

Cycling study transforms heart health of dialysis patients

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Cycling at moderate intensity during dialysis could drastically improve the heart health of patients with kidney failure and result in significant savings for the NHS, according to new research by the University of Leicester supported by the charity Kidney Research UK and National Institute for Health Research (NIHR) Leicester Biomedical Research Centre.

Patients in the CYCLE-HD study were offered 30 minutes of moderate intensity exercise on a specially adapted bicycle during their regular [dialysis](#) sessions. Dialysis can lead to long-term scarring of the heart, which can accumulate over time and lead to [heart failure](#). The study set out to examine whether exercise could reduce these side-effects.

After six months, participants' hearts were assessed with an MRI scan and compared with pre-trial imaging. Patients who had cycled showed improvements in several aspects of heart health—their hearts were more like a 'normal' size, they had less scarring, and there was less stiffness

of the major blood vessels.

Analysis of the study also demonstrated a saving in healthcare costs of more than £1,400 per patient which, when balanced against the cost of the exercise equipment, could result in significant savings for the NHS.

James Burton is a Professor of Renal Medicine and Honorary Consultant Nephrologist at the University Hospitals of Leicester NHS Trust, and was chief investigator on the study. He said:

"We know that being more active can help reduce the risk of heart disease, as well as helping to control weight, reduce blood pressure and cholesterol, and improve mental health.

"For all those reasons—but especially because the risk of heart disease is so high—keeping active is particularly important for people on dialysis. Unfortunately, by the time that someone has traveled to and from the dialysis unit, and spent four hours connected up to the dialysis machine, there's very little time to do anything else that day, and the reality is that this happens three times a week for most patients.

"The findings of this study offer significant improvements to the heart health of dialysis patients which may have a major impact on their outlook."

Lord Bethell, Minister for Innovation, said, "Keeping active has a range of health benefits—both physical and mental—and the importance of exercise has become increasingly apparent over recent months with its impact on COVID-19.

"We have long been aware of the impact of exercise on other diseases and this research by the University of Leicester is testament to the ways we're constantly looking to improve people's [health](#)—through better understanding of conditions, faster

diagnosis and improving treatment.

"Not only does this research show we can reduce the side effects of dialysis, but it could also mean a significant saving for the NHS."

Professor Jeremy Hughes, [kidney](#) doctor and chair of trustees at Kidney Research UK said, "We are delighted to have supported this fascinating study, which shows how exercising while on dialysis can have so many benefits. Cycling can keep patients active and help to pass the long periods of time they spend attached to their dialysis machines.

"However, this study demonstrates that this simple intervention keeps their hearts healthy and offsets the major [heart](#) risk associated with [kidney failure](#). We hope this research will lead to other studies examining how to roll it out to other dialysis units across the country."

Dialysis is a life-saving procedure for people living with kidney failure, removing waste products from the body. More than 24,000 patients in the UK typically undergo haemodialysis therapy three times a week at four hours each time.

A quarter of deaths among haemodialysis patients in the UK between 2009 and 2018 were as a result of cardiovascular disease, according to the UK Renal Registry.

Researchers will now examine the possibilities of a wider rollout of the scheme to benefit patients across the UK, and now forms part of The Renal Association's haemodialysis guidelines.

More information: Matthew P.M. Graham-Brown et al, A randomized controlled trial to investigate the effects of intra-dialytic cycling on left ventricular mass, *Kidney International* (2021). [DOI: 10.1016/j.kint.2021.02.027](#)

Provided by University of Leicester

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