

**Conclusion** Longitudinal myocardial strain, as revealed by strain-encoded CMR, is associated with chronological age in healthy adults.

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#### 24 PEAK CIRCUMFERENTIAL STRAIN ASSESSED USING STRAIN-ENCODED CARDIAC MAGNETIC RESONANCE (DENSE) IN HEALTHY VOLUNTEERS AT 1.5- AND 3.0 TESLA

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**Background** Displacement Encoding with Stimulated Echoes (DENSE) is a strain-encoded cardiac magnetic resonance (CMR) method that directly quantifies left ventricular (LV) mechanics within myocardial regions. Strain values might vary according to CMR field strength. In order to assess this possibility, we implemented strain-encoded CMR at 1.5 Tesla and 3.0 Tesla with DENSE in healthy adults.

**Methods** Healthy volunteers without any medical history or treatment gave informed consent and underwent CMR at 1.5T (Magnetom Avanto, Siemens Healthcare) and 3.0T (Magnetom Verio; Siemens Healthcare) within 24 h. The imaging protocol included balanced steady state free precession (b-SSFP) sequences for cardiac anatomy and function and strain-encoded CMR with DENSE. (CIM\_DENSE2D software (University of Auckland, New Zealand; Siemens Healthcare). Global- and segmental circumferential strain was measured at the mid-ventricular level.

**Results** Sixty five participants (31 (48%) male, mean age 44 ± 18) were included (Table 1). Mean global and regional strain values differed slightly between 1.5T and 3.0T, and these differences were mainly related to strain values in the anterior and anterolateral LV segments where LV displacement is greatest.

**Conclusion** Strain-encoded CMR with DENSE provides regionally localised measurements of circumferential strain. Subtle field-strength differences were apparent for anterior/anterolateral LV strain.

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**Abstract 24 Table 1** Global Circumferential Strain in 65 Healthy Volunteers

| Circumferential Strain (mid LV level) * | 1.5 T       | 3.0 T       | p-value |
|-----------------------------------------|-------------|-------------|---------|
| Mean value                              | 19.62 ± 2.6 | 18.78 ± 2.4 | 0.011   |
| Anterior                                | 21.32 ± 3.7 | 20.00 ± 3.5 | 0.014   |
| Antero-septal                           | 18.39 ± 3.5 | 17.70 ± 3.3 | 0.200   |
| Infero-septal                           | 16.69 ± 3.5 | 15.87 ± 3.5 | 0.118   |
| Inferior                                | 19.98 ± 3.5 | 20.26 ± 3.6 | 0.580   |
| Infero-lateral                          | 21.84 ± 3.4 | 21.17 ± 3.8 | 0.165   |
| Antero-lateral                          | 21.66 ± 3.5 | 20.42 ± 3.6 | 0.006   |

\*Expressed as mean, standard deviation

#### 25 THE USE OF CARDIOVASCULAR MAGNETIC RESONANCE (CMR) IMAGING IN THE ASSESSMENT OF PERSONNEL IN THE UK ARMED FORCES

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**Introduction** The Armed Forces places considerable occupational demands on its workforce. Cardiovascular disease (CVD) remains a common cause of death and premature discharge. Simple CVD screening is performed periodically throughout the careers of service personnel, particularly in those in high risk roles such as aircrew. Abnormalities commonly require investigation with advanced cardiovascular imaging.

**Methods** A retrospective cohort analysis of all military CMR requests to two military cardiologists was undertaken to determine demographics, reason for referral, results of investigation and occupational outcome.

**Results** Between 2011 and 2015, fifty-six patients (95% male, median age 44 years) were referred for CMR. The commonest indications were abnormal echocardiography (21%), ventricular ectopy (16%), suspicion of cardiomyopathy (13%) and other asymptomatic ECG abnormalities (T wave inversion (11%) and bundle branch block (7%)).

Of the CMR scans performed, 25% demonstrated features confirming cardiomyopathy (25% dilated and 12.5% hypertrophic phenotype). CMR features of athletic heart were seen in 11% of scans, and considered potentially suggestive of early cardiomyopathy. A quarter of patients had significant late gadolinium enhancement, in a variety of pathological patterns. Adenosine stress imaging was performed in 21% of patients, a quarter of which demonstrated perfusion abnormalities.

Whilst 30% of patients were able to return to unrestricted duties following CMR, 70% required occupational restriction, mostly in aircrew. Of these 18% were unable to fly pending further review, 36% were deemed unfit to fly solo, and 7% had restrictions placed on their ability to deploy on overseas operations.

**Conclusion** CMR is a valuable tool in the investigation of military personnel, and a useful adjunct to determine occupational, as well as clinical, risk. With the recent introduction of more rigorous CVD screening to join the Army, and the importance of comprehensive risk assessment in aircrew, the use of CMR in this population is likely to increase.

#### 26 CARDIOVASCULAR MAGNETIC RESONANCE ACTIVITY IN THE UNITED KINGDOM: RESULTS OF THE 2014 BSCMR SURVEY

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