>
| **Level 0 (Multiplier = 0.99*)**<br>Patient requires hospitalisation. Needs met by provision of normal ward cares | Care requirements may include the following:  
  - Elective medical or surgical admission  
  - May have underlying medical condition requiring on-going treatment  
  - Patients awaiting discharge  
  - Post-operative/post-procedure care - observations recorded half hourly initially then 4-hourly  
  - Regular observations 2-4 hourly  
  - Early Warning Score is within normal threshold  
  - Electrocardiogram (ECG) monitoring  
  - Fluid management  
  - Oxygen therapy less than 35%  
  - Patient-controlled analgesia  
  - Nerve block  
  - Single chest drain  
  - Confused patients not at risk  
  - Patients requiring assistance with some activities of daily living, require the assistance of one person to mobilise, or experiences occasional incontinence |
| **Level 1a (Multiplier = 1.39*)**<br>Acutely ill patients requiring intervention or those who are UNSTABLE with a GREATER POTENTIAL to deteriorate. | Care requirements may include the following:  
  - Increased level of observations and therapeutic interventions  
  - Early Warning Score - trigger point reached and requiring escalation  
  - Post-operative care following complex surgery  
  - Emergency admissions requiring immediate therapeutic intervention  
  - Instability requiring continual observation/invasive monitoring  
  - Oxygen therapy greater than 35% +/- chest physiotherapy 2-6 hourly  
  - Arterial blood gas analysis – intermittent  
  - Post 24 hours following insertion of tracheostomy, central lines, epidural or multiple chest or extra ventricular drains  
  - Severe infection or sepsis |
| **Level 1b (Multiplier = 1.72*)**<br>Patients who are in a STABLE condition but are dependent on nursing care to meet most or all of the activities of daily living | Care requirements may include the following:  
  - Complex wound management requiring more than one nurse or takes more than one hour to complete  
  - Vacuum assisted closure (VAC) therapy where ward-based nurses undertake the treatment  
  - Patients with spinal instability/spinal cord injury  
  - Mobility or repositioning difficulties requiring the assistance of two people  
  - Complex intravenous drug regimens (including those requiring prolonged preparatory/administration/post-administration care)  
  - Patient and/or carers requiring enhanced psychological support due to poor disease prognosis or clinical outcome  
  - Patients on End of Life Care Pathway  
  - Confused patients who are at risk or requiring constant supervision  
  - Requires assistance with most or all activities of daily living  
  - Potential for self-harm and requires constant observation  
  - Facilitating a complex discharge where this is the responsibility of the ward-based nurse |
| **Level 2 (Multiplier = 1.97*)**<br>May be managed within clearly identified, designated beds, resources with the required expertise and staffing level OR may require transfer to a dedicated Level 2 facility/unit | Care requirements may include the following:  
  - Deteriorating/compromised single organ system  
  - Post-operative optimisation (pre-op invasive monitoring)/extended post-op care  
  - Patients requiring non-invasive ventilation/respiratory support; continuous positive airway pressure (CPAP)/Bilevel Positive Airway Pressure (BiPAP) in acute respiratory failure  
  - First 24 hours following tracheostomy insertion  
  - Requires a range of therapeutic interventions including:  
    - Greater than 50% oxygen continuously  
    - Continuous cardiac monitoring and invasive pressure monitoring  
    - Drug infusions requiring more intensive monitoring e.g. vasoactive drugs (amiodarone, inotropes, Glyceryl trinitrate [GTN]) or potassium, magnesium  
    - Pain management intrathecal analgesia  
    - Central nervous system (CNS) depression of airway and protective reflexes  
    - Invasive neurological monitoring |
| **Level 3 (Multiplier = 5.96*)**<br>Patients needing advanced respiratory support and/or therapeutic support of multiple organs | Care requirements may include the following:  
  - Monitoring and supportive therapy for compromised/collapse of two or more organs/systems  
  - Respiratory or central nervous system (CNS) depression/compromise requires mechanical/invasive ventilation  
  - Invasive monitoring, vasoactive drugs, treatment of hypovolaemia/sepsis or neuroprotection |
The safer care model uses a multiplier allied to acuity and dependency measurements to calculate numbers of whole time equivalent for inpatient care as seen in Figure 2.

