



The RPSG

The Renal Patient Support Group

Physical Activity & Renal Health

Physical Activity

- Muscle strength, uraemia, dialysis complications, and activity levels of CKD patients are conventionally lower (Zhang et al. 2019).
- Further deteriorating of basic activities of daily living and can increase all-cause mortality (Zhang et al. 2019).
- Moderate-intensity physical activity provides cardiovascular protection and metabolic benefits (Zhang et al. 2019).
- Most patients on HD are prone to CVD (Zhang et al. 2019).



Zhang, L., Wang, Y., Xiong, L., Luo, Y., Huang, Z., Yi, B. (2019). Exercise therapy improves eGFR, and reduces blood pressure and BMI in non-dialysis CKD patients: evidence from a meta-analysis, BMC Nephrology, 20, 1-12

Physical Activity

- Patients in Renal Failure have seriously reduced physical capacity and they have a high risk of CVD (Qiu et al. 2017).
- Physical activity should be considered as prevention and rehabilitation (Qiu et al. 2017).
- Physical activity program is suggested to help in making patients' life quality better (Zhang et al. 2019).



- Qiu, Z., Zheng, K., Zhang, H., et al. (2017). Physical Exercise and Patients with Chronic Renal Failure: A Meta-Analysis, Biomed Res Int.
- Zhang, L., Wang, Y., Xiong, L., Luo, Y., Huang, Z., Yi, B. (2019). Exercise therapy improves eGFR, and reduces blood pressure and BMI in non-dialysis CKD patients: evidence from a meta-analysis, BMC Nephrology, 20, 1-12.

Advantages of Physical Activity

- Physical Activity could increase eGFR by 2.62ml/min/1.73m² in non-dialysis CKD patients (Zhang et al. 2019).

Exercise therapy could improve

- Endothelium-mediated vasodilatation
- Increases sympathetic nervous system activity
- Reduces urinary protein
- Improves renal blood flow and residual renal function in non-dialysis CKD patients by decreasing BP, blood lipids and BMI, and thereby delaying renal function deterioration (Zhang et al. 2019)
- Better control of diabetes
- Improves health-related quality of life as a result of enhanced well-being and improved physical functioning (Johansen 2007).

- Zhang, L., Wang, Y., Xiong, L., Luo, Y., Huang, Z., Yi, B. (2019). Exercise therapy improves eGFR, and reduces blood pressure and BMI in non-dialysis CKD patients: evidence from a meta-analysis, *BMC Nephrology*, 20, 1-12
- Johansen, K.L. (2007). Exercise in the End-Stage Renal Disease Population, *J Am Soc Nephrol*, 18, 1845-1854



Risk Factors of Decreased Physical Activity

Decreased physical activity in non-dialysis CKD patients (including kidney transplant recipients) is associated with:

- Increases Mortality
- Adverse Clinical Events,
- Impaired Renal Function,
- Increases probability of renal insufficiency
- Reduced of renal allograft survival rate



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Physical Activity & Haemodialysis Patients

- Physical activity is related to improved physical capacity and helping in the control of chronic diseases, including kidney disease (Qiu et al. 2017).
- Studies show that physical fitness level of haemodialysis patients tends to improve function levels (Qiu et al. 2017).
- Physical activity is an important intervention for patients on HD in improving physical performance (Qiu et al. 2017).
- Physical activity will improve body function and physical capacity, which will benefit patients on HD and help blood pressure control and oxygen flow (Qiu et al. 2017).



Qiu, Z., Zheng, K., Zhang, H., et al. (2017). Physical Exercise and Patients with Chronic Renal Failure: A Meta-Analysis, *Biomed Res Int.*, 2017, 1-8.

