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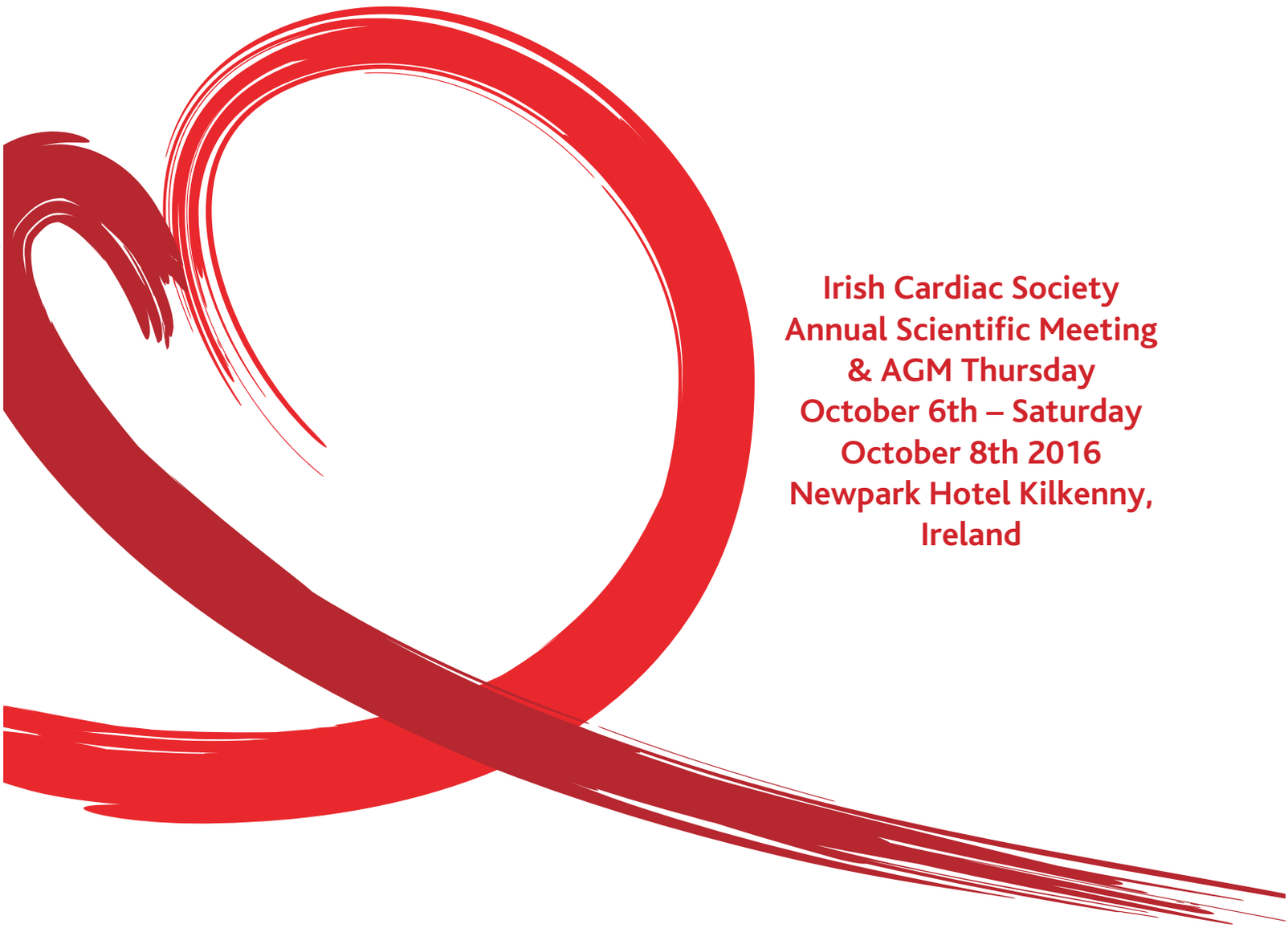
heart



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Oral Abstract Presentations 1

1 PERIPHERAL BLOOD NATRIURETIC PEPTIDE IS ASSOCIATED WITH MYOCARDIAL FIBROSIS AND CARDIAC TISSUE EXPRESSION OF NATRIURETIC PEPTIDE AND FIBRO-INFLAMMATORY GENES IN PATIENTS WITH NORMAL EJECTION FRACTION

[1]C Watson, [2]P Collier, [2]D Phelan, [1]N Glezeva, [1]J Baugh, [1]K McDonald, [1]M Ledwidge. *[1]School of Medicine University College Dublin, Ireland; [2]Cleveland Clinic, Ohio, USA*

10.1136/heartjnl-2016-310523.1

Introduction The St Vincent's Screening TO Prevent Heart Failure (STOP-HF) study showed that preclinical left ventricular diastolic dysfunction (PCDD) is more prevalent than left ventricular systolic function, that peripheral blood natriuretic peptide (NP) can be used to identify asymptomatic myocardial disease and that NP correlates with disease severity.

Methods We investigated peripheral blood biomarkers associated with PCDD and corresponding myocardial gene expression of the biomarkers in 35 consecutive, consenting stable patients with normal ejection fraction (EF > 45%) undergoing elective CABG surgery. Atrial tissue was obtained adjacent to the venous cannulation site and was stained for collagen using picosirus red and macrophage markers. Patients were categorised as PCDD or controls based on Doppler Echocardiography. Biomarkers and genes of interest included fibro-inflammatory genes, NP and its main transmembrane receptor Natriuretic Peptide Receptor A (NPRA).

