to age and DM at baseline. Further including EF as a covariate does not improve the multivariable model (P=0.1)

	Univariate		Full adjustments	
	HR (95% CI)	P value	HR (95% CI)	P value
Age	1.1 (1–1.1)	<0.01	1.1 (1–1.1)	<0.01
Sex	1.2 (0.6–2.6)	0.6	1.1 (0.5–2.6)	0.8
BMI	1.0 (0.9–1.1)	0.6	1.0 (0.9–1.1)	0.4
DM	2.4 (1.2–4.8)	<0.02	2.7 (1.2–5.7)	0.01
HTN	1.5 (0.7–3.1)	0.3	1.3 (0.6–2.7)	0.5
Impaired GLS	1.2 (1.1–1.2)	<0.01	1.0 (0.9–1.1)	0.6
Impaired GLSR (0.1)	1.4 (1.3–1.5)	<0.01	1.4 (1.2–1.5)	<0.01
Impaired GCS	1.1 (1–1.2)	0.02	1.0 (0.9–1.1)	0.5
Impaired EF %	1.1 (1–1.1)	<0.01	1.0 (1–1.1)	0.1

Conclusion: In inpatients at long-term risk of HF, impaired GLSR is independently associated with an approximated 40% increased risk of new onset HF or mortality over a 4-year period.

P2746
Two-dimensional speckle tracking echocardiography for early triage of patients with acute chest pain: a TRAC-SI multicenter trial

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Background: Two-dimensional speckle tracking echocardiography (2D-STE) has been reported to be useful for the diagnosis of myocardial ischemia by detecting delay in regional myocardial expansion (diastolic stunning) up to many hours after an episode of angina. The hypothesis is that 2D-STE improves initial diagnosis in patients with possible acute coronary syndrome (ACS) who visit emergency department (ED) complaining of chest pain.
Methods: 388 consecutive patients with acute chest pain and without wall motion abnormality, who were admitted to an ED at 1 of 12 clinical sites in Japan, were enrolled and underwent 2D-STE at ED. Left ventricular (LV) longitudinal, circumferential, transverse and radial strain values at aortic valve closure (A) and one-third of diastole duration (B) were measured. The strain imaging diastolic index (SI-DI) was value was determined as: (A-B)/A×100% to assess the regional LV active relaxation and was used to identify the regional LV delayed relaxation. All patients underwent coronary CT or coronary angiography to establish the diagnosis of ACS. Clinicians were blinded to the 2D-STE results.
Results: Out of 388 patients, 2D-STE analysis was possible in 358 patients (92%). With assessment of coronary CT or coronary angiography, ACS was diagnosed in 114 patients (29%). 2D-STE was obtained at a mean of 5.3 hours after chest pain episode. SI-DI of longitudinal, circumferential, transverse and radial strain of ischemic segments were significantly lower than those of non-ischemic segments (30.4±18.4 vs. 73.1±25.4, 34.9±15.7 vs. 79.8±17.9, 38.7±18.3 vs. 81.3±23.5, 40.2±18.7 vs. 80.3±15.5, p<0.001, respectively), and transverse and radial SI-DI demonstrated high diagnostic accuracy (area under the curve: 0.83, 0.78, respectively). Sensitivity, specificity, and negative predictive value for ACS of transverse SI-DI are 80.5%, 67.0%, % and 90.4%, respectively, using a cut-off value of 65.6 (odds ratio: 9.3, 95% confidence interval: 5.9 to 18.7).
Conclusion: In patients with acute chest pain evaluated at ED, normal SI-DI could exclude ACS. Detection of diastolic stunning using 2D-STE at ER is a promising technique for the improvement of the initial diagnosis of ACS (UMIN000013859).

