

# Exercise in advanced chronic kidney disease patients: risk or gain?

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**This editorial refers to ‘The role of exercise training on cardiovascular risk factors and heart disease in patients with chronic kidney disease G3–G5 and G5D: a Clinical Consensus Statement of the European Association of Preventive Cardiology of the ESC and the European Association of Rehabilitation in Chronic Kidney Disease’, by E. Kouidi et al., <https://doi.org/10.1093/eurjpc/zwae130>.**

Cardiovascular (CV) disease (CVD), sharing many common risk factors with chronic kidney disease (CKD), is a major contributor to reduced life expectancy in CKD patients, being CV risk exponentially related to renal function decline.<sup>1</sup>

Exercise training (ExT), and the broader spectrum CV rehabilitation (CVR), can contribute to CV and renal risk factors and disease management, but are rarely prescribed to patients with CKD, especially in more advanced stages. Frequently, the presence of old age, geriatric specificities, comorbidities like anaemia, muscle atrophy, hyperparathyroidism, vitamin D deficiency and osteoporosis, transform these patients into complex cases, difficult to be managed by only one specialist, requiring an integrated look and specific attention. A multidisciplinary and multicomponent approach is needed for these multimorbidity patients, including the nephrologist, together with the cardiologist and the exercise expert as a central core in the rehabilitation team. However, CVR centres are not used to deal with these cases, focusing more often in CV patients (coronary artery disease, heart failure, post-cardiovascular surgery) with less severe renal failure.

It is easy to understand that among cardiovascular rehabilitation components, the global and specific evaluation of patients, the nutritional and psychological interventions and the educational programme, can be accepted more easily, because they imply no risk and the benefits look clear. That is not the case with the exercise training component, which requires a rigorous risk and benefit evaluation and an adequate prescription, still involving some doubts and gaps. Large trials with CKD, G2–G5, real-world patients, including the elderly and those with multiple comorbidities, after initial studies with younger patients, confirmed the beneficial effects of exercise training and CVR in chronic renal function, physical capacity, and morbidity.<sup>2</sup> Despite these good results, exercise and comprehensive CVR are still scarcely used. At this point, to promote physical activity, exercise training, and CVR programmes, it is essential to identify some misbeliefs and to provide consensual recommendations for exercise in patients with CKD, specifically in advanced stages.

The present Clinical Consensus Statement of the European Association of Preventive Cardiology (EAPC) of the European Society of Cardiology (ESC) together with the European Association of Rehabilitation of Chronic Kidney disease (EURORECKD), entitled ‘The role of exercise training on cardiovascular risk factors and heart disease in patients with chronic kidney disease G3–G5 and G5D’,<sup>3</sup> elegantly structures and summarizes the available scientific evidence with regard to physical activity and ExT in patients with CKD. It highlights, based on current knowledge, that exercise training has the potential to reduce CV risk and disease in patients with CKD, supporting the relevance of exercise implementation in these patients and creating awareness among healthcare professionals. The statement that ‘any activity is better than no activity’ is simple but straight and easy to understand, since advanced CKD patients are generally very inactive and sedentary. As some present evidence suggests a dose–response association between physical activity and all-cause mortality, clinicians and other healthcare professionals should encourage patients with CKD to be as active as possible and to participate in individualized exercise programmes. The authors recommend exercise programmes to be tailored and integrated in everyday life, long lasting, which is considerably important, once specific training might not fit into individual daily life activities and adherence needs to be guaranteed, even if there is, in theory, a correct exercise prescription. It is highlighted, due to several existent barriers to exercise in these patients, the effectiveness of simple, self-administered home-based ET programmes on cardiovascular health with good results on physical function.<sup>2</sup>

This Consensus article<sup>3</sup> allows the understanding of the extent to which lifestyle behaviours, such as regular exercise habits, are of benefit for CV risk reduction and of key importance for the management of CKD patients. It also demonstrates the evidence from different studies that, against possible beliefs, ExT does not worsen proteinuria in patients with CKD Stages 3–5, and instead may reduce albuminuria, an important risk marker in these CKD G3–G5 patients, as high intensity exercise<sup>4</sup> or combined strength and aerobic training.<sup>2</sup>

Importantly, the benefits of intradialytic exercise are also shown, based on data including a large real-world HD population.<sup>5</sup> So, dialysis is consensually not a contraindication to exercise, as some might think. Prescriptions and contraindications of ExT for patients on maintenance dialysis with CVD have been comparable to those of patients with heart failure.