Results Patients were aged 67.4 ± 9.8 years, 25 (69%) were male, 18 (53%) had hypertension and 5 (14%) had diabetes. Preclinical LVDD patients (n = 10) had greater tissue collagen volume fraction, E/Eprime (12.5 ± 2.6 vs. 8.4 ± 2.0), LAVI (30.6 ± 4.2 vs. 27.8 ± 3.4) and atrial fibrillation (70% vs 8%) than controls (all $p < 0.05$). PCDD was associated with increased myocardial gene expression of collagen 1, collagen 3, MMP2, TNFalpha, Thy1, LOX, Ferritin and RPCP. M2 Macrophage marker CD163 was strongly correlated with collagen 1 and 3 expression as well as myocardial expression of BNP and NPRA. BNP levels were significantly higher in preclinical LVDD patients (163 ± 147 vs. 57 ± 85, $p < 0.01$) but no other peripheral blood biomarkers of inflammation, collagen turnover or extracellular matrix turnover differed between the groups. BNP was the only blood biomarker that correlated with myocardial expression of the corresponding gene.

Conclusion PCDD is associated with elevated peripheral blood NP, myocardial fibrosis and altered expression of fibro-inflammatory genes in the myocardium. Unlike other markers of fibro-inflammation, peripheral blood NP was correlated with myocardial tissue expression of its corresponding gene and these data underline the value of peripheral blood NP in risk stratification in PCDD.

2 LIFESTYLE BEHAVIOUR OUTCOME IN HEART FAILURE PREVENTION PROGRAMME

[1]S James, [2]E Tallon, [2]D Connell, [3]E O'Connell, [1]M Wilkinson, [4]C Watson, [3]J Gallagher, [3]M Ledwidge, [1]K McDonald. *[1]St. Vincent's University Hospital, Dublin, Ireland; [2]STOP-HF Screening Service, St Michael's Hospital Dun Laoghaire, Co. Dublin, Ireland; [3]Heartbeat Trust, Crofton Terrace, Dun Laoghaire, Co. Dublin, Ireland; [4]Conway Institute University College Dublin, Ireland*

10.1136/heartjnl-2016-310523.2

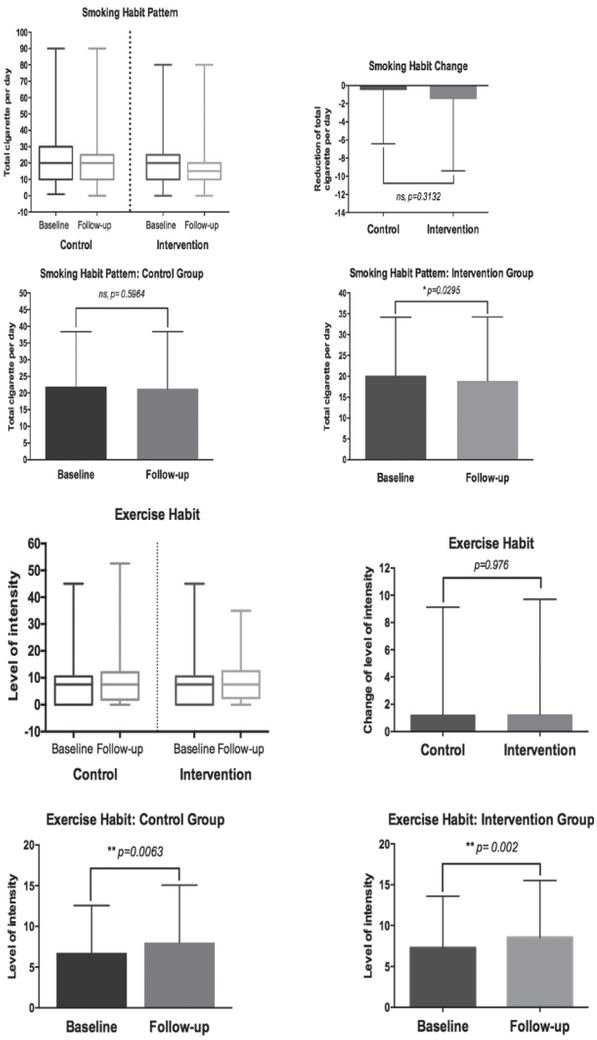
Introduction The St Vincent's Screening To Prevent Heart Failure (STOP-HF) Programme has shown to be clinical and cost effective. The use of RAAS modifying agents in part contributed to the reduction in the cardiovascular and heart failure endpoints. The impact of the strategy on lifestyle factors had not been fully examined. We aim to assess the lifestyle behaviour in the STOP-HF Programme.

Methods 739 at risk individuals attending the STOP-HF Programme were included. The characteristics, and lifestyle behaviour were recorded (Table 1). The lifestyle behaviour questionnaires were collected at two-time points, 2004 and 2010, included smoking, alcohol intake, salt intake, 30-minute walk, and exercise habits. The exercise habit was reported as intensity of exercise by multiplying the frequency with level of exercise. Frequency is determined as times in a week of minimum 20-minute exercise. Level of exercise is graded as 1 (mild), 1.5 (moderate) and 2.5 (strenuous).