P2747
Left atrial longitudinal strain, left atrial size and left ventricular remodeling: implications for heart failure and preserved ejection fraction

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Background: Left atrial (LA) reservoir longitudinal strain (LSTR) has been proposed to be strongly dependent on LA volume. Whether LA LSTR predicts outcomes independently of LA volume index (LAVI) and left ventricular (LV) LSTR is controversial.
**Purpose:** We assessed the geometric determinants of LA LSTR and its association with death or heart failure (HF) admission, independently of LA geometry and LV LSTR.
Methods: We prospectively studied 640 adults without HF (n=419), HF with pre-

served ejection fraction (HFpEF, n=101), or HF with reduced ejection fraction (HFrEF, n=120). We measured LA and LV LSTR using feature-tracking MRI.
Results: HFrEF was characterized by greater absolute LV cavity, wall and epicardial volume, whereas HFpEF was characterized by abnormal relative LV and atrio-ventricular geometry (higher LA/LV maximum volume ratio and LV wall-to-cavity volume ratio). Both groups demonstrated LA enlargement. LAVI was associated with LA-LSTR (β=-0.29; P<0.0001), but this association was entirely based on relative LA-to-LV geometry, rather than absolute LV or LA volumes. Furthermore, LAVI was associated with LA strain independently of LV strain only in HFrEF (but not in HFpEF or subjects without HF). Although the LA/LV volume ratio was the key geometric determinant of LA-LSTR (β=-0.25; P<0.0001) in all groups, it was not itself predictive of incident death or HF admission over a median follow-up=37.1 months. In contrast, for any given LA size and global LV-LSTR, LA-LSTR was independently associated with incident death or HF admission (Hazard Ratio [HR]=0.63; 95% CI=0.47–0.84; P=0.0017). In analyses adjusted for clinical factors, LAVI, and LV ejection fraction, LA-LSTR was associated with incident adverse events (HR=0.70; 95% CI=0.51–0.96; P=0.0291; Figure), whereas LV-LSTR was not (HR=1.15; 95% CI=0.84 to 1.56; P=0.37).

Figure: Kaplan Meier survival curves for LA strain above (upper red curve) and below median (lower red curve). Dotted blue lines indicate 95% confidence interval
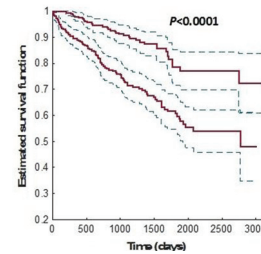
Conclusions: LA-LSTR is closely associated with the relative atrioventricular geometry, rather than LA size per se. LA-LSTR is predictive of incident adverse events independently of LA size and LV LSTR.

P2748
The cardiac isovolumic contraction time predicts heart failure in the general population

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Background: Color Tissue Doppler imaging (TDI) M-mode through the mitral leaflet is an easy and precise method to obtain cardiac time intervals. Our aim was to investigate if increased isovolumic contraction time (IVCT) as an early marker of systolic dysfunction could predict heart failure (HF) in the general population.
Methods: A total of 1,915 participants from the general population underwent a general health examination including TDI echocardiography. The IVCT was measured. The primary endpoint was HF. Prevalent HF was excluded (n=23).
Results: During a median follow-up time of 11 years, 123 (6.4%) participants were diagnosed with HF.
The risk of HF increased incrementally with increasing tertiles of IVCT, being approximately two-fold higher in the 3rd tertile as compared to the 1st tertile (HR 2.53; 95% CI (1.62–3.97), p<0.001) (figure). Assessing the association between IVCT and incident HF the risk increased with 29% per 10ms increase in IVCT (per 10 ms increase: HR 1.29; 95% CI (1.18–1.42), p<0.001). The association remained significant after adjusting for age, gender, hypertension, diabetes, body-mass index, previous ischemic heart disease, systolic blood pressure, heart rate, pro-BNP, eGFR, ejection fraction <50%, left ventricular mass index, E/e', E/A and the deceleration time (DT), (per 10ms increase: HR 1.19; 95% CI (1.03–1.37), p=0.022).
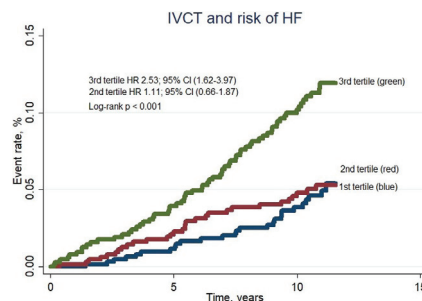

Figure 1