



THERAPIES: PHYSIOTHERAPY, OCCUPATIONAL THERAPY AND CLINICAL EXERCISE PHYSIOLOGY

Introduction

The number of people living with kidney disease is expected to rise over the next few years and add continuing pressure to an already stretched healthcare service.¹ The symptoms of stages 1-5 Chronic Kidney Disease (CKD) can lead to significant functional deterioration and reduced quality of life, contributing to recurrent and extended hospital admissions.^{2,3} Studies have shown a close correlation between End-Stage Kidney Disease and cognitive impairment, which affects an estimated 16-38% of these patients.⁴ People living with kidney disease have complex and changing physical activity levels, physical function and exercise requirements depending on the degree of renal impairment, co-morbidity, modality of treatment and medications. Helping people living with kidney disease to maintain independence to function optimally, often requires assessment and support from renal specialist physiotherapists, occupational therapists, clinical exercise physiologists and therapy assistants. The increasingly complex care requirements of people living with kidney disease are often compounded by malnutrition and prolonged hospitalisation. Recurrent episodes of illness and hospitalisation related to infection, surgery and cardiovascular disease are causes of muscle wasting, reduced physical functioning and deconditioning which require continuing rehabilitation support. In addition, the impact of unplanned dialysis requires intensive rehabilitation.

The British Association of Sport and Exercise Sciences (BASES) expert statement on exercise therapy for people living with kidney disease outlines the need for renal rehabilitation services across the trajectory of kidney disease.⁵ It recommends that “renal rehabilitation services should aim to increase physiological reserve capacity, improve muscular strength and reduce physical function limits (or prevent further deterioration for as long as possible), to reduce number and severity of CKD specific symptoms”.⁵ Exercise rehabilitation interventions in CKD have been shown to improve physical fitness and physical function.^{6,7}

The professions involved in the delivery of a Renal Therapy Service include renal physiotherapists, occupational therapists, clinical holistic exercise physiologists, alongside therapy support staff. The roles of these professions are described below, and the components of a renal therapy service are summarised in Table 1 on page 56.

7.1 PHYSIOTHERAPY

Physical inactivity has been identified as an independent risk factor for accelerated deterioration of kidney function, physical dysfunction, poor cardiovascular respiratory and metabolic health, and lower levels of quality of life in people living with in all stages of kidney disease.⁵ Renal physiotherapists are ideally placed within the NHS setting to assist patients with mobility, balance, physical activity and exercise interventions. Individualised exercise and physical activity advice, from specialist physiotherapists working as part of the renal MPT is essential for person-centred care and recovery. In an inpatient setting, the renal physiotherapist role involves assessment of mobility and rehabilitation needs to facilitate a safe and effective discharge. This includes a comprehensive physical assessment to determine mobility, function and balance and potential to benefit from further rehabilitation, followed by an individualised treatment plan to ensure optimal recovery, return to baseline level of function where possible, and safe and effective discharge to an appropriate setting, with follow-on care as required.

In the outpatient setting, renal physiotherapists should be involved in renal rehabilitation services, renal specific weight management clinics, assessment clinics and kidney transplant clinics. Physiotherapist involvement is also key to the implementation and delivery of intradialytic exercise programmes for people who are receiving haemodialysis. Intradialytic exercise is an ‘umbrella’ term which comprises any type of exercise programme delivered during haemodialysis treatment.⁸ In practice it is typically delivered by means of a bespoke static exercise bike, but can also incorporate resistance training, or a combination of aerobic and resistance training. Recent systematic reviews suggest that aerobic and resistance programmes, delivered in isolation, can improve field tests of exercise capacity,^{8,9} but combined training may impart a greater range of benefits, including increased exercise capacity, quality of life and reductions in levels of depression.⁷ Based on current available evidence, the Renal Association Haemodialysis Guidance recommends that intradialytic exercise should be available in all units, to enhance physical functioning.¹⁰