**FIGURE 2. NUMBERS OF WHOLE TIME EQUIVALENT FOR INPATIENT CARE CALCULATED USING THE SAFER CARE MODEL**

<table>
<thead>
<tr>
<th>Level</th>
<th>WTE nurse per bed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.99*</td>
</tr>
<tr>
<td>1a</td>
<td>1.39*</td>
</tr>
<tr>
<td>1b</td>
<td>1.72*</td>
</tr>
<tr>
<td>2</td>
<td>1.97*</td>
</tr>
<tr>
<td>3</td>
<td>5.96*</td>
</tr>
</tbody>
</table>

* this includes a 22% uplift for annual leave, study leave etc.

For example, if a 28-bedded ward has 12 patients at Level 0, 7 patients at Level 1a, 8 patients at Level 1b, and 1 patient at Level 2, a total of 37.34 WTE nursing staff would be required.

This number is a baseline against which to set nurse staffing levels. Two 28-bedded wards may have different activity. One may have few admissions, discharges or ward attenders, whereas another may have many. Professional judgement is required to ensure that establishments are adjusted appropriately under these circumstances.

Nurse Sensitive Indicators\(^1\)\(^2\) can also be used to ascertain the impact of acuity, dependency and activity on quality outcomes. These are quality indicators that can be linked to nurse staffing issues, including leadership, establishment levels, skill-mix and training and development of staff. Such information can be used to further support ward staffing requirements identified through acuity and dependency measurement.

Data collected by the Renal Registry and Kidney Care UK patient reported outcome measures (PROMS) and patient reported experience measures (PREMS) surveys and the GIRFT peer reviews highlight areas of exemplar practices and areas requiring improvement.\(^1\)\(^3\) These resources can be powerful in influencing future workforce development.

The National Institute for Health and Care Excellence (NICE) also have safe staffing guidelines for adult inpatient wards in acute hospitals which can reasonably be applied in renal inpatient areas.\(^1\)\(^4\)

Finally, the NHS in Wales have mandatory safe staffing levels under the auspice of the Nurse Staffing Levels (Wales) Act 2016 which should be applied to all areas in Wales but may also provide guidance in other areas of the United Kingdom and it is possible that similar legislation may be passed for the NHS in England and/or Northern Ireland.\(^1\)\(^5\)

Acuity tools for haemodialysis areas are less well developed, and the inpatient tools available do not tend to suit these areas very well. We believe that work still needs doing to test and validate tools for use in dialysis areas, although a Renal Dialysis Patient Dependency Classification Instrument (RDPDC) has been introduced and validated in the Republic of Ireland which does provide a useful tool for assessment of patient acuity levels in haemodialysis areas (Appendix I).\(^1\)\(^6\) Appendix II gives an example of how the Shelford acuity tool has been adopted for haemodialysis (Courtesy of Kent Kidney Care Centre).

Skill mix decisions rely on consideration of the levels of experience and competency of nursing staff within areas and this should be supported by renal-specific nurse education and professional development programmes including the use of nursing competencies, such as those developed by Skills for Health.\(^9\)

Haemodialysis nursing requires the skills and competencies to manage both the technical aspect of the haemodialysis process and the holistic care of patients receiving this form of renal replacement therapy. The majority of patients wish to dialyse close to their homes often in satellite dialysis, such that the staffing levels and skill mix should reflect the patient case mix and the changing workforce. The staffing ratios and skill mix should be assessed locally in relation to both case mix and patient dependency/acuity and recruitment and retention in line with the national agenda for workforce planning and development.

Peritoneal dialysis (PD) nursing also requires the skills and competencies to manage both the technical aspect of the peritoneal dialysis process and the holistic care of patients receiving this form of renal replacement therapy. The National PD Forum have identified many ways of working for PD nurses from providing a standalone PD service, to those combined with Home therapies, or pre-dialysis. The way in which the services are designed will impact on the skills competencies and levels of practice within the workforce. Currently there are no specific acuity tools available that have been validated for use in this area.
2.2 PAEDIATRICS

There are 13 paediatric nephrology centres in the UK of which 10 provide renal transplantation. The model of service delivery provided by each centre varies across the country due to the geographical area cover, the number of hospitals from which the tertiary centre receives referrals and the populations served. Many children live long distances from their tertiary renal centre and, where appropriate, care is delivered by local services.

