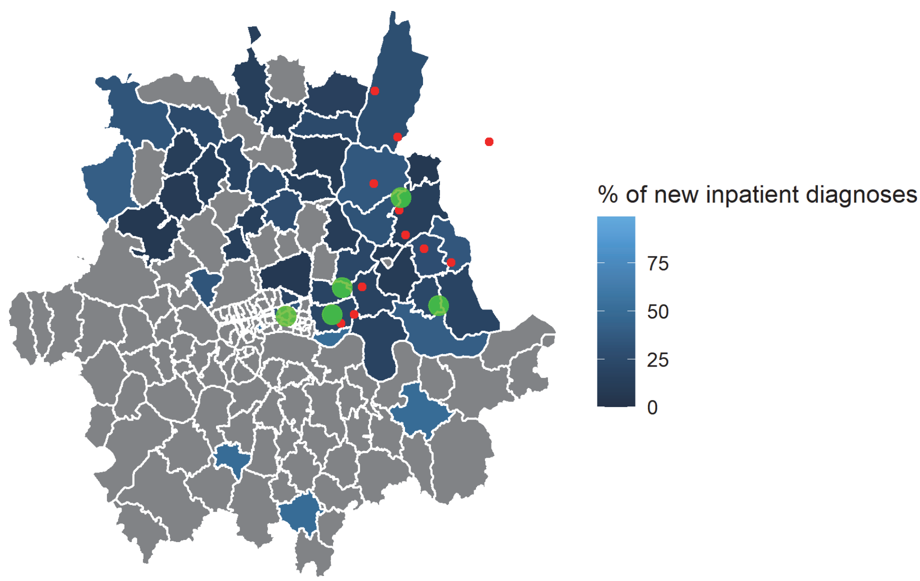


**Abstract 13 Figure 2**

identifying the postcode and GP practices for with the highest proportion of patients with severe valvular disease that were diagnosed during acute inpatient admissions. 376 individuals had severe valvular lesions identified during acute admission, of which 269 (72%) had no previously documented echocardiogram. A cluster of 11 GP practices (9%, 11 of 117 practices) were identified as having a higher proportion of diagnoses of severe valvular disease on acute admissions [figure 1]. These 11 were plotted geographically, alongside correlating postcodes, to identify geographical hotspots [figure 2]. Analyses were undertaken using Matlab, R and ggplot2.

**Conclusions** A geographical cluster of GP practices, centred around a single hospital, had a higher proportion of patients diagnosed with severe valvular disease during acute admissions without a previous echocardiogram. Outreach echocardiography provision in these regions could potentially identify patients with valvular disease before acute decompensation. Further work should focus on improving methodology to identify cases and investigating risk factors that predispose to diagnosis of severe valvular disease in extremis.

**Conflict of Interest** none

## 14 TIME TO TAVI: STREAMLINING THE OUTPATIENT PATHWAY TO TREATMENT

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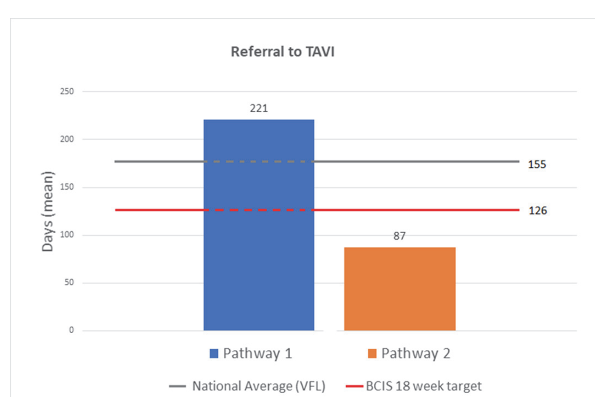
**Introduction** Transcatheter Aortic Valve Implantation (TAVI) is an established treatment option for severe aortic stenosis (AS), with over 5000 procedures performed in the UK in 2019. Given the high morbidity and mortality associated with delay to treatment, the British Cardiovascular Intervention Society proposes a diagnosis to procedure window of 18 weeks. However, in the UK TAVI Survey (2019), over 50% of centres reported difficulty in increasing capacity to meet this demand and the average timescale to TAVI was far longer than this target at 155 days. Streamlining patients to a dedicated structural clinic, a model proposed by Valve for Life UK, is therefore desirable to achieving these targets.