Results The 30-minute walk habit change was not significant (−0.1466 ± 3.081 vs. 0.0842 ± 3.351). There were reduction of total alcohol intake/week in control arm (–2.041 ± 21.19) and intervention arm (−0.1277 ± 11.87), however not significant.

Abstract 2 Table 1 Population characteristics

	Control	Intervention
N	350	389
Age, med[IQR]	65.99	63.68
Male, n (%)	157 (44.86%)	213 (54.76%)
Diagnoses, (%)		
Hypertension	71.71	69.67
Ischaemic heart disease	33.72	36.25
Diabetes mellitus	13.71	13.11
Atrial fibrillation	10.57	12.85
Clinical measurements, med[IQR]		
BP, mmHG	144/80	143/82
BMI, kg/m^2	27	27
Abdominal girth, inch	38.5	39
Biomarker, med[IQR]		
BNP, pg/ml	21	22
Cholesterol, mmol/L	5	5
LDL, mmol/L	2.65	2.6
HDL, mmol/L	1.28	1.16



Abstract 2 Figure 1 Smoking and exercise habits in STOP-HF programme

Salt habit at table and during cooking also did not change significantly.

Conclusion Despite promising significant changes of reduction in smoking habit and increase in exercise intensity within each study arm, the between study arm changes are not significant. The alcohol intake, salt intake, and 30-minute walk habits did not change. These observations support the initial inference of RAAS modifying therapies role in the positive clinical outcome of STOP-HF Programme. These data should be use to guide focus on non-pharmacological strategies on heart failure.

3 ANALYSIS OF CARE PATHWAYS IN PATIENTS ADMITTED WITH ACUTE DECOMPENSATED HEART FAILURE (ADHF) SHOWS A MISSED OPPORTUNITY DURING THE PREHOSPITAL PERIOD TO MINIMISE THE RISK OF ADMISSION

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10.1136/heartjnl-2016-310523.3

Introduction Heart failure (ADHF) admission rates remain a major challenge. There is a paucity of data available relating to the pre-hospital phase of care prior to admission with ADHF. We aimed to achieve a more complete understanding of this period, which may allow for more effective pre-hospital intervention thereby preventing admission.

Method In an ongoing study analysing care pathways in patients admitted to St. Vincent's University Hospital with ADHF (de novo presentations, DN, and recurrent admitters, RA), focus was placed on the pre-hospital period to assess duration of symptoms, seeking of pre-hospital medical assessment, the nature of any intervention heart failure-directed (HFI) or otherwise and, in the case of RA, the effectiveness in reporting weight gain. This interim analysis includes 50 patients. Data was gathered from clinical patient surveys, conducted by a heart failure nurse specialist and completed by the patient and a designated family member.

Result Of a total of 50 patients, 30 (60%) were DN and 20 (40%) were RA. Median years since HF diagnosis for RA was 4.5 years. Median age was 72 years (69 for DN, 76 for RA). RA had a higher number of co-morbidities (4.5) compared to DN (3). More than 75% of patients in both groups reported a symptom duration of >3 days. Of RA, 90% (18) reported monitoring their weight and 72.22% (13 of 18) of those noted a weight gain of <2 kg over two days along with their symptoms. Of those who noted a weight gain, 76.92% (10 of 13) reported it to a doctor prior to admission. There was a high rate of patients seeking medical advice in the community (in a GP/HF/general cardiology clinic) prior to admission: 66.67% (20) of DN and 75% (15) of RA. Cardiology review (general or HF-specific) was more common in RA (50%, 10) compared to DN (3.33%, 1). 63.33% (19) of DN and 25% (5) of RA were reviewed by a GP only. Of the DN who were seen by a GP only, 15.79% (3 of 19) were prescribed an HFI (commencement of a diuretic or alteration of their established diuretic regimen), 31.58% (6 of 19) were prescribed another therapy (primarily antibiotics alone or with steroids) and in 52.63% (10 of 19) there was no intervention. Of the RA who were seen by a GP only, 0% (0 of 5) were prescribed an HFI, 20% (1 of 5) were prescribed another therapy and there was no intervention in 80% (4 of 5).

Conclusion Due to the prolonged duration of symptoms and the high rate of patients seeking medical advice in the community, there is both time and opportunity in which to implement a more effective HFI during the pre-hospital phase of care for patients presenting with ADHF. Improved patient education and improved recognition of HF features by GP's with streamlined access to outpatient specialist assistance may allow for earlier appropriately directed HFI, potentially reducing the risk of admission.

4

VALUE OF CONTRAST-ENHANCED CARDIOVASCULAR MAGNETIC RESONANCE (CMR) IN DETECTION OF ADDITIONAL ABNORMALITIES IN FAMILY MEMEBERS OF SUDDEN CARDIAC DEATH DUE TO CARDIOMYOPATHY

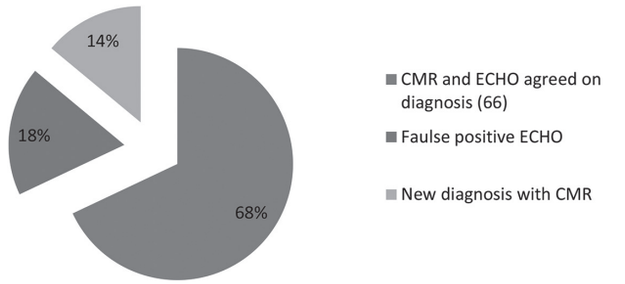
S Jadhav, D Ward, O Osuntokun, H Cooney, O Buckley, C Daly. *Tallaght Hospital, Dublin, Ireland*

