

Nephrological physiotherapy: A new approach towards patients with chronic kidney disease undergoing hemodialysis

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Editorial

Over recent years, the concept of renal rehabilitation has steadily gained acceptance and recognition within numerous medical and allied health specialties. Practitioners such as nephrologists, dialysis and transplantation experts, rehabilitation professionals, nutritionists, nursing staff, physiotherapists, clinical guideline developers, and patient representatives have collectively contributed to expanding awareness and understanding of this vital intervention [1]. Given its emergent importance, it becomes essential to articulate a clear, unified definition of renal rehabilitation, explore standardized methodologies for its implementation, and rigorously evaluate its effectiveness through evidence-based studies [2]. This report aims to synthesize the current body of knowledge into best practice recommendations that optimize the quality, safety, efficacy, and availability of renal rehabilitation services. The ultimate goal is to provide holistic care that enhances patient health outcomes, improves quality of life, and fosters greater satisfaction with treatment [3].

Nephrological Physiotherapy

Nephrological physiotherapy, interchangeably known as renal rehabilitation, is a comprehensive, multidisciplinary approach centered on improving the physical and psychosocial well-being of people living with chronic kidney disease (CKD) [4]. This specialized therapy integrates physical exercises alongside additional modalities to improve cardiovascular health, augment muscular strength, increase endurance, and alleviate fatigue, which are commonly compromised in CKD patients. The program targets the reversal or mitigation of muscle wasting, physical deconditioning, and the psychological burdens identified with progressive kidney disease. The extensive nature of this intervention ensures that not only the physical but also the emotional and social dimensions of patients' lives are addressed [5].

Goals of Nephrological Physiotherapy

- **Enhance physical function:** Physiotherapeutic interventions aim specifically to combat reductions in exercise capacity, muscle atrophy, and activity-related fatigue commonly experienced by CKD patients.
- **Elevate quality of life:** Through physical and psychological support, patients often experience improvements in mental health, reduced depression and anxiety, and greater participation in meaningful daily activities.
- **Manage comorbidities effectively:** The programs assist in stabilizing blood pressure and reducing the incidence of cardiovascular complications such as heart failure, which are prevalent in CKD populations.

- **Promote autonomy and independence:** Enhanced physical capacity allows patients to regain control over their activities of daily living, thus fostering self-reliance and social engagement.

Components of Renal Rehabilitation

Exercise training: Structured, supervised exercise regimens including aerobic activities like walking or cycling form the cornerstone of renal rehabilitation, enhancing oxygen utilization and strengthening key muscle groups.

Nutritional support: Dedicated nutritional plans are developed to ensure appropriate caloric intake and optimal protein and micronutrient balance, preventing the muscle breakdown commonly associated with CKD.

Medical surveillance: Continuous monitoring of patients' clinical status, including comorbid conditions, medication regimens, and overall health, is critical to tailor rehabilitation safely and effectively.

Patient education: Empowering patients with detailed information and practical self-management strategies fosters engagement and adherence to the rehabilitation plan.

Psychological support: Addressing mental health challenges through counselling and support groups helps to reduce disease-related stress and improve rehabilitation outcomes.

Benefits and Effectiveness

Clinical evidence supports that renal rehabilitation leads to significant improvements in exercise tolerance, allowing patients to engage in physical activity with less effort and fatigue. Positive effects on quality of life include enhanced mood, reduced symptoms of depression, and better overall mental health. Physiotherapy interventions lead to measurable gains in cardiorespiratory fitness and muscular strength, contributing to prolonged independence and reduced hospitalization rates. Importantly, renal rehabilitation is considered both a safe and a feasible secondary prevention strategy, effectively complementing medical management of CKD.

Challenges and the Role of the Physiotherapist

One of the key challenges in CKD management is combating the deconditioning cycle precipitated by physical inactivity and disease progression, which physiotherapy aims to break. Another critical issue is sarcopenia, a progressive loss of skeletal muscle mass and function driven by metabolic imbalances such as uremic acidosis, chronic inflammation, and nutritional deficits. These factors collectively heighten the risk of frailty, disability, and poor clinical outcomes.

Physiotherapists play a pivotal role within the multidisciplinary care team dedicated to managing CKD. They are responsible for designing and implementing personalized exercise regimens that cater specifically to each patient's unique physical and functional needs, thus enabling patients to reach their rehabilitation objectives [6]. These objectives are pursued through carefully crafted physiotherapy programs that emphasize consistent and regular physical activity tailored to the individual's health status and capabilities [7]. Renal rehabilitation programs are inclusive and beneficial for patients across all stages of CKD. However, they are most commonly applied to individuals undergoing renal replacement therapies, including both hemodialysis and peritoneal

dialysis [8]. Additionally, physiotherapy-driven rehabilitation holds particular significance for patients awaiting kidney transplantation; an enhanced level of physical fitness prior to transplantation has been shown to substantially improve outcomes, including better patient survival rates and increased longevity of the transplanted organ [9].

Indications for Hemodialysis Patients in Physical Training Programs

Patients who meet the following criteria may safely participate in physical training programs during hemodialysis:

- Having undergone stable dialysis treatment for a minimum of three months.
- Demonstrating cardiovascular stability based on clinical assessment.
- Maintaining blood glucose levels within the range of 100 to 300 mg/dL.
- Absence of any medical contraindications preventing exercise.
- Exhibiting motivation and willingness to engage in physical activities.

Contraindications for Hemodialysis Patients in Physical Training Programs

Physical training may not be appropriate for hemodialysis patients if they present any of the following:

- Severe physical limitations that impede safe participation in exercise.
- Mental health disorders or cognitive impairment interfering with exercise cooperation.
- Presence of acute symptoms such as dizziness, chest pain, unexplained abdominal pain, nausea, vomiting, unexplained fatigue, or confusion requiring medical evaluation.
- Active infection or fever exceeding 38°C; recent myocardial infarction within the last eight weeks; unresolved chest pain.
- Medical instability manifested as uncontrolled hypertension (systolic >200 mmHg or diastolic >110 mmHg), difficult-to-manage arrhythmias, or resting angina.
- Serious cardiac conditions including, but not limited to, severe valvular heart disease, hypertrophic cardiomyopathy, myocarditis, pericarditis, and pulmonary hypertension.
- Poorly controlled diabetes with hyperglycemia complicated by ketosis or hypoglycemia episodes in insulin-treated patients.
- Advanced complications such as severe osteodystrophy or retinopathy.
- Electrolyte imbalances like hyperkalemia (potassium >6 mmol/L).
- Issues with vascular access necessary for dialysis (e.g., malfunctioning fistulas or catheters).
- Hemodynamic instability during dialysis sessions, such as hypotension or excessive interdialytic fluid gains.
- New or unexplained neurological deficits, including limb weakness or speech difficulties [2,10].

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