of the HoCM cohort) also meet the symptomatic inclusion criteria. Initiation of myosin ATPase inhibitors paralleling EXPLORER-like trial standards of 4-weekly follow-ups, including imaging and blood tests, will effectively require an additional weekly clinic session to on-board all eligible patients at our site over a 16-week period.

Conclusion We find that although most HCM patients with LVOTO can be managed with existing therapies, a significant unmet need attributable to symptomatic obstruction remains. 8.5% of our HCM cohort would be the focus of initial myosin ATPase inhibitor roll out should these therapies become available. This would come with attendant resource implications that may only be practical to deliver in larger ICC centres.

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Conflict of Interest Dr Matthew J Daniels (last author) reports advisory board payments from Bristol Myers Squibb

18 A REVIEW OF THE ADULT FONTAN POPULATION IN YORKSHIRE AND THE HUMBER

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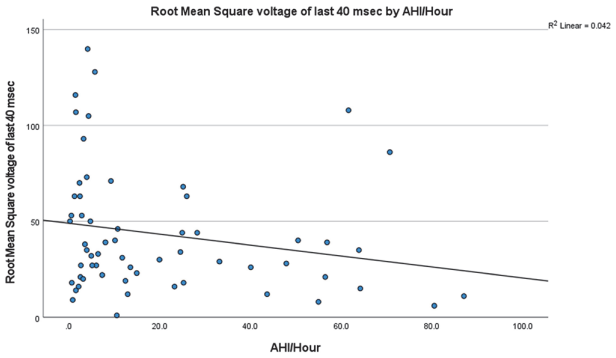
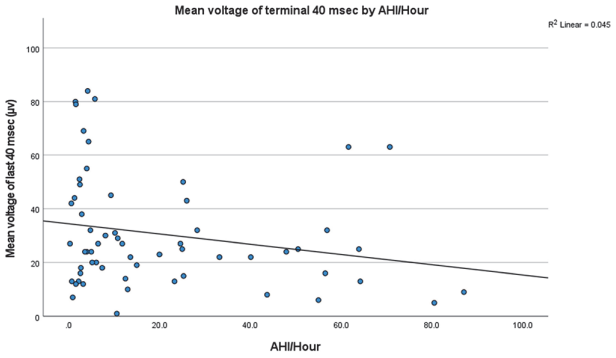
Background The Fontan circulation is associated with a number of long term complications including supraventricular arrhythmia, liver disease and circulatory failure. As the population of Fontan patients expands and becomes older we expect to see a rise in the number of these complications.Within Yorkshire and the Humber, we have generated a protocol of investigations for adult Fontan patients with the aim of identifying clinical decline or the development of complications in a timely manner to enable instigating treatment and/or intervention. Our aim was to review the compliance with this protocol and assess for any trends in our Fontan patients in order to develop more streamlined follow up of complications. MethodsWe retrospectively reviewed a cohort of 116 adult Fontan patients from September 2021 to February 2022. As well as collecting baseline demographic data (Table 1) on age, gender, type of Fontan and years since Fontan completion, we assessed compliance with our current clinical protocol, which includes annual echocardiography and liver assessment (serology and imaging), and three yearly cardiopulmonary exercise testing (CPEX), cardiac MRI and ambulatory ECG monitoring. As part of the liver assessment we also reviewed patients who had an Enhanced Liver Fibrosis score (ELF).

Results Of our cohort, 83 (72%) had undergone total cavopulmonary connection (TCPC), 16 (13%) lateral tunnel (LT) and 17 (15%) atrio-pulmonary connection (AP). Chart 1 shows the proportion of patients who have undergone investigations as per our protocol. The mean VO2 Max for this cohort was 21.7 mL/kg/min (range 10.5 - 34.6 mL/kg/min) which was similar across all Fontan groups with 31% (n=19) falling between the 50th and 75th Brompton centile (2). 15 (13%) patients had a cardiac device in situ, 7 (8%) of TCPC, 3 (19%) of LT and 5 (29%) of AP. Abnormal liver serology was present in 57 (52%) patients. The mean ELF score was 9.2 (range 7.3 - 11.6) which was again similar across all Fontan groups. Liver imaging was performed in 101 (87%) patients, 93 (92%) with ultrasound and 8 (7%) with MRI. In total 57 (56%) had abnormal liver imaging with a greater proportion seen within the AP Fontan group (82%) compared to both LT (69%) and TCPC (47%) groups.

Discussion and Conclusions A number of factors played a part in the compliance of investigations performed in this cohort of patients. This included factors such as poor mobility, negating the ability to undergo CPEX, MRI incompatible devices, non-attendance to follow up and geographical factors. One outcome of interest is the greater proportion of abnormal liver imaging seen in patients with AP Fontan, although time



Abstract 18 Figure 1 Association between Root Mean Square Voltage and AHI/Hour



Abstract 18 Figure 2 Association between Mean Voltage of Terminal 40msec of filtered QRS and AHI/Hour

Abstract 18 Table 1

	OSA Category		
	No Sleep Apnoea (n=22) Mean	Sleep Apnoea (n=38) Mean	Sleep Apnoea on Treatment (n=24) Mean
Filtered QRS, msec	122	131	132
Signal Duration, msec	30	38	37
Root Mean Square voltage of last 40 msec	56	36	30
Mean voltage of last 40 msec	39	26	22

since Fontan completion may largely explain this finding. This review has helped shape the planning of follow up for patients with Fontan circulation in Yorkshire and the Humber. Multicentre analysis would be useful in comparing cohorts and the standard of follow up for this growing population of patients.