10.1136/heartjnl-2016-310523.4

Introduction/background The prevalence of Sudden Cardiac Death (SCD) in the Irish people aged 15–35 years is estimated at 2.68 per 100,000/yr. Over 1/3 of SCD deaths are attributed to cardiomyopathies which are frequently inherited in an autosomal dominant pattern, meaning 1st degree relatives have a 50% chance of being affected. Population screening for these conditions is challenging due to low prevalence, genetic heterogeneity and variable penetrance, along with insensitive diagnostic tools. Conventional echocardiography is an accepted tool in screening, however sensitivity varies considerably. Gadolinium contrast cardiac MRI (gCMR) in this population has not previously been evaluated.

Hypotheses The addition of gCMR as standard evaluation of 1st degree relatives of SCD victims will aid in identification of affected relatives at an earlier stage and improve our ability to prevent further deaths.

Methods This is a single center observational study of first degree relatives of SCD victims due to Cardiomyopathy. Assessment compromised a history, family pedigree, electrocardiogram (ECG), ambulatory ECG monitoring (Holter), exercise testing (EST), 2-Dimensional Echocardiogram (ECHO), signal average ECG (SAECG), and gCMR. All results interpreted by experienced physicians, and where necessary expert opinion from relevant specialities was sought. Patients were excluded from the study if they were aged below 16 years, pregnant or breastfeeding, or had renal impairment GFR < 30 ml/min/1.73 m^2).

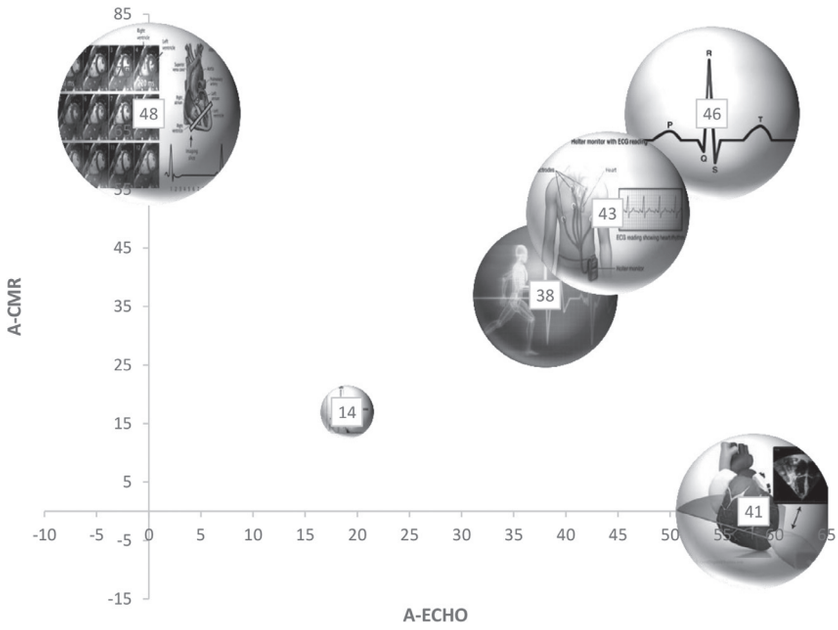


Abstract 4 Figure 1 CMR comparison with ECHO

Results 102 individuals were included.

41 had abnormal gCMR (A-gCMR). Of these 54% had only structural abnormalities and almost 1/3 had structural abnormality with fibrosis as demonstrated by late gadolinium enhancement (LGE). 6 individuals had fibrosis only – ie no other structural findings.

CMR and ECHO agreed on 68% of results.



	ECG	EST	Holter	SAECG	A-ECHO	A-CMR
A-ECHO	54	38	44	19	0	58
A-CMR	68	37	51	17	68	0
Total no. of abnormal results	46	38	43	14	48	41

Abstract 4 Figure 2 and Table 1 Comparison between CMR, ECHO and non-imaging routine cardiac tests

gCMR changed the diagnosis completely in 30 individuals.
gCMR identified a new diagnosis in 14% of individuals whose ECHO was reported as being normal. 38% of these new diagnoses were based on the identification of LGE.
gCMR was normal in 17% whose ECHO was reported to be abnormal (false positive ECHO) with most common issue being over-diagnosis of diastolic dysfunction.
A-gCMR positively correlated with abnormalities on the other non-imaging investigations compared with A-ECHO (an additional 14% had abnormal ECG and 7% had abnormalities on all 3 of ECG, EST and Holter).
Conclusion Addition of contrast enhanced CMR improves diagnostic accuracy and sensitivity compared to ECHO used in conventional screening in the 1st degree relatives of SCD due to Cardiomyopathy.
Acknowledgment The Research was funded by Meath foundation The Adelaide & Meath Hospital, Tallaght Dublin 24.

