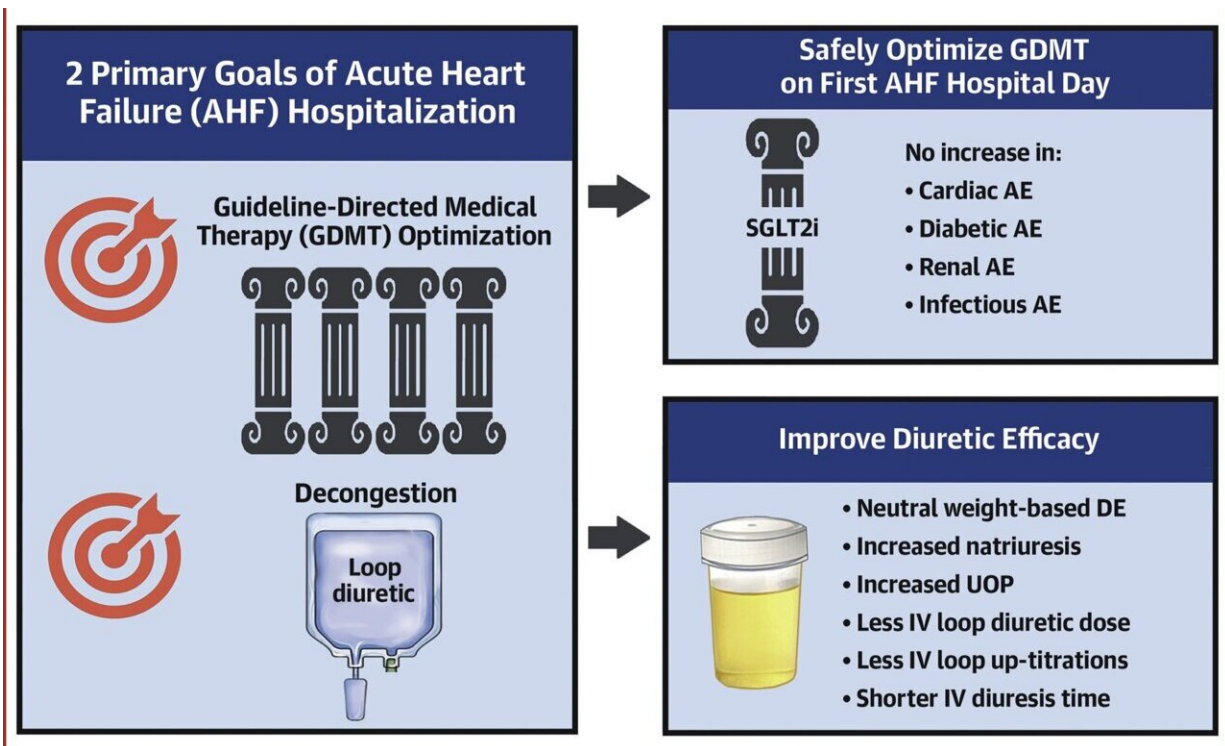


Diabetes drug shows promise for the treatment of acute heart failure

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Credit: *Journal of the American College of Cardiology* (2024). DOI: 10.1016/j.jacc.2024.02.009

A multicenter study led by Vanderbilt University Medical Center (VUMC) and Lipscomb University College of Pharmacy in Nashville has identified a potential new treatment for acute heart failure, a leading cause of hospitalization and death.

The drug, dapagliflozin, was initially approved for the treatment of type 2 diabetes, but it since has been shown to reduce the risk of hospitalization for heart failure and death in patients with serious health problems that include heart and [chronic kidney disease](#) and heightened cardiovascular risk.

[Reporting](#) this month in the *Journal of the American College of Cardiology*, the researchers found that dapagliflozin also benefits patients after admission to the hospital for [acute heart failure](#). The drug improves diuresis, the elimination of excess fluid from the lungs, thereby relieving congestion, and it can reduce hospital stays.

"We demonstrated safety and efficacy of initiating dapagliflozin within the first day of hospitalization for acute heart failure," said the paper's first author, Zachary Cox, PharmD, professor of Pharmacy Practice at Lipscomb University. This "will have international impact on the treatment of acute heart failure."

Each year 800,000 patients with acute heart failure are admitted to U.S. hospitals from emergency rooms. These patients are at high risk for prolonged hospital stays and death. The [annual cost](#) of treating acute heart failure in the United States is estimated to exceed \$34 billion.

Diuretics are administered to most patients with acute heart failure to improve symptoms and lung congestion caused by fluid buildup. However, the optimal approach to diuretic therapy in patients hospitalized for acute heart failure remains poorly defined and contributes to prolonged inpatient stays and high death and readmission rates.

Furthermore, many patients do not respond to diuretics, and about half of patients are discharged with persistent congestion. This can result in patients returning to the hospital soon after discharge and being

readmitted for further heart failure therapy.

Dapagliflozin is a sodium-glucose cotransporter 2 (SGLT2) inhibitor that acts on the kidneys to increase the removal of sodium and glucose from the body. In April 2020, VUMC began a randomized, clinical trial of the drug in patients hospitalized with acute heart failure.

The study was designed by VUMC's JoAnn Lindenfeld, MD, and Sean Collins, MD, MSc, and by Cox, a member of VUMC's heart failure research team.

Lindenfeld, professor of Medicine in the Division of Cardiology, is nationally known for her innovative contributions to the field of heart failure.

Collins, professor of Emergency Medicine, directs the Center for Emergency Care Research and Innovation (CERI), a national leader in emergency care research; co-directs the Vanderbilt Coordinating Center, which supports VUMC-led clinical research, and is associate director for [clinical trials](#) research in the Vanderbilt Institute for Medicine and Public Health.

Cox is a fellow of the Heart Failure Society of America who has published extensively in the field. Despite the COVID-19 pandemic, which reached its crescendo in the middle of the study, the researchers were able to enroll 240 patients and complete the trial, "thanks to the diligent effort and collaboration between the CERI research team, and ... the departments of emergency medicine and cardiology," Cox said.

Patients were enrolled at five sites in addition to VUMC: TriStar Centennial Medical Center and Ascension St. Thomas Hospital West in Nashville, the University of North Carolina at Chapel Hill, the University of Mississippi Medical Center in Jackson, and INTEGRIS

Health Baptist Medical Center in Oklahoma City.

Within 24 hours of admission for acute heart failure, patients were randomized to receive either dapagliflozin or conventional diuretic treatment.

While early administration of dapagliflozin did not improve weight-based diuretic efficiency compared to conventional treatment, patients who received the drug experienced no increase in adverse events, required shorter periods of IV diuresis, and were discharged faster during the five-day study period.

The trial demonstrated the safety and efficacy of starting a drug during early hospitalization that will continue to be prescribed upon discharge to help achieve optimal outpatient therapy and reduce the likelihood of readmission.

"It is a way to both improve diuresis AND get a head start on implementing Guideline Directed Medical Therapy in patients with acute heart failure," Lindenfeld said.

Other VUMC co-authors are Cathy Jenkins, MS, and Frank Harrell Jr., Ph.D., Department of Biostatistics, and Christina Kampe, MAcc, Karen Miller, RN, MPA, and William Stubblefield, MD, MPH, Department of Emergency Medicine.

More information: Zachary L. Cox et al, Efficacy and Safety of Dapagliflozin in Patients With Acute Heart Failure, *Journal of the American College of Cardiology* (2024). [DOI: 10.1016/j.jacc.2024.02.009](https://doi.org/10.1016/j.jacc.2024.02.009)

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