# PERSPECTIVE

# Heart failure management for dialysis patients

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**ABSTRACT**

End-Stage Kidney Disease (ESKD) and Heart Failure (HF) usually coexist; one condition lowers the prognosis of the other. Nearly 50% of dialysis patients' fatalities are caused by HF. There is a dearth of information addressing the management of HF in patients on dialysis, and the majority of the current evidence is observational, despite the fact that patients with ESKD comprise an exceedingly high-risk cohort. Similar to this, in clinical practice, guideline-directed medicinal therapy for HF is frequently reduced in dose or stopped in patients with ESKD who are receiving dialysis due to worries about tolerability and safety.

## INTRODUCTION

Chronic renal disease is present in almost half of people with Heart Failure (HF). Similarly, 36% of people with End-Stage Kidney Disease (ESKD) who need dialysis and up to 70% of people with Chronic Kidney Disease (CKD) have HF. Patients with both disorders have a significantly worse prognosis than those with just one of them. HF and other cardiovascular diseases are responsible for about 50% of mortality among dialysis patients. Patients with Heart Failure (HF) and a low ejection fraction have a lower mortality rate when taking beta-blockers, Angiotensin Receptor Neprilysin Inhibitors (ARNIs), Renin-Angiotensin-Aldosterone System (RAAS) inhibitors, Mineralocorticoid Receptor Antagonists (MRAs), and Sodium-Glucose Cotransporter-2 (SGLT2) inhibitors. However, all these medicines groundbreaking trials have not included patients with HF or ESKD. Due to safety and tolerability concerns, a lack of clinical trial evidence, and other factors, Guideline-Directed Medical Therapy (GDMT) is frequently withheld or not increased to suggested target doses in patients with HFrEF who are on dialysis. According to current practice guidelines, individuals with HF and ESKD are also ineligible for the start of multiple GDMTs. Although a few Randomized Clinical Trials (RCTs) have assessed the effectiveness of GDMT in patients with HF and CKD, there are still relatively few data available on how to manage HF in patients with ESKD who are receiving dialysis. Dialysis options for people with ESKD are still highly constrained. The majority of the available information is observational, and regulations reflect this scarcity of data. The Kidney Disease Outcomes Quality Initiative guidelines from the National Kidney Foundation note that Left Ventricular (LV) systolic dysfunction and LV hypertrophy are separate predictors of poor survival rates in patients receiving dialysis. They advise consistent maintenance of euvolemia as a cornerstone of HF treatment in patients receiving dialysis, with a likely need to adjust therapeutic drug dosage in accordance with Hemodialysis (HD) schedules. The use of renal replacement therapy as an HF therapeutic option in patients with ESKD and refractory volume overload is advised in the class IIa European Society of Cardiology guidelines from 2021. Guidelines, however, don't provide much guidance on how to manage these individuals' unique HF. It is not unexpected that patients with HFrEF who are on dialysis are less likely to obtain GDMT in observational registries given the absence of research and recommendation. Researchers demonstrated that patients with HFrEF and on dialysis received GDMT less frequently than patients with normal renal function and those with impaired renal function but not on dialysis in a cohort of 3124 patients with HF and on dialysis from the The Guidelines-Heart Failure (GWTG-HF) registry. The rate of compliance with GDMT and HF-specific process-of-care

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measures increased significantly over time, although the rate of improvement in clinical outcomes remained significantly lower than that of patients with normal renal function. More latest data from GWTG-HF from 2014 to 2019 also showed that GDMT adherence decreased with worsening CKD severity. The patients on dialysis and those with Estimated Glomerular Filtration Rates (eGFRs) 30 mL/min/1.73m$^2$ showed the greatest variations in the usage of GDMT for HF. In light of the foregoing, the purpose of this state-of-the-art review is to discuss the evidence that is currently available for each of the fundamental HF therapies in ESKD, to review the current difficulties and roadblocks in managing HF patients receiving dialysis, and to outline the future directions to improve HF management in these high-risk patients. Numerous studies show that beta-blockers lower cardiovascular mortality and HF hospitalization rates in people with HFrEF. Although beta-blockers account for 64% of all prescriptions for cardiovascular drugs given to dialysis patients, their effectiveness and safety in HF patients are yet unknown. 14 There is only one RCT, with 114 patients, that examined how beta-blockers affected HF patients who were receiving dialysis. At both the 6-month and 12-month follow-ups, patients receiving carvedilol showed significantly better Left Ventricular Ejection Fraction (LVEF), decreased left ventricular end-systolic volume (LVESV), and reduced Left Ventricular End-Diastolic Volume (LVEDV) compared with placebo. Additionally, patients using carvedilol as opposed to a placebo had a lower likelihood of having NYHA functional classes III or IV. Patients who have severe HF and ESKD concurrently and are receiving dialysis are particularly high-risk and are more likely to experience problems after transplantation. The prevalence of acute renal failure requiring dialysis following heart transplantation continues to be a significant clinical concern. The incidence of all-cause death was found to be 5-fold higher (HR, 5.2 [4.7-5.7]) in patients receiving dialysis following heart transplantation, according to a recent study by Shoji et al. These individuals are more vulnerable to clinical problems and have higher healthcare costs as a result of post-transplant dialysis. Therefore, in patients with concurrent end-stage HF and ESKD on dialysis, Simultaneous Heart and Kidney Transplant (SHKT) is typically advised. Despite having a significantly increased risk of morbidity and death, patients with HF who are on dialysis have a serious lack of credible information to guide care and advise best practice. Clinicians have been hesitant to recommend these drugs due to perceived worries about the efficacy and safety of traditional treatments for HF. In the future, trial-level data is required to support the effectiveness and safety of therapeutic HF treatments in dialysis patients. To create the best treatment plan for these patients, cardiologists and nephrologists must work together.