Paediatric renal nursing is becoming increasingly complex due to parental expectations and the increased numbers of patients with co-morbidities opting for renal replacement therapies extending from neonates to adolescents and young people. There are now more renal units in the UK that have the resources and medical expertise to offer this choice. There is also the added dimension of growth and development and supporting the family and extended family which adds another layer of complexity in healthcare delivery. The Royal College of Nursing attempted to define staffing levels for children and young people’s services in specialist children’s wards and departments, however there was no direct reference to how this could be interpreted in an inpatient renal unit, or for haemodialysis and specialist paediatric renal nursing roles. Many tertiary centres will cohabit their ward with other specialties creating challenges when trying to decipher staffing levels and skill mix. Appendix II gives an example of an adapted Safer Nursing Care Tool for Paediatric Haemodialysis. Figure 3 an example of inpatient staffing levels and Figure 4 specialist nurse caseload.

There are varying configurations of children’s in-patient renal services and therefore some units are required to offer an on-call renal nursing service to offer dialysis or specialist advice outside of working hours. Staffing levels will be dependent on the on-call time period covered by the renal nursing team in each unit.

**FIGURE 3. NURSE STAFFING REQUIREMENTS FOR CHILDREN’S INPATIENT RENAL SERVICES**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Staff Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>General paediatric nephrology beds</td>
<td>1:3 to 1:4</td>
</tr>
<tr>
<td>High dependency nephrology beds</td>
<td>1:1 to 1:2</td>
</tr>
<tr>
<td>Immediate post-operative care of transplants</td>
<td>1:1 (for 48 hours for &gt; 5 year olds; for 72 hours for &lt; 5 year olds)</td>
</tr>
</tbody>
</table>

**FIGURE 4. CASELOAD MANAGEMENT FOR SPECIALIST PAEDIATRIC RENAL NURSES**

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Caseload Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home peritoneal dialysis</td>
<td>1:10</td>
</tr>
<tr>
<td>Home Haemodialysis</td>
<td>1:10</td>
</tr>
<tr>
<td>Pre-transplant</td>
<td>1:50</td>
</tr>
<tr>
<td>Transplantation</td>
<td>1:100</td>
</tr>
<tr>
<td>Nephrotic Nurse</td>
<td>1:300</td>
</tr>
</tbody>
</table>

Advanced practice

The increasing number of children with End-Stage Kidney Disease has led to an ideal environment for the advanced practice roles to help meet the capacity, demand and complex needs of patients. Advanced practice roles encompass aspects of education, research and management but are grounded in direct care provision. These advanced roles can help paediatric renal centres to bridge the gap between nursing and medical care, ultimately improving patient experience and care.

Education and training

Education and the maintenance of competence in paediatric renal nursing is imperative for safe and sustainable care. Consequently, a practice educator is required to ensure nursing staff working in specialist areas undertake continuing education to maintain high standards. Paediatric nephrology wards and dialysis units should ideally be managed on a day-to-day basis by a registered children’s nurse with a university-accredited specialist paediatric renal nursing course.

Transition

Increasing numbers of children with chronic kidney disease are now surviving into adult life. It is recognised that there are substantial risks of non-adherence at the time of transfer from paediatric to adult care and amongst young people. The Care Quality Commission highlighted the need for a key accountable individual responsible for supporting their move to adult health services. A dedicated paediatric renal transition nurse may be of benefit for larger renal centres.

Specialist paediatric renal nurses

Specialist paediatric renal nursing care varies from completely nurse-led to collaborative MPT-style and workforce requirements must be adjusted accordingly. In some units, the specialist nurse will manage a caseload of a combination of dialysis modalities, i.e. PD, HD and HHD. There are no specific tools available to calculate care requirements or optimum nursing levels in the outpatient environment. Again, patient self-reported outcomes measures (PREM, PROM) and GIRFT may be helpful to influence future workforce development.
### TABLE 2. SKILLS FOR HEALTH CAREER FRAMEWORK FOR ADULT AND PAEDIATRIC NURSING