A significant proportion of CV mortality in these advanced CKD patients is the result of sudden cardiac death, mainly caused by complex

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ventricular arrhythmias and bradyarrhythmia, due to the increase in cardiac autonomic dysfunction, with CKD progression.<sup>6</sup> Endurance training has been proposed as a non-pharmacological approach<sup>3</sup> to improve cardiac autonomic function.

An important practical issue in this article,<sup>3</sup> which is still on debate, is how to best prescribe the 'Exercise treatment' for patients with CKD, CV risk factors, and comorbidities, ensuring safety. The recommendations for cardiac patients and tailored exercise prescription according to each patient's functional capacity and degree of frailty have been followed. Moderate-intensity physical activity, at least 150 min/week, or compatible to CV and physical tolerance<sup>7</sup> and 7000–10 000 steps/day have been proposed; however, in real practice, the daily step count in patients with CKD has been inferior to 5000 steps.<sup>8</sup> In clinical practice, as said before, many patients are elderly and frail, severely deconditioned, have multiple comorbidities, and are not able to achieve the exercise targets proposed. In reality, many times CKD patients are not able to follow the guidelines of WHO regarding physical activity improvement and sedentary time reduction.

When deciding on the type and intensity of ExT in the individual patient with CKD, it should be recommended to consider cardio-respiratory fitness, physical limitations, cognitive function, and risk of falls.<sup>7</sup> Physical functional assessment is essential to detect patients' functional limitations and needs, as well as to ensure patients' safety during exercise. Simple tests as the six-minute walk test (6MWT) and 1-minute sit-to-stand (STS) tests are pointed as useful in clinical practice for prescribing and monitoring ExT<sup>9</sup> and the Borg scale can self-monitor exercise intensity, enabling to adjust the intensity of the prescription and maintain a level of adequate exertion, both safe and effective.<sup>10</sup>

The selection of exercise modalities and prescription of optimal individualized training programmes are challenging. Exercise prescription should include endurance, based on the exercise test, but also resistance and balance, almost every day. It is necessary that patients complete clinical evaluation before performing exercise test, ideally by cardiopulmonary exercise test (CPET), frequently not possible or inconclusive, and in practice many times substituted by feasible 6MWT.

The inclusion of these patients in CVR programmes will improve adherence to exercise and lifestyle modification with consequent benefits, namely in CV risk factors control. So, awareness of the importance, feasibility, and safety of exercise and CVR programmes in these CKD advanced stages needs to be promoted among patients and healthcare professionals, namely general practitioners, who many times follow these patients along with the nephrologists. Implementation of CVR for patients with CKD must be increased and in those CVR programmes already existent, nephrologists need necessarily to be involved.

Many of the known barriers to participation of CV patients in exercise and CVR, such as multimorbidity, frailty and advanced age, are highly prevalent among people with CKD. Therefore, characterizing the pattern of CVR utilization of CKD patients could be useful to focus recommendations and tailor strategies to increase this CV very high-risk group participation in CVR. Also, given the fact that CV risk factors amenable to lifestyle modification contribute significantly to the burden of CV disease in CKD, and are managed by CVR, research and programme investments should target implementation of CVR and respective evaluation, to improve the attendance of eligible CKD patients to CVR programmes.

In summary, to improve implementation of CVR in these CKD patients, even in those with advanced renal dysfunction or in dialysis, with CVD or CV risk factors, we need to:

- Increase awareness of the benefits of CV rehabilitation in CKD patients with CVD and/or CV risk factors.

- Include nephrologists and generalists in the pathway and in the CV rehabilitation team.
- Increase referral to CV rehabilitation programmes of patients with CKD, even with comorbidities.
- Increase CV rehabilitation patients uptake, through improving motivation and education of patients and family.
- Increase adherence to the programmes, auditing results, re-evaluating programmes for non-adherence, and fitting them into daily individual reality.

There are now, as the Consensus document describe,<sup>3</sup> several studies showing the benefits of exercise in advanced CKD patients, but besides all these great benefits, multicomponent CV rehabilitation programmes, with multidisciplinary teams, can additionally achieve even a greater benefit, changing lifestyle and managing CV risk factors and comorbidities, through education, empowerment, and nutritional and psychological support together with a real-life tailored individual exercise prescription.

Clinicians and allied healthcare professionals need to be active, not only more multidisciplinary, but also interdisciplinary, in CV prevention and rehabilitation of these advanced CKD very high CV risk patients to improve prognosis and quality of life.

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## Data availability

The data underlying this article are available in the article.

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