accelerated adenosine stress first-pass contrast enhanced CMR perfusion imaging at 1.5T MRI. Absolute stress MBF was derived. Visual analysis of the dynamic perfusion series was undertaken by two expert CMR readers. Diagnostic accuracy was determined on presence of significant CAD as defined by ICA and FFR ≤ 0.80 using Area under the Curve (AUC) from receiver operator characteristic curves.

**Results** At the patient level, there was significantly lower MBF in patients with CAD compared to those without CAD (2.03 [1.82 – 2.37] vs 2.68 [2.31 – 2.93] ml/g/min, p<0.001). There was a high diagnostic accuracy for the detection of CAD for quantitative stress MBF with AUC 0.84 (95% confidence interval [CI] 0.68–0.94, p<0.001), and for visual analysis with AUC 0.89 (95% CI: 0.75 – 0.97), p<0.0001). These were not significantly different (p=0.52). The optimal threshold for MBF detection of CAD was ≤2.50 ml/g/min, with sensitivity of 100% (95% CI: 77%-100%) and specificity of 71% (95% CI: 49%-87%).

**Conclusion** High-resolution quantitative near whole-heart myocardial perfusion imaging shows good diagnostic accuracy for detection of significant CAD, with comparable accuracy compared to expert visual analysis. This technique could be considered for automated widespread clinical use without the need for expert analysis of visual dynamic perfusion images.

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for rapid, focused protocols to increase throughput, improve cost-effectiveness and reduce waiting lists is now essential. We designed and implemented two new rapid CMR protocols incorporating AI approaches in daily clinical practice and measured their impact.

Methods As part of service level improvements, we implemented two protocols:

Protocol 1: rapid Perfusion CMR for ischaemia/viability;
Protocol 2: rapid non-contrast CMR for cardiotoxicity. These protocols used inline perfusion mapping with AI analysis, and inline ventricular analysis using the Mycardium AI super-human analysis approach. 

A total of 260 patients were recruited and allocated to either rapid or standard CMR. Scanning times (first to last image timestamp), and image quality (consensus of 2 observers) were assessed.

Results

Protocol 1: Conventional stress imaging took an average of 36 minutes (range 24–52 minutes, n=80). Rapid perfusion CMR took an average of 23 minutes (range 14 to 31 minutes, n=120), an average saving of 13 minutes (p<0.001)

Protocol 2: Conventional non-contrast CMR took 15.0 minutes (range 11 to 20) minutes. Rapid non-contrast CMR took 9.9 minutes (range 5–13 minutes, including inline analysis), an average saving of 5.1 minutes – but this shorter scan included the inline AI analysis, an additional reporting saving.

For both protocol 1 and 2, the scan quality was considered similar (3/3, good).

Conclusion Rapid CMR protocols incorporating AI approaches permit major savings on scan duration without any apparent image quality penalties. Scans can consistently be performed in less than 25 minutes and less than 10 for non-contrast).

Sequelae Following this trial, rapid CMR approaches have become routine for ~1/4 patients at our site and booking slots have been reduced to 50 minutes (from 1 hour) on all CMR booking diaries with a daily increase in activity of +3 patients a day with consequent benefits to waiting lists.

REFERENCES