7.2 OCCUPATIONAL THERAPY

Occupational therapists are specialists in enabling people to achieve or maintain optimum functional levels for daily activities (occupations) by modifying the physical and social environment to overcome impairments.¹¹ Through the provision of self-management strategies and employing enabling approaches occupational therapists can help people to take control of their own health and wellbeing across all stages of their disease.¹²

NICE guidelines recommend regular occupational therapy sessions to improve and maintain the overall health and well-being of people.¹³ It has been identified that increasing physical and functional activities can lead to increased life expectancy, reduce the risk of depression and dementia, reduce falls risk, maintain independence and engagement in social activities for the general population.¹⁴

Occupational therapy intervention and rehabilitation for people living with CKD is tailored towards minimising the implications of multiple and constantly changing symptoms on occupational performance and wellbeing; consequently, it is pivotal for their management to anticipate functional problems and proactively manage the needs of the individual. People living with kidney disease can experience very rapid changes in their illness, in their treatment planning requirements and care settings. Proactive and timely access, continual monitoring and re-assessment by occupational therapy is essential throughout the patient pathway ensuring a flexible and timely response to these fluctuating needs. Consideration of the needs of informal and formal carers are also implicit to occupational therapy care planning.

Occupational therapists support people to remain at home and aim to reduce admissions and are therefore ideally placed to contribute significantly to improving the health and well-being of those with long term conditions such as CKD which in turn impacts on health and social care costs. The Royal College of Occupational Therapists have reported that by having occupational therapists on acute medical wards, length of stay can be cut from 9.5 days to one day.^{11,15}

Investment in occupational therapy is directly linked with improving patient experience, quality of life and efficiency of working. The Royal College of Physicians in their stroke guidelines 2016¹⁶ and the Faculty of Intensive Care Medicine 2015¹⁷ both recommend patients receive at least 45 minutes of occupational therapy input five days a week for adequate rehabilitation.

7.3 CLINICAL EXERCISE PHYSIOLOGISTS

The role of the clinical exercise physiologist is to advance the application of clinical exercise physiology to improve the health, fitness and quality of life for people who are at risk of developing, or who have already developed a chronic disease.^{5,18} Clinical exercise physiologists are appropriately trained and qualified exercise professionals who may be included in the clinical renal MPT, to assist with the development and delivery of effective exercise training interventions/services and to support the sustainability of physical activity behaviour change^{19,20} across the range of in-centre, outpatient, community and home-based settings.⁵ Long term engagement in physical activity is important for patients with CKD to enhance their quality of life and physical function whilst reducing cardiovascular disease risk factors and other comorbidities which may then decrease the risk of secondary diseases, such as cardiovascular disease and heart failure.²¹

Trained clinical exercise physiologists working as part of the MPT can prescribe, deliver and monitor physical activity programmes to provide referral pathways for physical activity as part of NHS services, in the community or external services. Multimodal exercise should be provided to maintain or improve functional capacity, aerobic capacity, body composition and quality of life through personalised exercise programmes or group exercise to enhance social interaction. These exercise approaches are recommended by the BASES expert statement on exercise therapy for people with CKD.⁵

Renal rehabilitation services should include clinical exercise physiologists alongside physiotherapists to support the development and evaluation of individualised, effective and sustainable physical activity and exercise plans. The role of these individuals and their activities, will be central to the transition from acute rehabilitation services towards community-based pre-dialysis (stages 2-4) and post-transplantation services (akin to Phase IV cardiac rehabilitation) involving, where appropriate, self-managed physical activity plans to support sustained participation.⁵

Referral networks should be formed between healthcare professionals, such as physiotherapists, and appropriately trained clinical exercise physiologists to develop integrated referral pathways to exercise in the community in order to enhance access to long term safe and effective exercise services. Clinical exercise physiologists holding additional qualifications such as the BASES Certified Exercise Practitioner status, British Association for Cardiovascular Prevention and Rehabilitation (BACPR) cardiac phase IV exercise specialist certification,¹⁸ or the American College of Sports Medicine clinical exercise physiologist certification, are able to manage the transition and implement community exercise services that are responsive to the changing needs of all people with CKD.

