



## Cycling Exercise During Hemodialysis Reduces Left Ventricular Mass

For hemodialysis (HD) patients, a 6-month progressive exercise intervention leads to significant reductions in left ventricular (LV) mass, according to results from a clinical trial in *Kidney International*.

The CYCLE-HD study included 130 patients receiving HD at three UK centers. In open-label, cluster-randomized fashion, patients were assigned to a structured intradialytic cycling (IDC) intervention or usual care. With the use of specially adapted cycle ergometers, patients in the intervention group performed supervised cycling three times weekly during dialysis sessions, targeting 30 minutes of continuous cycling at a rating of perceived exertion of 12 to 14. Ergometer resistance was adjusted as necessary for exercise progression.

The study was powered to detect a 15-g between-group difference in LV mass, measured with cardiac magnetic resonance (CMR). Myocardial fibrosis, aortic stiffness, physical functioning, quality of life, and ventricular arrhythmias were evaluated as secondary outcomes. One hundred one patients completed the study; the most common reasons for non-adherence were declining participation, feeling unwell, and pain. Intervention patients completed 71.7% of scheduled IDC sessions.

IDC was associated with an 11.1-g reduction in LV mass; the difference remained significant on sensitivity analysis. The data suggested improvement in LV ejection fraction in the IDC group, although the between-group difference was not significant. There was “overwhelming evidence” of reduction in CMR-measured aortic pulse-wave velocity and native T1 times but no change in interdialytic or predialysis blood pressures.

Physical functioning and quality of life were not significantly different between groups. No serious adverse events were attributed to the IDC intervention.

Cardiovascular disease accounts for 42% of deaths in maintenance HD patients. Exercise reduces many important cardiovascular risk factors in patients with end-stage kidney disease.

The CYCLE-HD results suggest that a 6-month program of cycling exercise during dialysis sessions can reduce LV mass in HD patients. The study intervention is “safe, deliverable and well tolerated.” The researchers conclude, “IDC improves the cardiovascular health of patients on maintenance hemodialysis” [Graham-Brown MPM, et al. A randomized controlled trial to investigate the effects of intra-dialytic cycling on left ventricular mass. *Kidney Int* 2021; 99:1478–1486. doi: 10.1016/j.kint.2021.02.027]. ■

## Mortality from Early Dialysis Withdrawal: Trends and Risk Factors

Early dialysis withdrawal consistently accounts for about one-third of early deaths in the year after dialysis initiation, concludes an Australian study in *Nephrology Dialysis Transplantation*.

The researchers analyzed data on 32,274 patients initiating dialysis in Australia between 2005 and 2018, drawn from the Australian and New Zealand Dialysis and Transplant Registry. Early deaths (within 12 months) from dialysis withdrawal attributed to psychosocial or medical reasons were analyzed, including trends over time and associated risk factors.

Overall, 11% of patients died within 12 months after dialysis initiation. Twenty-two percent of these early deaths were ascribed to early withdrawal due to medical reasons and 14% due to psychosocial reasons. The proportion of deaths from early withdrawal remained unchanged during the study period, with a range from 33% to 38% per year. However, incidence rates of early withdrawal-related mortality decreased from 5.3 per 100 person-years in 2006 to 3.1 per 100 in 2018.

In both categories of early withdrawal, risk factors for early mortality included older age, central venous catheter access, late referral, and cerebrovascular disease. Underweight and high socioeconomic status were risk factors for early psychosocial withdrawal, whereas peripheral

vascular disease, chronic lung disease, and cancer were risk factors for early medical withdrawal. Center-level factors were not associated with death related to early withdrawal.

Dialysis withdrawal is a major contributor to the high risk of death in the first year after dialysis initiation. International registry data have suggested upward trends in the proportion of deaths in incident dialysis patients attributed to early withdrawal.

These Australian data show no significant change in the percentage of early deaths from dialysis withdrawal over the past two decades. Early deaths from medical withdrawals exceed those from psychosocial withdrawals.