5 THE VALUE OF CALCIUM SCORING IN CHEST PAIN EVALUATION

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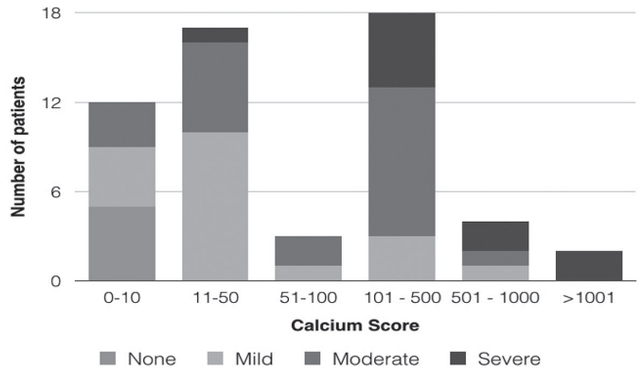
10.1136/heartjnl-2016-310523.5

Background NICE guidelines recommend CT calcium scoring as first line investigation for low risk chest pain followed by CT coronary angiography if the score is 1–400. The AHA and ESC guidelines however do not recommend the routine use of calcium scoring in chest pain evaluation. In our institution, most patients referred for CT investigation of chest pain or asymptomatic risk stratification have a CT calcium score (CAC) followed by a CT coronary angiogram (CTCA). The CONFIRM trial indicated a prevalence of 4.9% of coronary stenoses >50% in low risk symptomatic patients with a CAC score of zero.
Aims The aims of this study were: (1) to assess the diagnostic performance of CAC and (2) evaluate if there is any incremental benefit to routinely performing both CAC and CTCA, considering clinical yield and radiation exposure.
Methods The study period was 01/01/2012 to 31/12/2015. Inclusion criteria: (1) patients referred for evaluation of low to intermediate risk stable chest pain or (2) asymptomatic patients requiring cardiovascular risk stratification. Exclusion criteria: (1) CT scans performed to evaluate for anomalous coronaries, coronary bypass grafts or pulmonary venous anatomy pre ablation or (2) isolated CAC scoring performed without CTCA. The effective radiation dose was calculated for all scans in 2015.
Results 234 patients underwent a CAC score followed by a prospective ECG gated CTCA. Eighteen of these angiograms were significantly limited by motion or reconstruction artefact, rendering them nondiagnostic, and were excluded leaving 216 diagnostic scans in this study. The mean age was 49.5 years (range: 27–73 years). Forty seven percent (n = 101) were female. The mean CAC = 1 (range 0–1161). Seventy percent (n = 152) of patients had a CAC score = 0. Of the 152 patients with a CAC of 0, 18% (n = 28) were found to have mild atheroma on their CTCA. None had more significant disease. The diagnostic performance of CAC scoring over the four year period was calculated using CTCA as the standard. The negative predictive value of a CAC = 0 was 100%, while the positive predictive value of a CAC > 1 for greater than mild atheroma, was 70%. The sensitivity of CAC in our patient population was 100%, specificity 89%. There were no false negative results with a CAC = 0. The average total effective radiation dose of a combined CAC and CTCA was 3.3 mSv (range 1.6–6.5 mSv). The average effective radiation dose for a CAC score was 0.86 mSv (0.3–1.3 mSv) while the average for a CTCA was 2.2 mSv (0.8–4.8 mSv). On average, a CAC test accounts for 26% of the effective radiation exposure from the total investigation. There was a non linear relationship between CAC score and stenosis severity (Figure 1).



Abstract 5 Figure 1 Stenosis severity correlating with calcium score

Conclusions CAC scoring demonstrated excellent negative predictive value for significant coronary artery disease in low to intermediate risk patients. A negative calcium score did not exclude mild atheroma, but also did not produce any false negatives for significant stenoses. CAC scoring requires considerable radiation exposure.

Moderated Poster Abstracts 1

6 RISK-STRATIFYING BIOMARKERS TO PREDICT NEW ONSET HFPEF: POTENTIAL ROLES FOR BNP, HS-TROPONIN AND GALECTIN-3

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10.1136/heartjnl-2016-310523.6

Introduction The future prediction of new onset heart failure with preserved ejection fraction (HFpEF) is an important component of disease prevention strategies. HFpEF is characterised by progressive onset of cardiac remodelling and ventricular dysfunction providing opportunities to detect these disease manifestations earlier and therefore enabling timely intervention. Based on HFpEF pathogenesis, potential biomarker candidates in the future prediction of new onset HFpEF include natriuretic peptides, high sensitivity Troponins, and galectin-3. The purpose of this study was to investigate the utility of these biomarker candidates in predicting new onset HFpEF in asymptomatic, event free patients with CVD risk-factors.
Methods The study population consisted of 90 patients selected from within the longitudinal STOP-HF study (Ireland) which comprises asymptomatic patients with CVD risk factors. Thirty of these patients developed HFpEF over time, and were propensity matched 2:1 by age and sex to a cohort that did not develop HFpEF (n = 60) over a similar time period. BNP, hsTroponin I, and galectin-3 were quantified in all patients at two time points.

Median time between measurements was 1.2 years, and median time between follow-up measurement and future HFpEF event was 1.6 years.

Results Biomarker analysis of hsTroponin I and BNP at baseline and follow-up were statistically significant predictors of future new onset HFpEF, whereas galectin-3 at follow-up only was a significant predictor. A logistic regression model indicated that unadjusted biomarker combinations could significantly predict future HFpEF using both baseline (AUC 0.77 [0.68, 0.87]) and follow-up data (AUC 0.86 [0.79, 0.94]). NRI between adjusted models indicate that it is not necessary to take account of patient medications at 80% sensitivity.