TABLE 1. COMPONENTS OF THE RENAL THERAPY SERVICE.

Role of specialist renal physiotherapist
<ul style="list-style-type: none"> • Assessment of mobility, physical function, balance, exercise capacity, muscle strength and the impact of renal-related symptoms • Developing, prescribing and monitoring treatment plans for physical activity, exercise or holistic rehabilitation based on individual need • Work with renal dietitians in MPT-led weight management clinics • Staff education on physical activity and exercise training for people living with chronic kidney disease • Development of educational materials and provision of education on physical activity and exercise training for patients with chronic kidney disease • Audit and research <p>Inpatient specific roles:</p> <ul style="list-style-type: none"> • Comprehensive individualised assessment and treatment to enhance mobility and function, and facilitate safe and effective discharge planning • Referral to inpatient rehabilitation centres if applicable • Identify participants suitable for renal rehabilitation outpatient services and other community-based rehabilitation or support services <p>Outpatient specific roles:</p> <ul style="list-style-type: none"> • Renal rehabilitation including physical function and exercise capacity assessment • Exercise prescription through renal rehabilitation classes or home programmes • Patient engagement with exercise therapy and physical activity interventions through use of behaviour change techniques such as motivational interviewing • Working closely with dietitian colleagues for renal specific weight management MPT-led clinics (to include assessment, prescription of physical activity and progression of treatment plan) • Physiotherapy assessment, prescription of exercise and physical activity interventions for people receiving care in post-transplant • Assessment, exercise prescription and progression of exercise training plan for intradialytic exercise
Role of the renal physiotherapy assistant
<ul style="list-style-type: none"> • Assist in assessment of people living with kidney disease • Implementation of physiotherapy intervention plans for balance, mobility and exercise rehabilitation • Assist in data collection and audit • Assist with intradialytic exercise programme delivery
Role of the specialist renal occupational therapist
<ul style="list-style-type: none"> • Assessment and interventions for people experiencing difficulties performing meaningful occupations e.g. personal care, meal preparation, vocational roles • Recommendations for adaptations to home environment • Provision of manual handling or adaptive equipment • Seating and postural assessments • Supporting optimal end of life care • Cognitive assessments and stimulation • Onwards referrals for rehabilitation and supportive care • Audits and research <p>Outpatient specific interventions:</p> <ul style="list-style-type: none"> • Assessment for transport needs • Vocational rehabilitation • Application of fatigue and sleep management strategies • Energy conservation education and techniques • Anxiety management – coping strategies • Relaxation sessions • Baseline cognitive and functional assessments • Support tolerance of dialysis treatment e.g. positioning, relaxation/distraction • Supporting home dialysis through environmental assessments and task analysis • Promotion of meaningful occupations (losing ~12 hours per week on dialysis) • Upper limb rehabilitation • Facilitation of education and group therapy sessions
Role of the clinical exercise physiologist
<ul style="list-style-type: none"> • Assessment and interpretation of physiological impairment, functional limitations, and functional status • Assessment and interpretation of physical activity behaviours • Physical activity behaviour change counselling • Production of educational materials on exercise; planning, development, implementation and monitoring of safe and sustainable physical activity and exercise plans, based on individualised assessment and needs in a community setting • Facilitating safe and effective evidence-based community exercise prescription and advice • Agreeing and implementing supervised or unsupervised renal rehabilitation classes or home-based physical activity programmes

7.4 THERAPY STAFFING LEVELS

Physiotherapy

A 2014 exercise counselling survey conducted on behalf of the British Renal Society (BRS) Rehabilitation Network highlighted a shortage of knowledgeable exercise professionals such as physiotherapists, lack of funding and lack of time for rehabilitation as the main barriers to implementing physical activity and exercise counselling within UK renal units.²² There is a need for an increase in physiotherapy service and capacity to address this. The BRS Rehabilitation Network has reviewed the physiotherapy workforce requirements and produced the current recommendations based on requirements for physiotherapy staff in both the inpatient, and outpatient, renal settings. The skill levels described are outlined in detail within Table 4 at the end of this chapter (page 59).

