

Major FTR determinants were elevated sPAP, more severe right and left ventricular dysfunction, mitral regurgitation, and AF ( $p < 0.0001$  for all). More severe FTR grade was associated with more severe clinical manifestations of heart failure (dyspnea, impaired renal function, and lower cardiac output,  $p < 0.0001$  for all). With higher FTR grades survival after diagnosis was markedly impaired unadjusted (figure) as well as with comprehensive adjustment (HR:1.12 [1.05–1.20],  $p = 0.0009$ ; HR:1.34 [1.24–1.45],  $p < 0.0001$ ; HR 1.81 [1.61–2.02],  $p < 0.0001$ ; for mild, moderate, and severe FTR vs. trivial FTR).

**Conclusion:** In patients with heart failure and reduced ejection fraction, higher FTR severity is not an innocent bystander and is associated to serious clinical consequences. Increasing FTR grades are independently associated with worse heart failure presentation and worse survival after diagnosis.

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**Myocardial constructive work is additive to left ventricular dyssynchrony and volumetric response to CRT in the prediction of overall mortality after CRT implantation**

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**Background:** Recent studies have shown that myocardial constructive work (CW) assessed by pressure strain loops (PSLs) is an independent predictor of the response to cardiac resynchronization therapy (CRT). Aim of our study is to assess if CW has an additive value in the prediction of long-term outcome of patients undergoing CRT, in addition to CRT response (CRT+) and left ventricular (LV) dyssynchrony.

**Methods:** 2D standard and speckle tracking echocardiography were performed in 166 CRT candidates (mean age: 66±10 years, males: 69%, QRS duration: 165±19 ms) before CRT implantation and at 6-month follow-up. Myocardial constructive work (CW) was assessed by PSLs. CRT+ was defined by a >15% reduction in left-ventricular end-systolic volume at 6-month follow-up and was observed in 48 (29%) patients. LV dyssynchrony was visually assessed by septal flash.

**Results:** After a median FU of 4 years (range: 1.3–5 years), all-cause death occurred in 28 patients (17%). At multivariable Cox-regression analysis, CW and age were the only prognostic predictors of cardiac death (Table 1). At ROC curve analysis, CW≤888 mmHg% was the best cut-off to predict all-cause mortality (AUC 0.67,  $p = 0.004$ ). Variables with a  $p$ -value <0.05 at univariable Cox-regression analysis were used to test the prognostic power of different nested models. Only the addition of CW≤888 mmHg% to a model including clinical variables (age and ischemic etiology for heart failure), SF, and CRT+ caused a significant increase in model power for the prediction of prognosis cardiac ( $\chi^2$ : 13.2 vs 28.1,  $p = 0.004$ ) (Figure 1).

Table 1

Cardiac death	Univariable analysis			Multivariable analysis		
	HR	95% CI	p-value	HR	95% CI	p-value
Age, per year	1.08	(1.01–1.15)	0.02	1.07	(1.00–1.15)	0.04
Ischaemic disease	3.99	(1.34–11.94)	0.01	2.33	(0.71–1.15)	0.16
NYHA >2	1.39	(0.46–4.24)	0.56			
LBBB	0.87	(0.27–2.77)	0.81			
LVEF, per %	0.99	(0.92–1.08)	0.89			
Septal flash	0.19	(0.06–0.62)	0.006	0.48	(0.12–1.95)	0.30
CW, per mmHg%	0.99	(0.99–1.00)	0.04	0.99	(0.99–1.00)	0.04
CRT-response	0.26	(0.09–0.78)	0.02	0.68	(0.18–2.57)	0.58

All-cause mortality

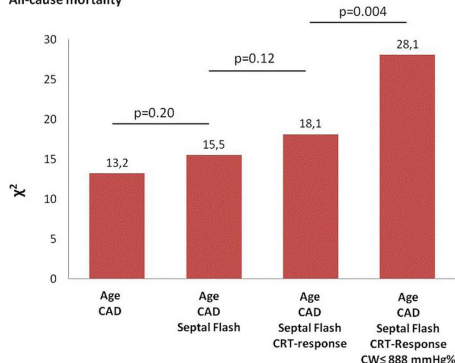


Figure 1

**Conclusions:** The estimation of myocardial CW has an additive value for the prediction of mortality in CRT candidates, over SF and volumetric CRT-response.