**Methods** To improve the timeline to TAVI at a district general hospital (DGH), we optimised the referral process in 3 key areas. Firstly, direct triage to TAVI clinic by physiologists at the time of echo diagnosis, negating the need for initial assessment by a general cardiologist. We utilised specialist CT analysis software (3-Mensia), allowed CT images to be analysed locally rather than during MDT meetings, increasing capacity to discuss more cases in the time saved. Lastly, the procedure was often completed by the same structural interventionalist that had initially assessed the patient, eliminating the need for further clinic review in a specialist centre and providing continuity of care. We compared 2 pathways of patient care: pathway 1, representing existing processes, and pathway 2, representing this novel way of working.Data was collected retrospectively over a 2-year period (pathway 1 duration 16 months, pathway 2 duration 7 months) for all patients with severe aortic stenosis who were intended for TAVI procedure. We considered death whilst waiting for procedure or admission with progressive AS symptoms as adverse events.

**Results** A total of 65 cases were reviewed, 44 were managed as outpatients and 15 inpatients. We excluded 5 cases treated




**Abstract 14 Figure 1**

along both pathways and 1 deemed clinically not suitable for TAVI after initial investigation. Of the 44 outpatients, 28 patients were managed in pathway 1 (1.8 patients per month) and 16 in pathway 2 (2.3 patients per month). The mean time from entry to pathway to procedure was 221 days in pathway 1 and 87 days in pathway 2 (p<0.001). 94% of outpatients in pathway 2 were treated within the 18-week target compared to only 19% in pathway 1. There were 5 adverse events in pathway 1 but no adverse events in pathway 2 (figure 1).

**Conclusions** Improving our local TAVI pathway has led to a significant reduction in the time to treatment. Most outpatients now undergo TAVI well within the BCIS 18-week target and 68 days faster than the UK average. Though the numbers are small, we also demonstrated an associated reduction in adverse events. These findings suggest that adopting a dedicated structural clinic model has led to significant improvements at DGH level, ultimately resulting in reducing the time to TAVI and improving patient care.

**Conflict of Interest** None

## 15 BIVENTRICULAR ASSESSMENT AND QUANTIFICATION OF PRIMARY MITRAL REGURGITATION IS FEASIBLE AND REPRODUCIBLE DURING CONTINOUS SUPINE EXERCISE CARDIOVASCULAR MAGNETIC RESONANCE

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**Background** Biventricular volume and great vessel flow assessment during continuous supine free-breathing exercise cardiovascular magnetic resonance (Ex-CMR) has recently been validated in healthy volunteers using Compressed SENSEx3 (CS3) sequences. Exercise transthoracic echocardiography (TTE) provides prognostic information in primary mitral regurgitation (MR). Resting CMR offers reference standard biventricular assessment and MR quantification with superior reproducibility to TTE. Ex-CMR assessment of biventricular volumes and quantitated MR may offer additional prognostic information in primary MR. Therefore we aimed to determine the feasibility of biventricular assessment and MR quantification in primary MR patients during continuous supine Ex-CMR using CS3 sequences.

**Methods** 10 asymptomatic patients with at least moderate primary MR on TTE (8 male, median age 62, 55-67years interquartile range) underwent continuous in-scanner (1.5T Philips Ingenia) supine cycle ergometer (Lode BV) Ex-CMR. Target heart rates (THR) were individually prescribed using heart rate reserve (HRR) and age predicted maximal heart rate model. Participants exercised for 2-minutes at no resistance, then an increase of 25-Watts every 2-minutes until THR achieved at low (30-39% HRR), then moderate (40-59% HRR) exercise. CMR imaging: free-breathing CS3 respiratory navigated short axis cine imaging and free-breathing CS3 aortic phase-contrast magnetic-resonance at rest, low and moderate exercise stages. MR was quantified indirectly from LV and aortic stroke volumes. Intra/inter-observer reproducibility was assessed by coefficient of variance (CV).