Inpatient physiotherapy service

We suggest each 25-bed inpatient ward should have at least 1.0 WTE specialist renal physiotherapist at minimum skill level six (see skills for health Table 4 at the end of this chapter) and 1.0 WTE physiotherapy assistant at a minimum skills level 3. This will ensure timely and comprehensive assessments and inpatient rehabilitation, resulting in efficient discharge planning and positively influencing both length of stay and patient outcomes. Staffing levels may vary depending on the number of beds, patient complexity and acuity (for example, high dependency beds which may require a further increase in staffing levels).

Outpatient physiotherapy services

Physiotherapy-led renal rehabilitation classes

These outpatient classes are suitable for people across the CKD trajectory and are offered in either a hospital, or community setting. The classes offer individualised exercise assessment, prescription and progression of exercise training plans. Renal rehabilitation is modeled on pulmonary and cardiac rehabilitation, where exercise is combined with disease-specific education. The UK Pulmonary Rehabilitation guidelines recommend one staff member per eight patients in an exercise class, and one staff member per six patients for education sessions. It is suggested that staffing levels also allow for annual leave, training, sickness and maternity leave.²³ Cardiac rehabilitation guidelines suggest two specialist physiotherapy staff members (AfC band 6-7) per 500 patients.^{24,25} Based on these guidelines, and evidence from existing NHS-commissioned renal rehabilitation services²⁶ the BRS Rehabilitation Network recommends one specialist renal physiotherapist (skill level 6-7), and one physiotherapy assistant/non-qualified member (skill level 3-4) of staff per class of 12 patients.

Physiotherapy renal transplant clinics

Physiotherapy-led renal transplant clinics are provided as part of the care delivered by the wider renal transplant team. In this setting, specialist renal physiotherapists (skill levels 7-8) assess and prescribe post-surgical exercise, physical activity and lifestyle interventions for people who have received a kidney transplant, and review these on an annual basis. The Cystic Fibrosis UK standards for clinical care recommend patients are reviewed by specialist physiotherapists in an outpatient clinic on annual basis.²⁷ Therefore, the BRS Rehabilitation Network recommends that a specialist renal physiotherapist (skill level 7-8) is present during all renal transplant clinics.

Renal weight management clinics

These clinics are delivered jointly by a renal specialist dietitian and a renal specialist renal physiotherapist (skill level 7-8) in an outpatient setting. Patients are seen on an individual basis monthly for six months, and three-monthly after this.^{3,28,29} For successful weight loss treatment that initiates changes to both food and physical activity behaviours, specific skill sets are required for renal therapies staff.

Intradialytic exercise

Intradialytic exercise programmes are delivered during haemodialysis treatment. Various formats may be implemented, including aerobic only training (typically delivered by means of a bespoke static exercise bike), strength training, or a combination of both.^{8,9} Programmes may also include exercise counselling and behaviour change support to increase physical activity outside of the haemodialysis unit.¹⁰ Given the range of programmes available, a variety of staffing models may be utilised, with more input potentially required for combination training programmes. All types of programme should be supervised by an appropriately trained individual.¹⁰ The level and type of support required will also be dependent upon the size of the unit and the level of patient dependency.

The optimum length of programme is currently unknown, but available guidance suggests that programmes of at least 4 months duration, which progressively increase exercise volume from at least 30 minutes, and are available at least three times per week, will confer benefit.¹⁰ Where intradialytic exercise is delivered by physiotherapists, the programme should be overseen, and new patients assessed, by a specialist physiotherapist (skill level 6-7), with support from a therapy assistant (level 3-4) to provide the intervention and progress the programme as directed by the qualified therapist.

Based on existing NHS-commissioned renal physiotherapy services, the BRS Rehabilitation Network suggest a minimum provision of 1.0 WTE skill level 7-8 and 1.0 WTE level 6 physiotherapists and 1.0 WTE skill level 4 therapy assistant, to allow for delivery of:

- Four renal rehabilitation classes per week;
- Six new renal rehabilitation patient assessments per week;
- Provision for oversight and implementation of two sessions (Monday to Friday) of intradialytic (based on programme which comprises aerobic training delivered by means of a static exercise bike) (up to 120 patient contacts). This estimate is based on two 12 bedded dialysis units;
- 1x 0.5 day renal weight management clinic per week;
- 3x 0.5 day renal transplant clinics.

