

# Outpatient Worsening Among Patients with Mildly Reduced and Preserved Ejection Fraction Heart Failure in the DELIVER Trial

**Safia Chatur, MD on behalf of:**

Muthiah Vaduganathan, MD, MPH, Brian Claggett, PhD, Jonathan W. Cunningham, MD, Kieran F. Docherty, MBChB, PhD, Akshay S. Desai, MD, MPH, Pardeep S. Jhund, MBChB, MSc, PhD, Rudolf A. de Boer, MD, Carolyn S.P Lam, MD, Mikhail N. Kosiborod, MD, Sanjiv J. Shah, MD, Felipe Martinez, MD, Silvio E. Inzucchi, MD, Adrian F Hernandez, MD, Magnus Petersson, MD, Anna Maria Langkilde, MD, John J. V. McMurray, MD, Scott D. Solomon, MD



@safchat

**ESC Congress  
2023 Amsterdam**



# Background and Rationale

- HF hospitalization is a sentinel event in HF disease trajectory, but not all patients experiencing worsening HF are hospitalized
- Outpatient oral diuretic intensification is frequent in clinical practice
- Prognostic relevance of outpatient oral diuretic intensification in HFmrEF and HFpEF is less certain
- Inclusion of such events in a composite endpoint may provide more complete capture of the spectrum of HF events and have implications for the conduct of future clinical trials

## Worsening HF Event



CV  
Death



HF  
Hospitalization



Urgent HF  
Visit

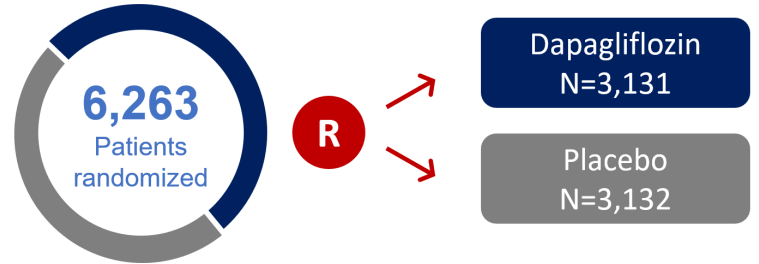


Oral Diuretic  
Intensification

# Objectives:

- 1) Assess the prognostic importance of the spectrum of worsening HF events including outpatient oral diuretic intensification.
- 2) Evaluate the implications of the inclusion of outpatient diuretic intensification in an expanded composite outcome

