

**Effectiveness of guideline-directed medical therapy  
for heart failure in frail elderly patients with malnutrition**

by

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## Abstract

**Background:** The early introduction of guideline-directed medical therapy (GDMT) has been shown to improve the prognosis of heart failure with reduced ejection fraction (HFrEF). However, the appropriateness of GDMT in the malnourished elderly patients is unclear due to comorbidities and polypharmacy. This study aims to assess the effects of GDMT on HFrEF in this specific population using the Geriatric Nutritional Risk Index (GNRI).

**Methods:** We retrospectively collected data of patients over 75 years old, who were admitted to St. Luke's International Hospital for acute heart failure with reduced ejection fraction from 2011 to 2022. Malnutrition was defined as a GNRI score below 92. GDMT was defined as the prescription of three or more of the following medications at the time of discharge: Beta-blockers, renin-angiotensin system inhibitors, mineralocorticoid receptor antagonists, and sodium-glucose cotransporter 2 inhibitors. The primary endpoints were all-cause mortality at one year after discharge and HF readmission.

**Results:** Among 471 patients (mean age  $83.9 \pm 6.0$  years), 323 patients (68.6%) had malnutrition. There was no significant difference in GDMT implementation rates between the low GNRI group and high GNRI group (38.7% vs 38.5%,  $p=1.00$ ). In the low GNRI group, GDMT was associated with a significant reduction in all-cause mortality at one year (HR 0.43; 95% CI, 0.22-0.83), but not in HF readmission (HR 0.78; 95% CI, 0.50-1.22) at one year after discharge. In the high GNRI group, GDMT

was not significantly associated with these outcomes (all-cause mortality: HR 0.55; 95% CI, 0.15-2.03, HF readmission: HR 0.64, 95%CI, 0.32-1.30).

**Conclusion:** Implementation of GDMT in HFrEF may enhance prognosis, even among elderly patients with malnutrition.

**Keywords:** Heart failure, Guideline-directed medical therapy, Malnutrition, Geriatric Nutritional Risk Index, Elderly

## **List of abbreviations**

GDMT	Guideline-directed medical therapy
HFrEF	Heart failure with reduced ejection fraction
GNRI	Geriatric Nutritional Risk Index
ACE-Is	Angiotensin-converting enzyme inhibitors
ARBs	Angiotensin receptor blockers
ARNI	Angiotensin receptor-neprilysin inhibitor
MRAs	Mineralocorticoid receptor antagonists
SGLT2-Is	Sodium-glucose cotransporter 2 inhibitors
BP	Blood pressure
COPD	Chronic obstructive pulmonary disease
eGFR	estimated glomerular filtration rate
NTproBNP	N-terminal pro-B type natriuretic peptide
HR	Hazard ratio
CI	Confidence interval
RCTs	Randomized controlled trials