Occupational therapy

In 2018, A survey was conducted to assess the renal occupational therapy services across the UK units. Out of the 86 hub units in the UK; 19 had access to renal-specific occupational therapy, 47 had access to generic occupational therapy, 8 had no access to occupational therapy and 12 hub units were uncontactable.³⁰ Staffing levels from the survey are presented in Table 2 below.

TABLE 2. RENAL OCCUPATIONAL THERAPY WORK FORCE IN THE UK.³⁰

Grade of OT	WTE	Percent
Band 7 – Senior specialist OT	4.5	16.73
Band 6 – Senior OT	12	44.61
Band 5 – OT	6	22.3
Band 4 – OTA	1	3.72
Band 3 – OTA	3	11.15
Band 2 – OTA	0.4	1.49

OT, Occupational Therapist; OTA, Occupational Therapy Assistant

For an inpatient setting, we suggest that every unit should have access to specialist renal occupational therapists to ensure people living with kidney disease receive interventions tailored to their specific needs. We suggest minimum staffing of 1.0 WTE registered occupational therapist minimum level 6-7 per 27 bed wards and 0.5 WTE minimum level 4. This will ensure adequate staffing to allow the provision of effective rehabilitation. The skill levels described are outlined in detail within Table 3 at the end of this chapter (page 59).

For outpatient services, we suggest minimum staffing of 1.0 WTE registered occupational therapist minimum level 6 and 0.5 WTE minimum level 3 occupational therapist assistant. Numbers will vary depending on size of unit and additional services offered. This staffing level will allow occupational therapists to support with symptom management and provide interventions on the dialysis unit and in outpatient clinics.

Clinical exercise physiologists

Lack of funding and staff time may be the main barriers to implementing physical activity and exercise counselling in UK renal units and clinical exercise physiologists can support physiotherapy services to address this. Trained clinical exercise physiologists can design, agree, review and monitor physical activity programmes as part of community-delivered exercise programmes. The BRS Rehabilitation Network recommends renal physiotherapists and occupational therapists liaise with local trained clinical exercise physiologists to develop and maintain coherent exercise referral pathways. This will ensure that all patients have access to individualised and monitored exercise prescriptions relating to their care.

