

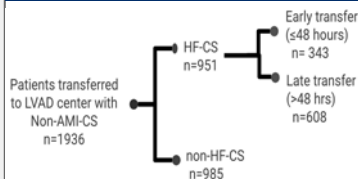
INTRODUCTION

- Patients with cardiogenic shock (CS) face high rates of morbidity and mortality.
- Transferring CS patients to advanced heart failure centers improves outcomes.
- Optimal timing of transfer is not well studied.

METHODS

- The Critical Care Cardiology Trials Network (CCCTN) is an investigator-initiated, multicenter network of tertiary CICUs in the US & Canada.
- Thirty-five advanced heart failure centers contributed data regarding patients transferred for heart failure cardiogenic shock (HF-CS) between 2017 and 2023.
- Early transfer ≤ 48 hours
- Late transfer > 48 hours
- Advanced heart failure center = CCCTN site with VAD program.
- In-hospital mortality compared using logistic regression adjusting for various patient and demographic factors

STUDY POPULATION



RESULTS

- Transfer groups were similar in age and sex, but more black patients were transferred late (Table 1).
- Late transfer cohort had more chronic medical conditions; early transfer cohort had higher SCAI scores, higher lactates, and required VA-ECMO more frequently (Tables 1,2).

- Late transfer had increased hospital and CICU length of stay, higher in-hospital mortality, and required increased ambulatory care needs at discharge (Table 2, Figure 1).
- Rates of advanced therapies were higher in the late transfer cohort (Table 3).
- Early transfer was associated with a 39% lower odds of in-hospital mortality (Table 4).

Table 1. Baseline characteristics

Characteristic	Early Transfer (N=343)	Late Transfer (N=608)	P
Age	61.0 (52.0-71.0)	61.0 (51.0-69.0)	0.17
Female	102 (29.7)	168 (27.6)	0.49
Race			0.0014
White	244 (71.1)	361 (59.4)	-
Black	57 (16.6)	143 (23.5)	-
BMI (kg/m ²)	27.2 (23.4-32.6)	27.5 (23.9-32.2)	0.54
Chronic kidney disease	82 (23.9)	201 (33.1)	0.0030
Pulmonary disease	57 (16.6)	95 (15.6)	0.69
Liver disease	6 (1.7)	29 (4.8)	0.018
De novo heart failure	129 (37.6)	151 (24.8)	<0.001
SCAI Stage			<0.001
Stage C	74 (21.6)	113 (18.6)	-
Stage D	121 (35.3)	268 (44.1)	-
Stage E	96 (28.0)	100 (16.4)	-
Adm. Lactate (mmol/L)	2.3 (1.5-3.7)	1.6 (1.1-2.5)	<0.001
Adm. Cr (mg/dL)	1.6 (1.2-2.3)	1.6 (1.2-2.5)	0.72
Peak Cr (mg/dL)	1.9 (1.4-3.0)	2.0 (1.4-3.2)	0.44
Vasoactive inotropic score (VIS)			
At 4 hours	3.0 (0.0-7.5)	5.0 (2.3-7.5)	0.0092
At 24 hours	3.0 (0.0-8.0)	3.9 (1.3-7.5)	0.042

Table 2. Clinical course & outcomes

Clinical Outcome	Early Transfer (N=343)	Late Transfer (N=608)	P
MCS during CICU stay			
IABP	56 (16.3)	171 (28.1)	<0.01
PVAD	6 (6.0)	16 (5.9)	0.98
Impella	28 (8.1)	76 (12.5)	0.98
VA-ECMO	23 (6.7)	24 (3.9)	0.028
Mortality			
CICU	43 (12.5)	104 (17.1)	0.061
In-hospital	59 (17.2)	146 (24.0)	0.014
Duration of stay			
CICU (days)	4.7 (2.5-8.7)	6.1 (3.2-12.4)	<0.01
Hospital (days)	11.8 (7.1-22.8)	16.0 (8.0-30.7)	<0.01

Table 3. Advanced outcomes

Advanced Outcome	Early Transfer (N=165)	Late Transfer (N=288)	P
Durable implantable VAD	7 (4.2)	30 (10.4)	0.021
Cardiac transplant	13 (7.9)	45 (15.6)	0.012
Non-transplant cardiac surgery	2 (1.2)	4 (1.4)	0.87
None of the above	20 (12.1)	53 (18.4)	0.080

Figure 1. Disposition trends

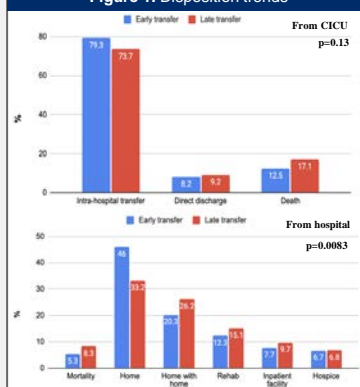


Figure 2. Causes of mortality

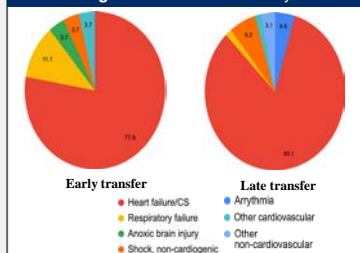


Table 4. Odds of in-hospital death

Model	OR	95% CI	P-value
Crude	0.66	0.47-0.92	0.014
Model 1 (Adjusted for age, sex, race)	0.59	0.41-0.83	0.0026
Model 2 (Adjusted for Model 1 + outpatient dialysis, cancer, dementia, liver disease, lung disease, BMI)	0.66	0.46-0.95	0.027
Model 3 (Adjusted for Model 1 + algorithmic SCAI, hemodynamics prior to transfer)	0.53	0.37-0.77	<0.001
Model 4 (Adjusted for all above variables)	0.61	0.42-0.89	0.0094

CONCLUSIONS

- Early transfer of patients with heart failure cardiogenic shock to advanced heart failure centers had lower in-hospital mortality, hospital LOS, and need for advanced therapies.
- Future studies are needed to evaluate what factors contribute to transfer timing in patients with CS