**Abstract 15 Table 1** Haemodynamicand cardiac indices at rest and during supine Ex-CMR

| | Exercise Stage | | | p-value |
|---|---|---|---|---|
| | Rest | Low | Moderate | |
| Heart rate (bpm) | 61±10 | 98±6 | 115±6 | <0.001 |
| LV-end-diastolic volume (ml/m$^2$) | 112±23 | 111±21 | 107±22 | 0.185 |
| LV-end-systolic volume (ml/m$^2$) | 41±12 | 36±9.8 | 37±11 | 0.055 |
| LV ejection fraction (%) | 64±4.9 | 67±5.1 | 66±6.1 | 0.075 |
| MR-volume (ml) | 56±25 | 52±23 | 42±24 | 0.032 |
| MR-fraction (%) | 40±14 | 36±11 | 30±15 | 0.006 |
| RV-end-diastolic volume (ml/m$^2$) | 86±16 | 87±15 | 87±12 | 1 |
| RV-end-systolic volume (ml/m$^2$) | 38±8.0 | 34±5.0 | 32±6.5 | 0.122 |
| RV-ejection fraction (%) | 55±5.4 | 60±6.0 | 63±6.6 | 0.001 |

Abbreviations: Ex-CMR, Exercise Cardiovascular magnetic resonance; HR, heart rate; i, Indexed to body surface area; LV, left ventricle; MR, mitral regurgitant; RV, right ventricle.

**Abstract 15 Table 2** Reproducibilityof cardiac indices during Ex-CMR

| | Co-efficient of Variance | | | | | |
|---|---|---|---|---|---|---|
| | Intra-observer | | | Inter-observer | | |
| | Exercise stage | | | Exercise stage | | |
| Cardiac Indices | Rest | Low | Mod | Rest | Low | Mod |
| LV-end-diastolic volume | 1.56 | 2.09 | 2.3 | 2.13 | 4.65 | 3.79 |
| LV-end-systolic volume | 3.83 | 4.85 | 5.05 | 6.17 | 10.7 | 9.06 |
| LV-ejection fraction | 2.08 | 1.69 | 2.18 | 3.25 | 3.34 | 3.19 |
| RV-end-diastolic volume | 4.59 | 6.36 | 5.01 | 3.03 | 8.36 | 4.72 |
| RV-end-systolic volume | 7.30 | 12.38 | 10.28 | 10.22 | 17.06 | 16.68 |
| RV-ejection fraction | 4.80 | 7.18 | 5.57 | 7.08 | 9.14 | 8.31 |
| MR-volume | 5.05 | 5.98 | 12.17 | 10.63 | 10.38 | 16.74 |
| MR-fraction | 3.75 | 4.44 | 10.62 | 8.26 | 7.92 | 15.23 |

Abbreviations: EF, ejection fraction; LV, left ventricle; MR, mitral regurgitation; RV, right ventricle.

**Results** All patients completed the Ex-CMR protocol without complication. During exercise, there were no statistically significant changes in biventricular volumes or global left ventricular ejection fraction (LVEF) (table 1). From rest to low and moderate exercise: right ventricular ejection fraction increased (55±5.4% to 60±6.0% and 63±6.6% respectively, p=0.001) and MR fraction decreased (40±14% to 36±11% and 30 ±15% respectively, p=0.006). Intra-observer reproducibility (table 2) was excellent (CV <10%) except MR fraction & volumes during moderate and right ventricular end-systolic volumes (RVESV) during both exercise stages, which were good (CV10-20%). Inter-observer reproducibility (table 2) was excellent (CV<10%), except RVESV and MR volumes at all stages, left ventricular end-systolic volumes during low and MR fraction during moderate exercise, which were good (CV 10-20%).

**Conclusion** Biventricular assessment and MR quantification during continuous supine Ex-CMR is feasible and reproducible in asymptomatic primary MR patients. Research assessing the techniques prognostic ability in primary MR patients is now warranted.

**Conflict of Interest** Nil