Similar risk factors apply to both types of early withdrawal-associated mortality. The researchers conclude: “Recognising the patient at-risk of early mortality attributed to dialysis withdrawal may better inform the shared decision-making process, empower patient-focused treatment choices, and facilitate advanced care planning” [Chen JHC, et al. Temporal changes and risk factors of death from early withdrawal within 12 months of dialysis initiation—A cohort study. *Nephrol Dial Transpl*, published online ahead of print June 27, 2021. doi: 10.1093/ndt/gfab207; <https://academic.oup.com/ndt/advance-article/doi/10.1093/ndt/gfab207/6310179>]. ■

## ESRD QIP Penalties Don't Lead to Improvements in Dialysis Center Care

Dialysis centers hit with financial penalties under the Centers for Medicare & Medicaid Services' (CMS) mandatory End-Stage Renal Disease Quality Incentive Program (ESRD QIP) do not show subsequent improvement in quality of care, concludes a study in *Annals of Internal Medicine*.

The study used publicly available Medicare data on 5830 dialysis centers from 2015 to 2018. In 2017, financial penalties (based on 2015 performance) were levied on 1109 centers, representing 19.0% of the total. Regression discontinuity models were used to evaluate the association between penalization and subsequent changes in dialysis center quality, based on data from 2017 and 2018. In addition to the 0 to 100 composite metric, individual factors contributing to the total performance score were analyzed.

Penalized centers were located in ZIP Codes with a higher average percentage of non-White race residents, 36.4% versus 31.2%, and with a lower median income, \$49,290 versus \$51,686. Chain-affiliated centers accounted for 84.0% of penalized centers versus 93.6% of non-penalized centers. More than one-half (52.2%) of penalized centers were in the South US Census region.

For penalized centers, total performance scores did not improve in subsequent years, with changes of just

0.4 point in 2017 and 0.3 point in 2018. The findings were unchanged by adjustment for dialysis center characteristics or on analysis of centers penalized for the first time in 2017. There were also no improvements in specific components of the total performance score.

The ESRD QIP was designed to address the wide variation in quality of care provided at US outpatient dialysis centers. However, the program has not undergone independent evaluation, and its effects on quality of dialysis care remain unknown.

The study shows little or no improvement in quality of care at dialysis centers receiving financial penalties under the ESRD QIP. The findings are consistent for centers with differing characteristics and across individual quality metrics. The investigators conclude: “These data suggest that CMS may consider changes to the program design as [it continues] to experiment with ways to improve the care of patients with ESRD” [Sheetz KH, et al. Changes in dialysis center quality associated with the End-Stage Renal Disease Quality Incentive Program: An observational study with a regression discontinuity design. *Ann Intern Med*, published online ahead of print June 1, 2021. doi: 10.7326/M20-6662; <https://www.acpjournals.org/doi/10.7326/M20-6662>]. ■

## Plasma KIM-1 Has Prognostic Value in Kidney Disease

Levels of plasma kidney injury molecule-1 (KIM-1) are associated with diagnoses, pathologic findings, and kidney failure risk in patients with a wide range of kidney disease diagnoses, according to a report in the *American Journal of Kidney Diseases*.

The analysis included participants in two prospective, observational cohort studies: 524 patients undergoing clinically indicated native kidney biopsy enrolled in the Boston Kidney Biopsy Cohort (BKBC) and 3800 patients with common types of chronic kidney disease (CKD) from the Chronic Renal Insufficiency Cohort

(CRIC) study. Baseline plasma KIM-1 levels were analyzed for association with subsequent kidney failure (defined as initiation of dialysis) and death.

In multivariable analyses of BKBC participants, higher plasma KIM-1 levels were associated with more severe acute tubular injury, tubulointerstitial inflammation, and more severe mesangial expansion. By diagnosis, plasma KIM-1 levels were higher in patients with diabetic nephropathy, glomerulopathies, and tubulointerstitial disease.

In BKBC, during a median follow-up of 5 years, 124