<table>
<thead>
<tr>
<th>Level</th>
<th>Explanation</th>
<th>Career Level</th>
<th>Descriptor</th>
<th>Examples in practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>• Require highly specialised knowledge, some of which is at the forefront of knowledge in a field of work&lt;br&gt;• Leaders with considerable responsibility, and the ability to research and analyse complex processes&lt;br&gt;• Have responsibility for service improvement or development&lt;br&gt;• May have considerable clinical and/or management responsibilities, be accountable for service delivery or have a leading education or commissioning role</td>
<td>Consultant practitioner&lt;br&gt;Independent practitioner&lt;br&gt;MSc/PhD - Service Development, lead educator and clinical supervisor</td>
<td>Job plan structured around 4 domains:&lt;br&gt;• Expert practice (as below for advanced clinical practitioner)&lt;br&gt;• Professional leadership and consultancy&lt;br&gt;• Education, training and development&lt;br&gt;• Practice and service development, research and evaluation Works independently within Trust/organisation and professional guidelines Accountable for own practice and patient care</td>
<td>• Chronic kidney disease&lt;br&gt;• Inpatient/day care&lt;br&gt;• Transplantation&lt;br&gt;• Ward care – inpatient/day care&lt;br&gt;• Peritoneal dialysis&lt;br&gt;• In centre haemodialysis (acute or chronic, satellite)&lt;br&gt;• Combined home therapies&lt;br&gt;• Research</td>
</tr>
<tr>
<td>7</td>
<td>• Have a critical awareness of knowledge issues in the field and at the interface between different fields&lt;br&gt;• They are innovative and have a responsibility for developing and changing practice and/or services in a complex and unpredictable environment</td>
<td>Advanced clinical practitioner&lt;br&gt;Independent practitioner&lt;br&gt;MSc - continually learning and facilitating learning for others</td>
<td>• Advanced patient assessment&lt;br&gt;• Independently prescribing treatments and medicines&lt;br&gt;• Patient pathway planning and implementation&lt;br&gt;• Refer and discharge patients&lt;br&gt;• Works independently within trust and professional guidelines Accountable for own practice and patient care</td>
<td>• Chronic kidney disease&lt;br&gt;• Advanced kidney care&lt;br&gt;• Transplantation&lt;br&gt;• Inpatient/day care&lt;br&gt;• Peritoneal dialysis&lt;br&gt;• Combined home therapies&lt;br&gt;• In centre haemodialysis (acute or chronic, satellite)&lt;br&gt;• Community CKD link/education&lt;br&gt;• Research</td>
</tr>
<tr>
<td>6</td>
<td>• Require a critical understanding of detailed theoretical and practical knowledge&lt;br&gt;• Specialists and/or have management and leadership responsibilities&lt;br&gt;• Demonstrate initiative and are creative in finding solutions to problems&lt;br&gt;• Some responsibility for team performance and service development and they consistently undertake self-development</td>
<td>Specialist/senior practitioner&lt;br&gt;Works within a defined scope of practice&lt;br&gt;Specialist/post graduate studies</td>
<td>• Specialist knowledge and skills in defined area&lt;br&gt;• May prescribe medicines&lt;br&gt;• Required to make judgments based on theoretical and practical knowledge&lt;br&gt;• Accountable for own practice and patient care</td>
<td>• Chronic kidney disease&lt;br&gt;• Advanced kidney care&lt;br&gt;• Transplantation&lt;br&gt;• Peritoneal dialysis&lt;br&gt;• Home haemodialysis management and training&lt;br&gt;• Dialysis access&lt;br&gt;• Anaemia management&lt;br&gt;• Bone management&lt;br&gt;• Research</td>
</tr>
<tr>
<td>5</td>
<td>• Require a comprehensive, specialised, factual and theoretical knowledge within a field of work and an awareness of the boundaries of that knowledge&lt;br&gt;• Can use knowledge to solve problems creatively, make judgments which require analysis and interpretation, and actively contribute to service and self-development. May have responsibility for supervision of staff or training</td>
<td>Practitioner/registered practitioner&lt;br&gt;Degree studies</td>
<td>• Professional registration and continuous professional development (CPD)&lt;br&gt;• Comprehensive specialised, factual and theoretical knowledge&lt;br&gt;• Required to make judgments and recognise own boundaries of knowledge&lt;br&gt;• Accountable for own practice and patient care</td>
<td>• Chronic kidney disease&lt;br&gt;• Advanced kidney care&lt;br&gt;• Transplantation&lt;br&gt;• Peritoneal dialysis&lt;br&gt;• Home haemodialysis&lt;br&gt;• Inpatient ward&lt;br&gt;• Day care&lt;br&gt;• Outpatient areas</td>
</tr>
<tr>
<td>4</td>
<td>• Require factual and theoretical knowledge in broad contexts within a field of work. Work is guided by standard operating procedures, protocols or systems of work, but the worker makes judgements, plans activities, contributes to service development and demonstrates self-development.&lt;br&gt;• May have responsibility for supervision of some staff</td>
<td>Associate&lt;br&gt;Guidance and supervision available when needed&lt;br&gt;Foundation degree studies&lt;br&gt;</td>
<td>Associate practitioner:&lt;br&gt;• Knowledge of facts, processes, principles and concepts within specified field of work&lt;br&gt;• Knowledge of facts, processes, principles and general concepts within nursing&lt;br&gt;• Carries out clinical/technical work to established protocols and procedures&lt;br&gt;• Responsible for personal development&lt;br&gt;• Accountable to registered practitioner in area of work</td>
<td>• Ward care – inpatient/day care&lt;br&gt;• Outpatient care&lt;br&gt;• Peritoneal dialysis&lt;br&gt;• Home therapies&lt;br&gt;• Haemodialysis (with additional training and assessment in intravenous administration of drugs)</td>
</tr>
<tr>
<td>3</td>
<td>• Require knowledge of facts, principles, processes and general concepts in a field of work&lt;br&gt;• May carry out a wider range of duties than the person working at level 2, and will have more responsibility, with guidance and supervision available when needed&lt;br&gt;• Contribute to service development and are responsible for self-development</td>
<td>Support worker&lt;br&gt;Directly supervised&lt;br&gt;A Level/NVQ/apprenticeship&lt;br&gt;</td>
<td>Responsible for personal development&lt;br&gt;Works to established protocols and procedures&lt;br&gt;Accountable to registered practitioner in area of work</td>
<td>• Ward care – inpatient/day care&lt;br&gt;• Outpatient care&lt;br&gt;• Peritoneal dialysis&lt;br&gt;• Home therapies&lt;br&gt;• Haemodialysis</td>
</tr>
</tbody>
</table>
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18. Royal College of Nursing. Defining staffing levels for children and young people’s services. RCN Standards for clinical professional service managers https://www.rcn.org.uk/get-help/rcn-advice/staffing-levels

