

1-year 14.7% increase and a 10-year increase of 573% when considering survey data from 2008 (total n was 20,597). For comparison in 2017 the USA performed 26,796 CMR scans on 58.5 million Medicare beneficiaries (406 scans per million population) while the UK performed 1,548 per million that year (3.8X higher). By head of population in 2018 there were 1,776 CMR scans per million people, with significant variation nationally and regionally, e.g. 4,256 per million in London vs. 396 per million in Wales (Figure). Mean number of scans per unit was 1,404, (range 98-10,000) with wide variation in referral to diagnostic (RTD) scan times (mean RTD 45.7 days, range 5-180). Twenty-five units (29.8%) reported mean outpatient waiting times in excess of 6 weeks, and 8 (11.9%) reported waiting times of  $\geq 3$  months (e.g. 28.5 days waiting time in London vs. 180 days in Northern Ireland, Figure 1).

Clinical indications for CMR were: heart failure 20.7%, cardiomyopathy 26.6%, function and viability 22.0%, stress perfusion 23.7%, acquired vascular disease 5.4%, valvular heart disease 5.4%, myocarditis/pericardial disease 9.9%, stress 24%, paediatric / congenital heart disease 10.1%, cardiac transplant 0.4%, others e.g. cardiac masses 3.3%, with overlap between indications.

There were 358 consultants reporting CMRs in 2018 of whom 234 (65%) cardiologists and 124 (35%) radiologists. 81% of units had a CMR service for patients with pacemakers and defibrillators.

**Conclusion** The 2019 BSCMR CMR UK survey provides valuable insight into the 'real-world' state of CMR usage nationally. The 10-year growth in CMR usage at 573% has been remarkable, but not uniform across regions of England and devolved nations of the UK, with wide disparities in terms of use, access and waiting times. In regions where CMR usage is low or waiting times long, there is a concern that patients are being managed without the timely added benefits that this advanced cardiac imaging modality can bring to clinical care. The BSCMR is committed to take action to make access to CMR equitable across the UK.

**Conflict of Interest** None

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#### STRESS PERFUSION CARDIAC MAGNETIC RESONANCE IMAGING TO IDENTIFY CORONARY ANEURYSMS, ISCHAEMIA AND FIBROSIS IN ADULT PATIENTS WITH CONVALESCENT KAWASAKI DISEASE

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**Introduction** Kawasaki disease is a common cause of coronary aneurysms in early adulthood. Non-invasive imaging plays a crucial role in the diagnosis and surveillance of these patients who are known to develop ischaemia, premature coronary artery disease and have poorer long-term health outcomes. Stress perfusion cardiac MRI (CMR) is considered the 'gold standard' for the assessment of ischaemia and risk stratification of major adverse cardiovascular events in patients with coronary artery disease. Its use in the long-term follow-up of patients with Kawasaki disease is particularly attractive as it avoids the use of ionising radiation. However, data on its utility, together with magnetic resonance angiography (MRA) and late gadolinium enhancement (LGE) to identify ischaemia,

coronary aneurysms, and fibrosis, over long-term follow-up in this population remains limited.

**Purpose** To evaluate the diagnostic utility of comprehensive non-invasive stress perfusion CMR to identify inducible ischaemia, coronary aneurysms and myocardial fibrosis in adult patients with convalescent Kawasaki disease.

**Methods** We performed a retrospective review of adult patients in our Kawasaki service who underwent stress perfusion CMR with MRA and LGE as part of routine clinical care. Data collected included the presence of inducible perfusion defects, coronary anatomy and LGE. Data was compared to contemporary CT coronary angiography (CTCA). In patients who had repeated stress perfusion CMR, changes in perfusion over time were investigated.

**Results** Seventeen patients underwent stress perfusion CMR (total 30 scans). Seven patients underwent  $\geq 2$  scans. Median age was 21 years; 14 patients were male. Five patients (30%) had areas of inducible hypoperfusion of which 3 also had LGE. A further 2 patients had LGE with no ischaemia. Coronary MRA was performed in 12 patients (71%) and identified 14 aneurysms. In 8 patients with both MRA and CTCA, detection of aneurysms was significantly correlated (Pearson's coefficient 0.776; P value 0.024). Of the 5 patients with ischaemia, 4 patients had previous CABG. All areas of ischaemia had persistent calcified aneurysms in the artery supplying that myocardial territory. In the 7 patients with multiple perfusion CMR scans (median follow-up 47 months), 3 patients developed new ischaemia.

**Conclusions** Long-term surveillance of coronary arteries in adult patients with a childhood history of Kawasaki disease is crucial in the early identification and management of complications. We have shown that stress perfusion CMR is a useful radiation-free technique for the long-term follow-up of these young patients and is able to identify the development of new ischaemia. Coronary MRA has good agreement in the identification aneurysms when compared to CTCA. Little is reported in the literature regarding the use of a comprehensive CMR assessment in the follow-up of adult patients with Kawasaki disease and further studies are needed to validate this approach.

**Conflict of Interest** None

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#### MACHINE LEARNING AND CAROTID ARTERY CT RADIOMICS IDENTIFY SIGNIFICANT DIFFERENCES BETWEEN CULPRIT AND NON-CULPRIT LESIONS IN PATIENTS WITH STROKE AND TRANSIENT ISCHAEMIC ATTACK

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**Introduction** Carotid atherosclerosis is the main cause of ischaemic stroke. Texture analysis is a radiomic approach used to quantify image heterogeneity which can predict tumour aggression in oncology. We investigated whether this method could be applied to carotid artery disease to differentiate symptomatic from asymptomatic patients and culprit from