A simple clinical prediction rule to approximate the probability of future HFpEF development within the next 1–2 years was developed. Low and high risk was determined using BNP and galectin-3, with hsTropinin I being required to differentiate the intermediates. Applying this rule to the follow-up dataset yields sensitivity and specificity values of 83% and 71%, respectively.

Discussion We provided evidence for the utility of BNP, hsTroponin I, and Galectin-3 in the prediction of future HFpEF in asymptomatic event-free populations with CVD risk-factors. Validation of our biomarker combination models and clinical prediction rule in an independent population is required.

7 ASSOCIATION BETWEEN LOW-DOSE ASPIRIN USE, MONOCYTE BIOMARKERS, MATRIX METALLOPROTEINASES AND OUTCOME IN HFPEF

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Introduction Most community heart failure patients present with preserved ejection fraction (HFpEF) associated with inflammation, monocytosis, endothelial dysfunction and platelet activation. We investigated the clinical relationship between low-dose aspirin and outcome in HFpEF and the effects of aspirin on monocyte function and cell-cell interactions in-vitro.

Methods In a retrospective analysis of HFPEF patients, we identified 150 patients taking low-dose (75 mg/day) aspirin and age/sex-matched HFPEF controls not taking aspirin over a 3 year follow-up period. From this cohort, we also studied HFPEF age/sex-matched patients (14 aspirin, 14 non-aspirin) using primary monocyte isolation, monocyte qPCR, serum matrix metalloproteinase (MMP) and inflammatory marker assays. Finally, primary monocytes were isolated from 6 healthy volunteers, analysed using flow cytometry for monocyte-platelet complexes, monocyte chemotaxis assays, and co-cultured with platelet releasate (PR, 16h) with and without aspirin.

Results Aspirin was associated with higher overall survival and lower HF hospitalisations over the 3-year follow up period (HR = 0.605, 95% confidence interval, 0.389–0.961). Serum MMP2 and sCD163 were significantly reduced in aspirin HFPEF versus matched HFPEF controls. The majority (88%) of donor monocytes were complexed with platelets. Monocyte incubation with PR caused cell activation, increased release of matrix metalloproteinas and MCP1 as well as increased monocyte invasiveness in an in-vitro transwell assay. Inflammatory cytokines (IL1alpha, IL1beta, CCL17) and gene expression of PSGL was reduced by aspirin as was monocyte invasion was reduced by 50% with aspirin treatment ($p < 0.01$).

Conclusion This retrospective study shows an association between the use of low-dose aspirin and better clinical outcome in HFpEF, associated with reduced sCD163 and circulating matrix metalloproteinase. These effects may be related to antiplatelet mediated modulation of monocyte function. Further work is required to evaluate antiplatelet strategies in HFpEF.

8 STANDARDS OF HEART FAILURE MANAGEMENT IN MEDICAL AND CARDIOLOGY WARDS 2014–2015

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Background The most recent National Heart Failure Audit (2013–2014) demonstrated that those patients in medical wards had lower levels of evidenced based therapy and higher levels of mortality. The aims of this audit were to assess management of heart failure in medical and cardiology wards against national guidance to determine standards of care in each and learning points for improvement in care.

Methods A random sample of patients admitted to both medicine and cardiology between Jan 2014 and June 2015 was obtained. A retrospective examination of online hospital records was performed and results compared with National Heart Failure Audit 2013–2014.

Results Overall, 100 patients sampled who were admitted medically and 149 patients sampled who were admitted to cardiology with heart failure during the study period.

Medical patients on average 10 years older than cardiology patients (80.7 ± 10.1 years versus 70.3 ± 12.9 years, $p < 0.001$) and were more likely to be female (57% vs 23%, $p < 0.001$). Overall 71% of medical and 99% of cardiology patients had had an ECHO in the year before or after admission, compared with 91% for national heart failure audit. There was a significantly higher portion of patients with moderate to severe LV systolic dysfunction admitted to cardiology (72% vs 28%, $p < 0.001$). Use of evidenced based therapy in this group and comparison with national audit standards is summarised in Table 1. Medical patients had a higher incidence of a subsidiary diagnosis, for example, sepsis, on discharge (76% vs 16%, $p < 0.001$), although length of stay was longer for cardiology patients (17.7 ± 14.7 days vs 7.5 ± 7.6 days, $p < 0.001$). Mortality is summarised in Table 2, and was significantly increased in medical patients, likely due to a combination of increased age and comorbid status, and reduced evidenced based therapy.

Abstract 8 Table 1 Evidence based therapy by diagnosis: moderate to severe LVSD

	Medicine (n = 28)	Cardiology (n = 108)	Level of significance	National Heart Failure Audit standard
ACEi/ARB (%)	14 (50.0)	95 (87.9)	<0.001	(85.0)
Beta blockers (%)	18 (64.2)	107 (99.1)	<0.001	(85.0)
Mineralocorticoid receptor anatagonists (%)	11 (39.3)	74 (68.5)	<0.001	(51.0)
Combination (%)	5 (17.9)	72 (66.7)	<0.001	(41.0)
Cardiac devices (%)	1 (3.57)	28 (25.9)	<0.001	(39.0)

Abstract 8 Table 2 Mortality

	Medicine (n = 100)	Cardiology (n = 149)	Level of significance	National Heart Failure Audit standard
Inpatient mortality (%)	7 (7.0)	3 (2.00)	0.052	(9.5)
30-day mortality (%)	11 (11.0)	1 (0.70)	<0.001	(6.2)
1-year mortality (%)	45 (45.0)	33 (22.1)	<0.001	(27.0)
Admission to death (median, IQR)	111 (35,236)	156 (90,224)	0.650	
Place of death (%)				
Hospital	35 (70.0)	21 (60.0)	0.234	
Home	15 (30.0)	14 (40.0)		

Conclusion Comparison of management of heart failure between medical and cardiology wards revealed two different patient groups in terms of; age and comorbid status and ECHO findings. Whilst cardiology patients compared well with national audit standards it appears that medical patients could benefit from greater heart failure team input.