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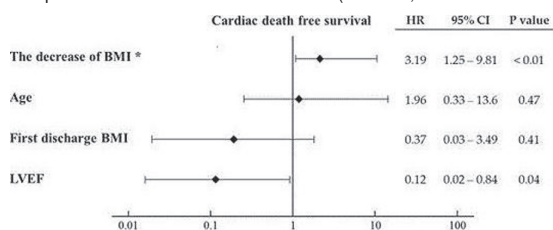
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**Losing body weight is a strong independent predictor of rehospitalization and prognosis in patients with heart failure**

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**Background:** Low body mass index (BMI) has been associated with decreased survival in patients with heart failure (HF), although Obesity is an important risk factor for cardiovascular disease. In a phenomenon known as the “Obesity Paradox”, HF patients with a relatively high BMI tend to live longer, but the reason for the phenomenon remains unknown. This study investigated whether a change in BMI is associated with either prognosis or frequency of hospitalizations in patients with HF.

**Methods and findings:** We correlated changes in BMI to prognosis and frequency of hospitalizations in patients who were hospitalized for decompensated HF between April 2009 and March 2013. A total of 971 HF patients were initially evaluated, and 81 patients with repeat HF admissions were included. The average change in BMI was  $-0.05 \pm 0.15$ ,  $-0.87 \pm 0.56$ ,  $-1.03 \pm 0.34$ , and  $-1.97 \pm 0.33$  in patients who were hospitalized twice, three times, four times, and over five times, respectively. The reduction in BMI correlated with the frequency of hospitalizations ( $p < 0.01$ ). We compared patients with increased BMI (group I,  $n = 38$ ) versus decreased BMI (group D,  $n = 43$ ) between the first and second discharge. The rate of hospitalization in group D was higher than in group I ( $p = 0.03$ ), and group D had a lower survival rate ( $p < 0.01$ ). The reduction of BMI was a significant and independent risk factor for cardiac death (HR 4.17, 95% CI: 1.53–14.6;  $p < 0.01$ ).



**Conclusions:** Losing body weight rather than low BMI in HF patients was a significant predictive factor of the frequency of hospitalizations and increased mortality.

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**Adverse impact of index of multiple deprivation on heart failure readmission and outcome**

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**Background:** NHS Scotland was created in 1948 to redress the healthcare inequality through provision of universal healthcare service. However even of late, significant health inequality persists. Socioeconomic deprivation are known to result in increased overall morbidity and mortality.

**Aim:** To assess the impact of socioeconomic deprivation (as categorised by Scottish Index of Multiple Deprivation, SIMD) on the medical management and clinical outcomes of patients with heart failure with reduced ejection fraction (HrEF).

**Methods:** A retrospective study of HrEF patients across Lanarkshire after outpatient optimisation of medical treatment. The parameters include basic demographics, ECG parameters and heart failure medications. Individual's socioeconomic deprivation index, as described SIMD was also recorded (1 – most deprived and 10 – least deprived), and accordingly placed into tertile (SIMD 1–3, 4–6, 7–9). Follow-up for 12 months. Clinical outcome assessed was composite endpoint event of heart failure readmission and/or death.

**Results:** 181 from the lowest tertile (SIMD 1–3), 131 from middle tertile (SIMD 4–6) and 84 from the highest tertile (SIMD 7–9) were included. No statistical difference exists between age or gender. No difference in past medical history (inclusive of hypertension, diabetes, dyslipidemia, ischaemic heart disease, family history, cerebrovascular disease, peripheral vascular disease, chronic renal failure or obstructive airway disease). Patients of highest tertile has higher incidence of nicotine use (10.7% vs 8.4% vs 7.7%,  $p = 0.02$ ).

No statistical difference in the cardiac rhythm (sinus vs atrial fibrillation) or advanced device utilisation.

Prescription of loop diuretics, Beta-Blocker (B-Block), angiotensin converting enzyme inhibitor (ACE-i) or angiotensinogen receptor blocker (ARB), and aldosterone antagonist were good and not statistically different between all groups. No differences regarding combination treatment (B-block + ACE-i/ARB or B-block + ACE-i/ARB + aldosterone antagonist. However, patients of highest tertile demonstrated trend towards more prescription of Angiotensin II Receptor Blocker Nephriysin Inhibitor (ARNI) (23.8% vs 16.8% vs 12.2%,  $p = 0.06$ ).

12 months follow-up demonstrated composite endpoint of heart failure readmission and mortality was statistically higher among patients of lowest socioeconomic tertile (Kaplan Meier plot,  $p < 0.001$ ). Stepwise multiple regression analysis also confirmed multiple socioeconomic deprivation as an independent predictor for more adverse clinical outcome for heart failure ( $p < 0.001$ ,  $R^2 = 15.7\%$ ).

**Summary:** Despite the establishment of universal healthcare and optimal pre-