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## APPENDIX I - IRISH HEALTH SERVICE EXECUTIVE RENAL DIALYSIS PATIENT DEPENDENCY CLASSIFICATION INSTRUMENT

### 1. Age
- Score
- 18-64: 1
- 65-74: 2
- 75+: 3

### 2. Co-morbidity
- Score
- Intervention not required: 0
- Intervention required: 1
- Intervention required -1: 2
- Intervention required -2: 3
- Intervention required -3: 4
- Intervention required -4: 5

### 3. Physical
- Nutrition
  - Requires minimal assistance at mealtime: 1
  - Requires significant assistance at mealtime: 2
- Self Care
  - Requires no assistance: 0
  - Requires assistance at intervals: 1
  - Requires assistance with walking: 2
  - Requires assistance with mobilisation: 3
  - Depends on carers for mobilisation: 4
- Mobilisation
  - Requires no assistance: 0
  - Requires assistance at intervals: 1
  - Requires assistance with walking: 2
  - Requires assistance with mobilisation: 3
- Waterlow
  - Not at risk: 0
  - 10+ at risk: 1
  - 15+ high risk: 2
  - 20+ very high risk: 3
- Wound care
  - No wound: 0
  - Simple wound: 1
  - Vascular access site requiring intervention (infected): 2
  - Complex wound: 3
- Vital signs - requirement for intervention
  - Not at risk: 0
  - 10+ at risk: 1
  - 15+ high risk: 2
  - 20+ very high risk: 3
- Access
  - Good functioning CVC, includes standard access site dressing: 1
  - Good functioning CVC < 300 ml/min: 2
  - Poor functioning CVC: 3
  - Poor functioning AVF/AVG < 350 ml/min: 4
  - Poor functioning AVF/AVG multiple interventions: 5
  - Poor functioning CVC multiple interventions: 6
- Stability on dialysis
  - Stable on dialysis: 0
  - Decrease in B/P. Min intervention. Full recovery: 1
  - Decrease in B/P + muscle cramps. Min intervention Full recovery: 2
  - Recurring episodes of decrease BP +/- Some recovery. Monitoring required: 3
  - Decrease BP +/- no recovery. Requiring treatment stop. Monitoring + investigation: 4

