Methods The core cohort (502,655) was derived from the UK Biobank prospective study. Data from the CMR sub-study (39,703) were used which utilised a 1.5 Tesla scanner and an automated scan analyser. Participants with a history of CVD and loop diuretic use were excluded. Baseline characteristics, including demographics, comorbidities, and biomarkers, were compared. LV volumes and CO were compared, and linearly regressed for an association with SA ethnicity. HF incidence rates were calculated from new HF hospitalisations (ICD10 codes: I50.0, I50.1, I50.9, I11.0, I13.0 and I13.2). Cox-proportional hazards analysis determined comparative risk of developing HF.

Results Ninety-four (1.3%) of SA had HF and 4,218 (1.0%) of WE had HF. Higher proportions of WE with HF had elevated levels of cholesterol and smoking history (e.g.: 41.2% vs. 11.7% of SA with HF, $p<0.0001$). Higher proportions of SA with HF had hypertension and type 2 diabetes (33.0% vs. 9.0%, $p<0.0001$) and duration of diabetes (13 years vs. 7 years, $p=0.0018$). All indexed LV parameters were smaller after adjustment for prevalent risk factors (e.g.: LV end diastolic volume reduced by 20.7 ml, $p<0.0001$). A trend for a higher risk of HF was present in SA, which was attenuated by cholesterol (HR: 1.25, $p=0.072$ and HR: 1.11, $p=0.450$). **Conclusion** A trend for a higher risk of HF is present in SA, potentially due to cholesterol and smaller cardiac structures promoting myocardial strain in maintaining ejection fraction. Future research should determine causes of new HF events and confirm subtypes.

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INTER-FIELD STRENGTH AGREEMENT OF LEFT VENTRICULAR STRAIN AND STRAIN RATE USING TISSUE TRACKING AND AI DERIVED GLOBAL LONGITUDINAL SHORTENING

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Background The aim of this study was to assess the inter-field strength agreement of left ventricular (LV) strain, strain rates and artificial intelligence (AI) landmark-based global longitudinal shortening at 1.5T and 3T, using routinely acquired cardiovascular magnetic resonance (CMR) cine images.

Methods This was a prospective, randomised cross-over observational study in which healthy individuals completed two CMR scans at 1.5T and 3T in a randomised order within 30 minutes. Short and long-axis balanced steady state free precession cine imaging was acquired with retrospective electrocardiogram gating and scanning conditions standardised between field strengths. Analysis was undertaken offline by a single experienced observer blinded to participant details. CMR Tissue Tracking (*cvi42*, Circle Cardiovascular Imaging, Calgary,

Canada) was used to derive LV global longitudinal, circumferential and long and short axis radial systolic strain and peak systolic, early diastolic and late diastolic strain rates. Global longitudinal shortening was measured from long axis images using a fully automated method with an AI deep neural network model. All strain values are expressed as positive numbers.

Results Twenty-two individuals (mean age 36 ± 12 years; 45% male) completed the study. There were no significant differences in blood pressure or heart rate during scanning between field strengths. Figure 1 shows scatterplots and Bland-Altman plots for LV systolic strain measurements and global longitudinal shortening at 1.5T and 3T. Strain and strain rate

Abstract 22 Figure 1 Scatterplots (showing the unity line) and Bland-Altman plots for left ventricular global systolic strain and global longitudinal shortening measurements. GCS, global circumferential strain; GLS, global longitudinal strain; GRS, global radial strain; LV, left ventricular

measurements derived from short axis images (circumferential and short axis radial) showed good to excellent agreement between field strengths (intraclass correlation co-efficient (ICC) range 0.78–0.91). However, strain and strain rate measurements derived from long axis images (longitudinal and long axis radial) showed poor to fair agreement (ICC range 0.39–0.71). Global longitudinal shortening showed good agreement (ICC = 0.81). Minimal bias was seen in all measurements between field strengths.

Conclusions Inter-field strength agreement of short axis derived LV strain and strain rate measurements at 1.5T and 3T was good to excellent. By contrast, inter-field strength agreement of long axis derived measurements was poor to fair, but for AI landmark-based global longitudinal shortening agreement was good. These findings should be considered when assessing strain values from different field strengths.