9 A RETROSPECTIVE REVIEW OF THE OUTCOMES OF NON INVASIVE IMAGING WITH OFF-SITE CARDIAC MRI AND CORONARY CT ANGIOGRAPHY REFERRALS FROM THE ACUTE MEDICAL UNIT (AMU), BEAUMONT HOSPITAL

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Introduction Non invasive imaging with Cardiac MRI (CMRI) and Coronary CT Angiography (CCTA) is increasingly utilised in intermediate risk patients to evaluate for the presence of coronary artery disease (CAD). Positive scans identify target lesions prior to angiography; negative scans obviate the need for angiography, with potential economic benefits through reduced length of stay (LOS) and associated cost and complications related to invasive procedures.
Methods A retrospective analysis by chart review was conducted on referrals (n = 96) for CMRI and CCTA from AMU in 2015.
Results Following consultation with cardiology, 76 patients with no history of CAD were referred for CMRI (34 female, mean age 57.9 years, range 29–84). 42 patients had a normal CMRI and were discharged by the AMU service to their GP without need for cardiology OPD. 23/76 (30.2%) scans were positive for inducible ischaemia (11 outpatients) and referred on to cardiology. 11 have had formal angiography to date, with 4 requiring PCI. A further 12 scans identified unexpected abnormalities (6 cardiomyopathy/HOCM; 4 myocarditis; 2 cardiac sarcoid), not apparent on Echo. 6 patients that had abnormal Echos (LV dysfunction and Regional wall motion abnormalities) had subsequent normal CMRI, obviating the need for invasive angiography. 17 patients who had a high index of suspicion for CAD but normal ECHO, had subsequent positive CMRI. 53 patients had outpatient CMRI, average time to scan from discharge 43 days. Average LOS 3.9 days. 23 patients had an inpatient CMRI, with an average of 9 days to scan from admission, average LOS 15.1 days. 20 patients were referred for CCTA (11 female, mean age 51.4 years, range 41–71). These included: assessment of chest pain with negative troponins/normal echo/intermediate risk factors with equivocal EST, patients unable to perform EST and those unsuitable for CMRI (eg claustrophobia). All patients referred for CCTA were discharged for OPD scanning; average waiting time was 73 days (range 7 to 138 days). 7/20 scans (35%) were positive showing calcium scores ranging 2–1497 and 4 showed obstructive atherosclerosis. Patients with positive scans were older (59.1 years v 45.0 years). The 13 patients with negative scans were discharged to their GP by AMU, the other 7 referred to cardiology OPD.
Conclusions Non invasive imaging forpatients attending AMU had a positivity rate of 35% for CCTA and 30.2% for CMRI for CAD and other diagnoses not appreciated on initial assessment. Patients with normal imaging were discharged by AMU without need for cardiology follow up. Patients with positive imaging were referred for cardiology review. Early access to non-invasive imaging for patients presenting with chest pain and intermediate risk factors has great potential to streamline management, with potential for earlier discharges and reduced LOS, cost savings, reduced need for invasive angiography and prompt follow up in cardiology in selected cases.

10 VORTEX FORMATION TIME: A NOVEL DIFFERENTIATOR BETWEEN PHYSIOLOGICAL AND PATHOLOGICAL CARDIAC ADAPTATION

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Introduction Elite athletes undertake endurance training that can lead to increased left ventricular wall thickness thus creating uncertainty regarding the differential diagnosis of athlete's heart from hypertrophic cardiomyopathy (HCM). The distinction of physiological from pathological LV wall hypertrophy is crucial because of the risk of sudden cardiac death associated with HCM. Vortex formation time (VFT) is a novel index of biological fluid transport efficiency. It is a dimensionless index of the left ventricular filling that integrates all phases of diastole (T≈ 4 (3.3–5.5)). It has been shown to reliably differentiate between healthy control subjects and heart failure patients. We hypothesised that VFT can be used to differentiate between physiological and pathological cardiac adaptation, especially in this challenging population of "athletes heart" versus mild hypertrophic cardiomyopathy.
Methods We compared echocardiographic indices between 41 elite male strength endurance athletes with mild symmetrical LVH, 11 male patients with a mild phenotype of hypertrophic cardiomyopathy against 20 sedentary volunteers (age, weight and sex-matched). VFT was obtained using the validated formula: $4 \times (1 - \beta)/\pi \times \alpha^3 \times$ LVEF, wheris the fraction of total transmitral diastolic stroke volume contributed by atrial contraction and α is the biplane end-diastolic volume $(EDV)^{1/3}$ divided by mitral annular diameter during early diastole. Multiple regression analysis was used to adjust for heart rate and age.
Results There was no difference in gender and body surface area between the controls, athletes and hypertrophic cardiomyopathic patients. Septal wall thickness was 1.4 cm ± 0.1 in the HCM group compared to 1.3 cm ± 0.1 in the athletes and 0.89 cm ± 0.2 in the controls. The heart rate was 63 ± 10 bpm in the athletes vs. 74 ± 7 bpm in sedentary controls and 81 ± 4 bpm in HCM group (p = 0.001). The VFT was highest in the athletic