TABLE 3. SKILLS FOR HEALTH CAREER FRAMEWORK FOR PHYSIOTHERAPY AND OCCUPATIONAL THERAPY³¹

Level	Explanation	Physiotherapy	Occupational therapy
8	<ul style="list-style-type: none"> Require highly specialised knowledge, some of which is at the forefront of knowledge in a field of work Leaders with considerable responsibility, and the ability to research and analyse complex processes Have responsibility for service improvement or development May have considerable clinical and/or management responsibilities, be accountable for service delivery or have a leading education or commissioning role 	<p>Equivalent to consultant physiotherapist Renal-specific skills in this area include leading:</p> <ul style="list-style-type: none"> Specialist renal therapy team Research in renal rehabilitation Service development and improvement and education at a local and national level Directing and contributing to policy and commissioning in relation to renal therapy interventions. 	<p>Clinical specialist - consultant occupational therapist</p> <ul style="list-style-type: none"> Advanced use of screening and assessment tools, goal-setting and psychological interventions to facilitate occupational engagement and meaningful activity Uses complex clinical reasoning and dual training across physical and mental health to facilitate highly specialist, innovative interventions Harnesses knowledge to drive service development Leads on renal-specific training and development Active in professional networks and national service development Actively engages in quality improvement (QI) and research
7	<ul style="list-style-type: none"> Have a critical awareness of knowledge issues in the field and at the interface between different fields They are innovative and have a responsibility for developing and changing practice and/or services in a complex and unpredictable environment 	<p>Advanced practitioner/highly specialised renal physiotherapist Renal-specific skills in this area include:</p> <ul style="list-style-type: none"> Highly specialised assessment and management and treatment of patients across the CKD trajectory including specialised outpatient therapy clinics e.g. weight and symptom management Highly specialised skills in behaviour change techniques Significant contribution to research, service delivery and management Leading a team of specialist renal therapists 	<p>Senior specialist occupational therapist</p> <ul style="list-style-type: none"> Advanced use of screening and assessment tools, goal-setting and psychological interventions to facilitate occupational engagement and meaningful activity Uses highly specialist clinical reasoning and dual training to facilitate highly specialist interventions Uses theoretical and practical knowledge to implement service development and QI Actively involved in training and development Takes clinical and operational responsibility for the specialist work of their team Involved in professional networks and national service development
6	<ul style="list-style-type: none"> Require a critical understanding of detailed theoretical and practical knowledge Specialists and/or have management and leadership responsibilities Demonstrate initiative and are creative in finding solutions to problems Some responsibility for team performance and service development and they consistently undertake self-development 	<p>Specialist/senior renal physiotherapist</p> <ul style="list-style-type: none"> Specialist renal assessment and treatment skills including rehabilitation, individualised exercise prescription, mobility progression, symptom management, cognitive strategies and behaviour change techniques Prioritise work efficiently taking into account clinical and service priorities Advise, guide and teach assistant, junior staff, assessment and management of patients Significant contribution to research and service development 	<p>Specialist occupational therapist</p> <ul style="list-style-type: none"> Competent using clinical reasoning and dual training across physical and mental health to facilitate delivery of specialist interventions Engagement in service development and QI projects with support Awareness of professional networks and context of national policies Use of screening and assessment tools, goal-setting and psychological interventions to facilitate occupational engagement and meaningful activity
5	<ul style="list-style-type: none"> Have a comprehensive, specialised, factual and theoretical knowledge within a field of work and an awareness of the boundaries of that knowledge 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 	<p>Basic grade/junior physiotherapist</p> <ul style="list-style-type: none"> Knowledge and skills to complete renal assessments and treatment May require assistance from senior staff for more complex patient management Assist in research and service development projects Advise, guide and teach assistant, junior staff, assessment and management of patients 	<p>Occupational therapist</p> <ul style="list-style-type: none"> Uses standard screening and assessment tools and goal-setting to facilitate occupational engagement and meaningful activity Uses basic clinical reasoning and dual training across to facilitate delivery of interventions with support Support seniors with service development and QI Manages a designated workload within scope of practice with support Contributes to discussion about professional practice
4	<ul style="list-style-type: none"> 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 May have responsibility for supervision of some staff 	<p>Therapy technical instructor (experienced)</p> <ul style="list-style-type: none"> Knowledge and skills to complete renal assessments and treatment in straightforward circumstances Requires assistance from senior OT/PT for more complex patient management Advise, guide and teach assistants and students Assisting in research and service development 	
3	<ul style="list-style-type: none"> Require knowledge of facts, principles, processes and general concepts in a field of work 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 Contribute to service development and are responsible for self-development 	<p>Therapy technical instructor</p> <ul style="list-style-type: none"> Able to complete basic renal rehabilitation assessments Administration Assisting with patients requiring the assistance of two therapists for rehabilitation (inpatient services) Providing exercises and therapy interventions (including relaxation and meaningful activities) from PT and OT plans 	
2	<ul style="list-style-type: none"> Require basic factual knowledge of a field of work Carry out clinical, and administrative duties according to established protocols 	<p>Therapy assistant</p> <ul style="list-style-type: none"> Able to complete basic renal rehabilitation assessment with supervision Liaison and booking more complex patients with a PT/OT Providing interventions from PT/OT plans Assisting with patients requiring the assistance of two therapists for rehabilitation 	

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The authors of this chapter wish to acknowledge the contributions of:

Lyndsey Abdunnassir
 Sharlene Greenwood
 Jo Hamilton
 Heather Mackinnon
 Vicky Pursey
 Hannah Young