### 4. Psycho-social
- Orientation
  - Orientated: 0
  - Occasional forgetfulness / requires re-orientation: 1
  - Disoriented to time and place. Requires re-orientation regularly: 2
  - Confused / disorientated requiring constant supervision: 3
- Behaviour
  - Relaxed, no behavioural problems/challenges: 0
  - Restless / irritable at times: 1
  - Challenging - Verbal or physical: 2
  - Un-predictable challenging, requiring intervention: 3
  - Confused / disorientated requiring constant supervision: 4
- Communication
  - No communication challenges (verbal & non-verbal): 0
  - Some difficulty understanding what is said: 1
  - Often unresponsive to verbal commands, interaction and suggestions: 2
  - Lack of comprehension / understanding: 3
- Language
  - Fluent in English: 0
  - Difficulty with English: 1
  - Social support
    - Good social support: 0
    - Poor social support: 1
  - Total: 4

### 5. Dialysis
- Access
  - Good functioning CVC, includes standard access site dressing: 1
  - Good functioning CVC < 300 ml/min: 2
  - Poor functioning CVC: 3
  - Poor functioning AVF/AVG < 350 ml/min: 4
  - Poor functioning AVF/AVG multiple interventions: 5
  - Poor functioning CVC multiple interventions: 6
- Fluid restriction adherence
  - Intradermal fluid gain typically < 1.5 litres: 0
  - Intradermal fluid gain typically 1.5-2 litres: 1
  - Intradermal fluid gain typically 2.5-3 litres: 2
  - Intradermal fluid gain typically > 3.5 litres: 3
- Medication regime adherence
  - Awareness and demonstrates adherence and/or knowledge of routine medications: 1
  - May need occasional educational input to improve knowledge and/or adherence: 2
  - On regular basis demonstrates a lack of knowledge and/or adherence (at each routine check): 3
  - On going issues with knowledge deficits and/or adherence with routine medications: 4
- Total: 17

### Patient dependency category
- Score
- Standard care: 0-12: 1
- High care: 19+: 3

### Score
- Total score: 4
- Sections
  - 1. Age
  - 2. Co-morbidity
  - 3. Physical
  - 4. Psycho-social
  - 5. Dialysis