Conflict of Interest Nil

19 SIGNAL AVERAGED ECG CHANGES IN HYPERTROPHIC CARDIOMYOPATHY WITH OBSTRUCTIVE SLEEP APNOEA

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Background Hypertrophic cardiomyopathy (HCM) and obstructive sleep apnoea (OSA) are independently associated with increased risk of arrhythmic events. Oximetry based studies suggest a high prevalence of OSA in HCM. Signal Average ECG (SAECG) is a non-invasive method of detecting late ventricular potentials which are low-amplitude, high-frequency signals occurring in the terminal portion of the QRS complex, analysis of which may aid in predicting the risk of reentry ventricular arrhythmias and sudden cardiac death. SAECG parameter profiles in HCM with concurrent OSA have not been previously studied.

Methods In this prospective study, 84 patients with HCM (24 of whom had previously diagnosed OSA and were treated for this) underwent SAECG analysis. The 60 HCM patients with no prior history of OSA underwent polysomnography assessment to determine their OSA status and severity. The final sample included 58 males (69%). An Apnea Hypopnea Index (AHI) >5/Hr was considered diagnostic for OSA (5–15 mild, 15–30 moderate, >30 severe).

Results 62 (74%) subjects were found to have OSA (15 mild, 9 moderate, 14 severe, 24 treated). Subjects with OSA were older with higher BMI. For analysis, subjects were split into those without sleep apnoea, those with sleep apnoea and those with sleep apnoea on treatment. No significant differences were found between groups in filtered QRS duration nor terminal QRS duration however the root mean square voltage of the terminal 40 ms of the QRS segment was significantly lower in the sleep apnoea group (mean 36 msec) when compared to the non-OSA group (mean 56 msec, p=0.028) and lower still in the treated OSA group (mean 30 msec, p=0.007). Similarly, the mean voltage of the terminal 40 msec of the filtered QRS segment was significantly lower in the sleep apnoea group (mean 26μv) when compared to the non-OSA group (mean 39μv, p=0.034) and again was lower still in the treated OSA group (mean 22μv, p=0.007). Those

Abstract 19 Table 1 Study characteristics

Study	Year	Design	No. of patients; n	Follow-up (years)	New pacemaker; %	Age (years); mean ± SD	Females; %	AF;%	LBBB; %	RBBB; %	Predictors of pacemaker insertion	Criteria for new pacemaker
Keefe et al. [8]	1985	Prospective cohort	100	4.74	3	54.4 ±13.56	NR	63	NR	NR	NR	Transient or permanent AVB
Kim et al. [9]	2001	Retrospective	155	1.08	10.96	54 ± 23	NR	44	NR	NR	AVR + MVR	Second and Third degree AVB
Meimoun et al. [10]	2002	Prospective cohort	115	3	2.6	56 ± 16	43.47	12.17	5	5	Systemic hypothermia	Third degree AVB
Berdajs et al. [11]	2008	Retrospective	391	3	4.34	57.6 ± 13	43.73	1.7	2.6	4.6	Cross-clamp time, anti-arrhythmic drugs (digoxin, sotalol, amiodarone)	Third degree AVB
McClure et al. [12]	2009	Retrospective	707	5.66	1.7	57 ± 13	39	20	NR	NR	NR	AVB
Alsoufi et al. [13]	2010	Retrospective	79	10	11	NR	NR	NR	NR	NR	NR	AVB
Levya et al. [14]	2016	Retrospective	18,402	14	10.8	63.5 ± 15	51.2	NR	NR	NR	Age, male sex, emergency admission, preexisting diabetes, renal impairment, heart failure, MVR, CABG	AVB
Tomsic et al. [15]	2018	Retrospective	83	7	8.43	56.6 ± 12.6	25	15.9	NR	NR	NR	AVB
Moskowitz et al. [16]	2019	Retrospective	14,686	1	4.5	64.92 ± 13.88	60.23	46.24	NR	NR	Age, Hx of arrhythmias, conduction disturbances, MVR + AVR	SA node dysfunction, High-degree AV block, Third degree AV block
DeRose et al. [17]	2019	RCT	243	1	14.4	70 ± 9.2	51.4	54.3	NR	NR	Age, AF ablation, multivalve surgery, NYHA class III/IV	SA node dysfunction, AVB
Herrmann et al. [18]	2021	Retrospective	797	8.77	10	Median (IQR) 70 (60 – 76)	41.4	NR	NR	NR	MVR, tricuspid ring annuloplasty, DM	AVB
Helmers et al. [19]	2021	Retrospective	1366	NR	7.75	Median (IQR) 66 (56 – 74)	43	NR	NR	NR	Age, prior MI, concomitant AVR/TVR, MVR, AF	AVB