**DELIVER Population:**  
NYHA II-IV, LVEF>40%, + structural heart disease, ↑ NP

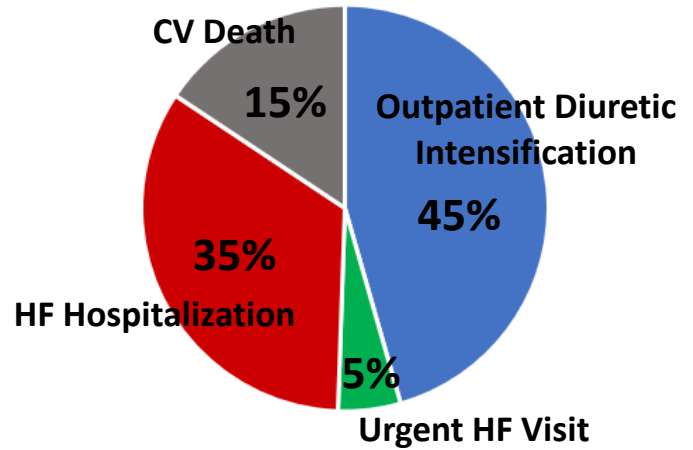


**Primary Outcome**  
Worsening HF or CV Death

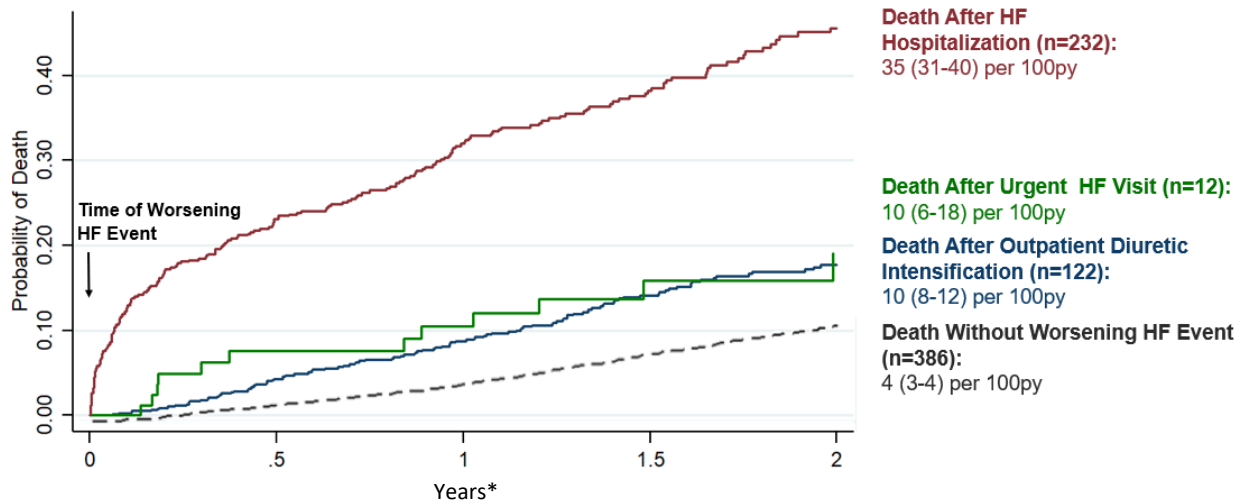
HR 0.82; p<0.001  
95% CI 0.73-0.92

During 2.3y median follow-up, 1731 total first worsening HF events occurred

## % of First Worsening HF Events By Type



# Prognosis After First Non-Fatal Worsening HF Event

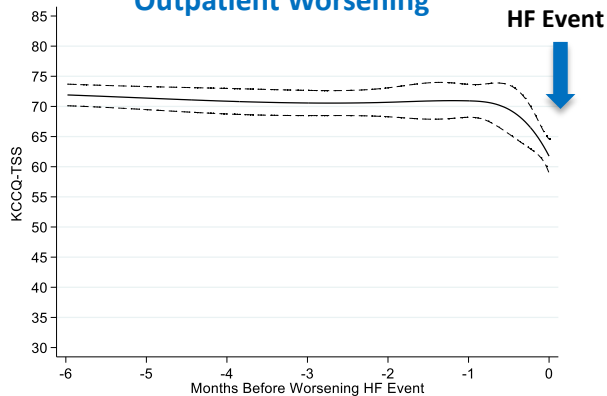


\*Time scale for patients with first worsening HF events (red, green, and blue lines) is time after worsening HF event and time scale for patients without worsening HF event (black dotted line) is time from randomization.