Low Levels of Physical Activity

- Low level of physical activity would be expected to be associated with malnutrition, inflammation, and disease, making a typical association between sedentary behaviour and higher mortality (Johansen 2007).
- Low physical activity capacity, muscle wasting, and poor physical performance are highly prevalent among patients with ESRD and potentially modifiable with physical activity interventions (Johansen 2007).
- Low level of physical activity is associated with development of disability, loss of independence, and death among elderly community (Johansen 2007).



Physical Activity & Inactivity

- Dialysis patients are extremely inactive. Nephrologists rarely assess patients' physical activity levels or counsel patients to increase activity (Johansen 2007).
- The lack of exercise assessment and counselling is multifactorial, related to such factors as competing medical issues that lead to limited time available for exercise counselling, lack of training in exercise prescription, and fear of adverse events related to exercise in CKD population (Johansen 2007).



Johansen, K.L. (2007). Exercise in the End-Stage Renal Disease Population, *J Am Soc Nephrol*, 18, 1845-1854

Physical Activity Risks

- The most common risk during exercise, is musculoskeletal injury (Johansen 2007).
- The risk of adverse events is higher with high-intensity exercise than with sub-maximal exercise (Johansen 2007).
- Musculoskeletal risks may be increased in CKD patients with as a result of hyperparathyroidism and bone disease (Johansen 2007).



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Strength Training

- Weight—bearing of strengthening exercise could decrease the risks of falls and increase bone density, reducing risk of fracture (Johansen 2007).
- The risk for injury can also be minimised by including a warm-up period in exercise sessions, by avoiding high-impact activities (Johansen 2007).
- Beginning training programmes at lower intensity and progressing gradually as tolerated (Johansen 2007).



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Physical Activity Investigation

- Medical screening before exercise participation can help determine which patients are at increased risk for CVD events (Johansen 2007).
- Testing should be related to the proposed intensity of training and patient's symptom or disease status (Johansen 2007).
- Patients with diagnosed cardiac disease should undergo exercise testing before participation in vigorous training programmes (Johansen 2007).



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Assessing Physical Activity

- Musculoskeletal limitations can be further assessed through referral to a physical therapist (Johansen 2007).
- Cardiovascular symptoms warrant dry weight assessment and/or stress testing (Johansen 2007).



Johansen, K.L. (2007). Exercise in the End-Stage Renal Disease Population, J Am Soc Nephrol, 18, 1845-1854.

Guidelines on Physical Activity

- Published Kidney Disease Outcomes Quality Initiative (K/DOQI) clinical practice guidelines on management of cardiovascular disease state that, *“all dialysis patients should be counselled and routinely encouraged by nephrology and dialysis staff to increase level of physical activity”* (Johansen 2007).
- Existing guidelines provide little assistance in determining whether physical activity testing should be performed before starting (Johansen 2007).



Johansen, K.L. (2007). Exercise in the End-Stage Renal Disease Population, *J Am Soc Nephrol*, 18, 1845-1854.

Steps to Increasing Physical Activity

- Teams should determine whether patients can perform at least 30 mins of moderate activity on three or more days per week (Johansen 2007).
- If patients are not active, it is important to investigate the barriers, including specific questions about musculoskeletal limitations and potential cardiac limitations such as dyspnoea or chest pain (Johansen 2007).



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Summary on Physical Activity

- Physical activity programmes within a dialysis setting have the potential to be of great benefit (Johansen 2007).
- It is impractical to consider a programme without universal support of health professional, because the burden of maintaining an in-centre physical activity can cause an imposition (Johansen 2007).
- Physical activity is one strategy to improve eGFR, reduce blood pressure (BP) and BMI in non-dialysis CKD patients (Zhang et al. 2019).
- Physical activity can prompt social advantages (Zhang et al. 2019).



- Zhang, L., Wang, Y., Xiong, L., Luo, Y., Huang, Z., Yi, B. (2019). Exercise therapy improves eGFR, and reduces blood pressure and BMI in non-dialysis CKD patients: evidence from a meta-analysis, BMC Nephrology, 20, 1-12.
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