

Supplementary Materials

U-shaped relationship between guideline-directed medical therapy initiation timing and long-term adverse outcomes in acute heart failure

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Supplementary Table 1. ICD codes and corresponding diagnoses for enrolled patients

icd_code	icd_version	long_title
Acute heart failure		
42821	9	Acute systolic heart failure
42831	9	Acute diastolic heart failure
42841	9	Acute combined systolic and diastolic heart failure
I5021	10	Acute systolic (congestive) heart failure
I5031	10	Acute diastolic (congestive) heart failure
I5041	10	Acute combined systolic (congestive) and diastolic (congestive) heart failure
I50811	10	Acute right heart failure
Acute exacerbation of chronic heart failure		
42823	9	Acute on chronic systolic heart failure
42833	9	Acute on chronic diastolic heart failure
42843	9	Acute on chronic combined systolic and diastolic heart failure
I5023	10	Acute on chronic systolic (congestive) heart failure
I5033	10	Acute on chronic diastolic (congestive) heart failure
I5043	10	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
I50813	10	Acute on chronic right heart failure

Note. This table lists the International Classification of Diseases (ICD) codes (ICD-9 and ICD-10) used to identify patients with acute heart failure and acute exacerbation of chronic heart failure in the MIMIC-IV database. All included diagnostic codes were strictly screened to define the study cohort.

Supplementary Table 2. Drugs of guideline-directed medical therapy (GDMT)

Types of drugs	Drugs
Angiotensin-Converting Enzyme Inhibitors (ACEI)	Captopril
	Enalapril
	Lisinopril
	Ramipril
	Trandolapril
	Enalapril Maleate
	Enalaprilat
Angiotensin II Receptor Blockers (ARB)	Losartan
	Valsartan
	Irbesartan
	Candesartan
	Telmisartan
	Olmesartan
	Irbesartan-hydrochlorothiazide
Angiotensin Receptor-Nepilysin Inhibitors (ARNI)	Losartan Potassium
	Sacubitril/Valsartan
	Metoprolol
Beta-adrenergic Receptor Blockers	Bisoprolol
	Nebivolol
	Carvedilol
	Metoprolol Succinate XL
	Metoprolol Tartrate
Mineralocorticoid Receptor Antagonist(MRA)	Bisoprolol Fumarate
	Eplerenone
	Spirolactone

Notes. ACEI:Angiotensin-Converting Enzyme Inhibitors; ARB:Angiotensin II

Receptor Blockers; ARNI:Angiotensin Receptor-Neprilysin Inhibitors; MRA: Mineralocorticoid Receptor Antagonists. All listed medications are oral agents for guideline-directed medical therapy (GDMT) of heart failure. Intravenous diuretics, vasodilators and inotropic drugs administered for acute symptomatic treatment during ICU hospitalization were not categorized as GDMT in this study