# Health Status Trajectories Prior to and Following HF Events

**A: Health Status Trajectory Before**

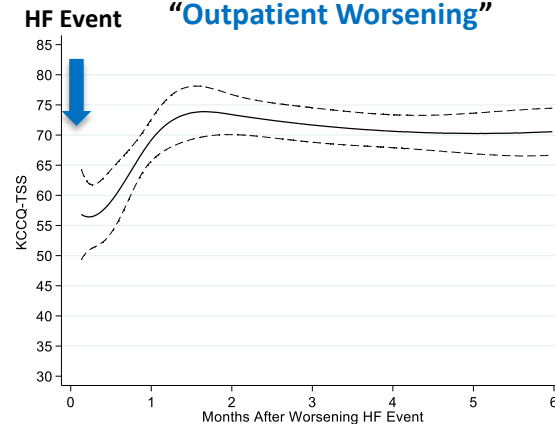
**“Outpatient Worsening”**



$\Delta \sim 10$  points in KCCQ-TSS

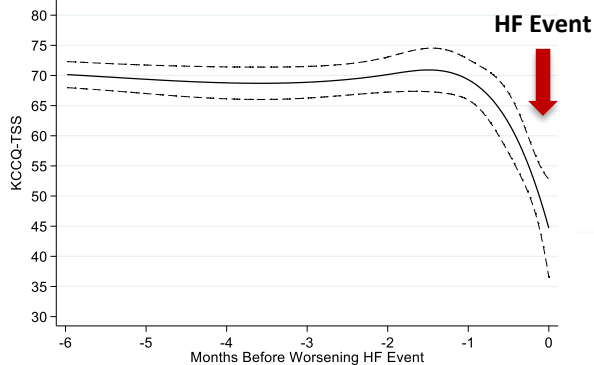
**B: Health Status Trajectory After**

**“Outpatient Worsening”**



**C: Health Status Trajectory Before**

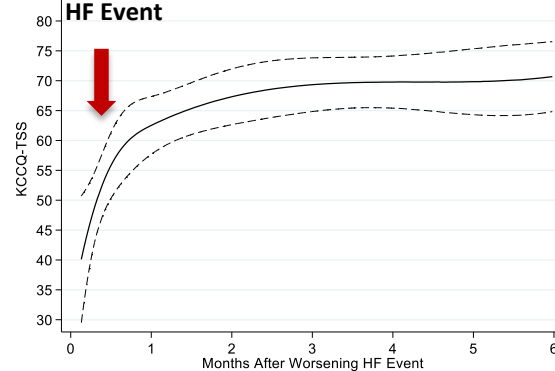
**“Inpatient Worsening”**



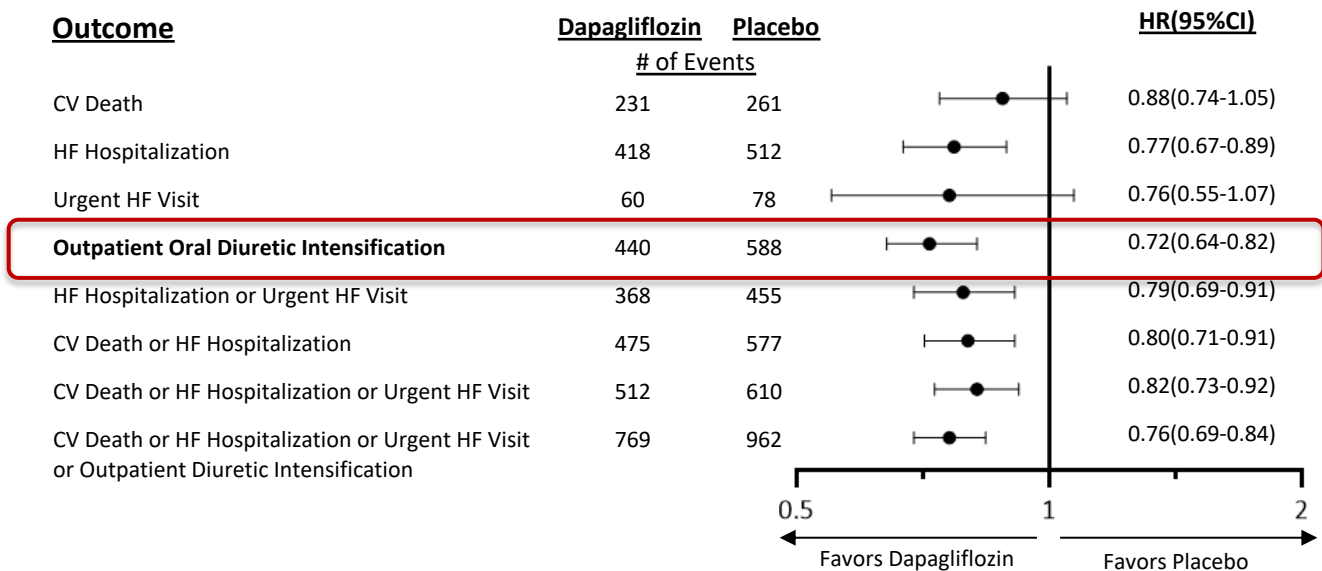
$\Delta \sim 25$  points in KCCQ-TSS

**D: Health Status Trajectory After**

**“Inpatient Worsening”**

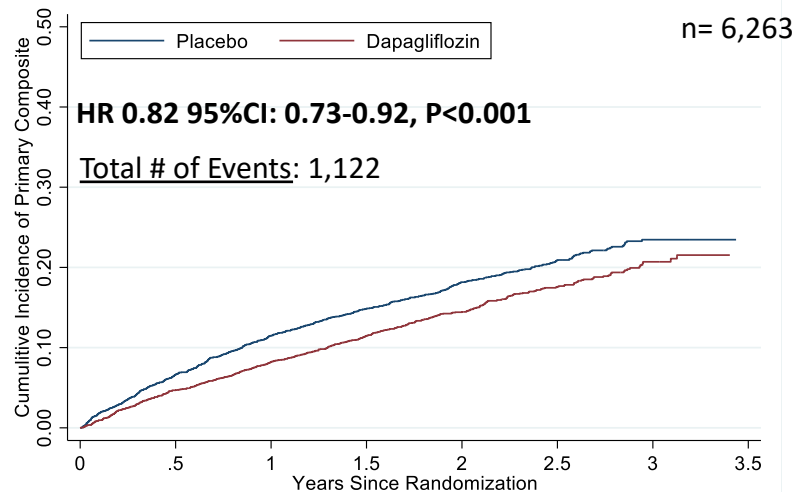


# Treatment Effects of Dapagliflozin on First Worsening HF Events

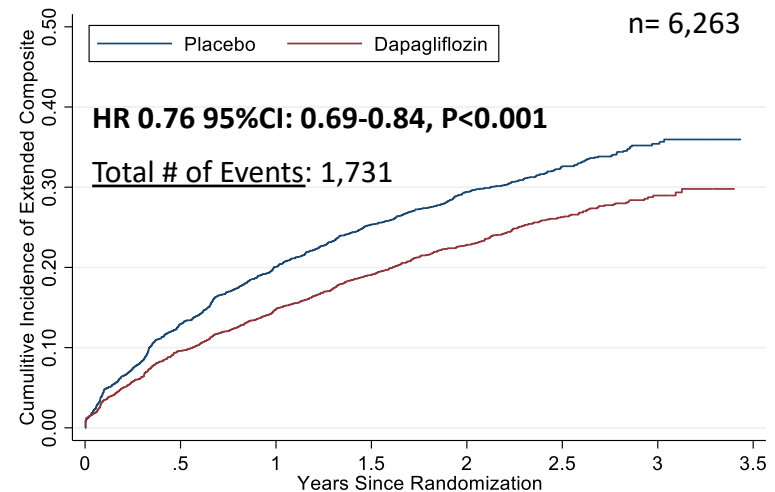


# Treatment with Dapagliflozin Reduced the Composite of CV Death, Worsening HF Event or Outpatient Diuretic Intensification

**A: Composite of CV Death or Worsening HF**



**B: Extended Primary Composite Outcome Including New Diuretic Initiation or Dose Increase**



**Addition of outpatient diuretic intensification to the primary composite outcome increased the number of events from 1,122 to 1731(54% increase) resulting in a 24% reduction in the extended composite with dapagliflozin.**

# Conclusions

- Outpatient oral diuretic intensification is a frequent first manifestation of worsening HF occurring in 1 in 8 patients with HF with mildly reduced or preserved EF.
- Oral diuretic intensification carries similar risk of subsequent mortality as an urgent HF visit requiring IV therapies and is preceded by clinically significant ↓ in health status.
- Treatment with dapagliflozin significantly ↓ the full spectrum of worsening HF events including outpatient oral diuretic intensification.

Simultaneously Published

**Circulation**

JOURNAL OF THE AMERICAN HEART ASSOCIATION



Available online at:

[https://www.ahajournals.org/  
journal/circ](https://www.ahajournals.org/journal/circ)

**Take Home Point: Oral diuretic intensification occurring in ambulatory care is frequent and prognostically relevant, its occurrence may represent a clinically meaningful juncture to interrupt the progression of HF and may have implications for future clinical trial design.**