### Additional category
- Language
  - Requires interpreter: 1
  - High Care - 3

### Total score
- Patient dependency category
  - Score
  - Standard care: 0-12: 1
  - High care: 19+: 3

### Nurse Assessor: 

### Date: 

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**Hospital details**

**Patient details**
### APPENDIX II - EXAMPLE OF ADAPTED SAFER NURSING CARE TOOL FOR ADULT HAEMODIALYSIS

<table>
<thead>
<tr>
<th>Levels of care</th>
<th>Inclusion criteria</th>
<th>Care required</th>
<th>Staffing ratio</th>
</tr>
</thead>
</table>
| Level 0        | Patients whose needs can be met through normal haemodialysis care | • Chronic, stable HD patient  
• May have other co-morbidity: diabetes, COPD, hypertension, stable ischaemic heart disease, focal deficit/Neuromuscular disease, chronic pain  
• Pre-operative patient requiring haemodialysis  
• No HD access problems  
• On-going assessment of dry weight  
• Self-care patients  
• Patients requiring 1 person assistance with some ADL or experiences occasional incontinence  
• DNA patient requiring follow-up appointments | • Routine HD assessment & observations incl. fluid assessment, blood sugar monitoring  
• Monthly bloods  
• Intravenous iron administration  
• Erythropoetin administration  
• Health advice and promotion of self-care  
• Routine antibiotic treatment (incl. level monitoring)  
• INR screening for Warfarin prescription  
• Routine referral to MPT  
• Rearrangements of haemodialysis appointment, hospital transport etc. | 1:4 |
| Level 1        | Patients – appropriately managed on a dialysis unit but requires or more than baseline resources | • Acute exacerbation of existing medical condition and/or deteriorating while on dialysis  
• At risk of frequent hypertensive episodes  
• Post-operative/invasive investigation incl. past parathyroidectomy  
• At risk of bleeding  
• Requires blood transfusions  
• Symptomatic fluid overload requiring regular monitoring  
• Sepsis  
• Unstable patient being dialysed in isolation | • ½ hourly observation  
• Frequent blood testing and monitoring  
• Blood transfusion  
• Sepsis, on vancomycin and/or gentamicin  
• Oxygen therapy requiring oxygen saturation monitoring  
• Sliding scale of insulin  
• Monitoring actual clotting times  
• Requiring urgent consultation from medical team and/or arranging transport | 1:3 |
| Level 1A       | Increased acuity patients have become acutely ill requiring intervention Those who are unstable with a greater potential to deteriorate | • HD access problems requiring intervention: on-going needle repositioning (AVF/AVGS); poor line flows  
• Clotting blood circuits during HD  
• First dialysis and assessment  
• Patient with prolonged bleeding time from AVF/AVG requiring intervention  
• Reduced mobility – requires 2 staff assistance with ADL or repositioning  
• Patient known to be violent and aggressive  
• Confused patient  
• Patients requiring mental health intervention  
• Isolated patient | • Frequent nursing intervention due to access problems  
• Frequent intervention to resolve clotted blood circuits  
• Thrombolytic lack past HD  
• Intervention required for prolonged bleeding time e.g. Applying extended pressure to access ≥ 15 minutes  
• Two person assistance with ADL due to reduced mobility  
• Intervention required for psychological or psychiatric problems  
• Isolation procedure  
• Complicated referrals to MPT | 1:3 |
| Level 1B       | Increased dependence – Patients who are in a stable condition but have an increased dependence on nursing support | • New acute dialysis patient ≤ 10 days on dialysis  
• Patients with acute kidney injury  
• Patients requires plasma exchange/filtration  
• Patients requires ‘on call’ dialysis  
• Haemodynamic instability  
• Continued observation  
• ⅓ to ⅔ hourly observations  
• Requiring vasoactive drug infusion  
• Requiring non-invasive ventilation/respiratory support – CPAP/BiPAP in acute respiratory failure  
• Care of chest tube, tracheostomy, epidural or PCA  
• Continuous cardiac monitoring and invasive pressure monitoring | 1:2 |
| Level 2        | Patients who are unstable and at risk or deteriorating with uncorrected major physiological abnormalities whose needs cannot be met through normal haemodialysis care | • Patients requiring dialysis in ITU  
• Patients transferred from ITU with unstable cardiac condition, who are haemorrhaging or respiratory instability  
• Patients requiring dialysis in an ITU environment/requiring ventilation  
• Respiratory or CNS depression/compromise requires mechanical/ invasive ventilation  
• Invasive monitoring | 1:1 |
| Level 3        | Patients needing advanced respiratory support and/or therapeutic support of multiple organs | • Patients requiring dialysis in ITU  
• Patients transferred from ITU with unstable cardiac condition, who are haemorrhaging or respiratory instability  
• Patients requiring dialysis in an ITU environment/requiring ventilation  
• Respiratory or CNS depression/compromise requires mechanical/ invasive ventilation  
• Invasive monitoring | 1:1 |

ADL, activities of daily living; AVF, arteriovenous fistula; AVG, arteriovenous graft; BiPAP, bilevel positive airway pressure; CNS, central nervous system; COPD, chronic obstructive pulmonary disease; CPAP, continuous positive airway pressure; DNA, did not attend; HD, haemodialysis; INR, international normalised ratio; ITU, intensive therapy unit; MPT, multi-professional team; PCA, patient controlled analgesia.
### APPENDIX III - EXAMPLE OF ADAPTED SAFER NURSING CARE TOOL FOR PAEDIATRIC HAEMODIALYSIS

<table>
<thead>
<tr>
<th>Levels of care</th>
<th>Inclusion criteria</th>
<th>Care required</th>
<th>Staffing ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td>Patients whose needs can be met through basic haemodialysis care</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Chronic, stable HD patient</td>
<td>• Routine HD assessment &amp; observations including fluid assessment</td>
<td>1:3</td>
</tr>
<tr>
<td></td>
<td>• No HD access problems</td>
<td>• Hourly observations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pre-operative patient requiring HD</td>
<td>• Monthly bloods</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ongoing assessment of dry weight</td>
<td>• Intravenous iron administration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Competent self-care patients</td>
<td>• Erythropoietin administration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Over 5 years of age</td>
<td>• Routine chronic renal failure medication administration</td>
<td></td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td>Patients appropriately managed on a dialysis unit but requires more than baseline resources</td>
<td></td>
<td>1:2</td>
</tr>
<tr>
<td></td>
<td>• First dialysis session and assessment</td>
<td>• Half hourly observation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Under 5 years of age with a carer</td>
<td>• Frequent blood testing and monitoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• At risk of frequent hypertensive episodes</td>
<td>• Blood transfusion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Post-operative</td>
<td>• Albumin infusions/primes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• At risk of bleeding</td>
<td>• IV antibiotic treatment (incl. level monitoring)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Requires blood transfusions</td>
<td>• Frequent nursing intervention with dialysis vascular access</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Unstable patient being dialysed in isolation</td>
<td>• Frequent referral to psychosocial team and/or escalation using acceptable behaviour policy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Challenging ultrafiltration</td>
<td>• Intervention required for bleeding around needle sites during the HD session and/or prolonged bleeding time at needle removal from AVF e.g. Applying extended pressure to access ≥ 20 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Challenging behaviour</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Needle phobias with AVF cannulation</td>
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<tr>
<td></td>
<td>• Tracheostomy and/or chronic ventilation cared for by additional carer/parent</td>
<td></td>
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<tr>
<td></td>
<td>• Complex medical conditions e.g. MMA</td>
<td></td>
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<tr>
<td></td>
<td>• HD access problems requiring intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Patient with bleeding over needle sites and/or prolonged bleeding time requiring intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level 3</strong></td>
<td>Increased dependence - patients who are acutely unwell or have a greater potential to deteriorate on a HD unit</td>
<td></td>
<td>1:1 *</td>
</tr>
<tr>
<td></td>
<td>• Acutely unwell e.g. sepsis, pulmonary oedema, hypertension, AKI</td>
<td>• Intervention required for psychological or psychiatric problems</td>
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<td></td>
<td>• Acute behavioural issues, aggression, confusion</td>
<td>• Continuous cardiac monitoring</td>
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<td></td>
<td>• End-stage dialysis</td>
<td>• Single needle dialysis due to patient weight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tracheostomy and/or chronic ventilation cared for by nursing staff</td>
<td>• Blood circuit primes</td>
<td></td>
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<tr>
<td></td>
<td>• Extracorporeal therapies i.e. LDL apheresis, IA, DFPP</td>
<td>• Albumin infusions</td>
<td></td>
</tr>
<tr>
<td><strong>Level 4</strong></td>
<td>Patients in intensive care who require RRT</td>
<td></td>
<td>2:1</td>
</tr>
<tr>
<td></td>
<td>• AKI due to multi-organ failure or other medical complication**</td>
<td>• CRRT from intensive care team due to instability of patient</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Known renal patient on PICU</td>
<td>• Some renal teams will provide dialysis and apheresis to PICU environments</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Renal team may choose to provide dialysis in children with AVF’s to preserve vascular access</td>
<td></td>
</tr>
</tbody>
</table>

AKI, acute kidney injury; AV, arteriovenous fistula; CRRT, continuous renal replacement therapy; DFPP, Double Filtration Plasmapheresis; HD, haemodialysis; IA, intra-arterial; INR, international normalised ratio; LDL, low density lipoprotein; MPT, multi-professional team; MMA, Methylmalonic Acidemia; PICU, paediatric intensive care; UF, ultrafiltration.