group, lower in the sedentary group and lowest in the HCM group (4.01 ± 0. 80 vs. 3.12 ± 0.38 vs. 2.5 ± 0.8) ($p < 0.001$).
Conclusion The VFT was normal in endurance Rowers and controls but significantly reduced below the optimal value in the hypertrophic cardiomyopathy patients. We conclude that pathological left ventricular hypertrophy (LVH) can be differentiated from physiological LVH by the presence of decreased Vortex formation time. Vortex formation time is a new useful differentiator between pathological and physiological LVH to guide physicians decision making in this challenging population.

11 CONSCIOUS SEDATION AS THE DEFAULT ANAESTHETIC APPROACH FOR TRANSCATHETER AORTIC VALVE INSERTION (TAVI)

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Aim TAVI has traditionally been performed under general anaesthetic (GA), as there is no consensus on anaesthetic management. Our default has been to perform TAVI under conscious sedation (CS) for non-surgical access, since the inception of our program. We sought to determine the efficacy, safety and cost savings of this approach.
Methods We reviewed our program at St James's Hospital and Blackrock Clinic, Dublin from commencement in September 2008 to December 2014. Mean EURO II score, 30 day and one year mortality; cerebrovascular complications, vascular and major bleeding complications (drop in Hb > 2 g/dl), acute kidney injury (AKI) and length of stay were compared between GA and CS groups.
Results TAVI was undertaken on 145 patients. 13 patients had a primary surgical access and were excluded from our analysis. 132 patients underwent TAVI implantation via a non-surgical approach; 27/132 (20%) under GA and 105/132 (80%) under CS.
Table 1 highlights the demographic data and procedural outcomes.
CS was associated with a significantly shorter length of stay and incidence of acute kidney injury. The estimated hospital cost of 1000 euro per night per patient means that the shorter length of stay for CS generated significant cost savings compared to GA.
Conclusion TAVI using conscious sedation is associated with a much shorter post procedural hospital stay, significant cost savings and similar procedural success. Conscious sedation should be the default anaesthetic approach for non-surgical access.

Abstract 11 Table 1 Characteristics

Characteristic	CS	GA	P value
Age (years)	82 ± 4.8	83 ± 4.4	0.2
EURO II score	9.1 ± 0.6	9.7 ± 0.9	0.6
Length of stay (days)	7.5 ± 8.1	15.4 ± 37	0.01
30 day mortality	10%	12%	0.9
1 year mortality	17%	21%	0.6
Vascular complications	9%	14%	0.2
Major Bleeding	13%	15%	0.7
Stroke	4%	6%	0.8
Pacing rate at 30 days	14%	17%	0.6
Acute kidney injury	5.1%	18%	0.01
Procedural success	97.6%	97. 9%	0.7

General Poster Session 1

12 DIFFERENCES BETWEEN OVERWEIGHT/OBESE PATIENTS AND NORMAL WEIGHT PATIENTS WITH STABLE HEART FAILURE. A POSSIBLE LINK TO SURVIVAL BENEFIT

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Background Chronic heart failure (CHF) patients with increased body mass index (BMI) (overweight and obese) have better survival rates than their normal weight counterparts. There is no clear consensus about what factors-related to increased BMI underlie this benefit hence more studies are encouraged.
Objective We aimed to assess how body composition, diet, exercise levels and functional capacity differed between obese/overweight and normal weight patients.
Methods 106 patients with chronic stable heart failure were categorised according to their BMI. Anthropometric measurements, body composition (Tanita), fat mass and free Fat mass, dietary 3 day records and functional assessments including 6 minute walk test, 3 day FitBit records and NYHA class were recorded (Table 1).
Results There were no differences in daily energy, fat, or carbohydrate consumption or activity levels between the groups. However, overweight and obese CHF patients have significantly increased fat mass, % fat, free fat mass and consumed more protein. Mean age 66.8 ± 12.7. 72.2% (n = 78) were male and 27.8% (n = 30) were female.
Conclusion Our study highlights that energy intake and activity levels do not differ significantly between overweight/obese and

Abstract 12 Table 1 Comparisons

	Normal weight	Overweight	Obese	*p*-value
No. pts (n)	23	38	45	
Age (years ± SD)	67.1 ± 2.7	67.9 ± 2.1	65.8 ± 1.9	0.716
Fat Mass	15.7 ± 1.3	24.2 ± 1.5	37.4 ± 0.97	≤0.0001†
Free Fat Mass	47.0 ± 2.0	57.0 ± 1.5	59.9 ± 1.4	≤0.0001†
% Body Fat	24.8 ± 1.5	30.1 ± 1.1	38.4 ± 1.0	≤0.0001†
Waist circumference(cm)	84.0 ± 1.8	97.7 ± 1.4	110.5 ± 1.3	≤0.0001†
Functional Measurements				
NHYA	1.25 ± 0.11	1.33 ± 0.09	1.27 ± 0.08	0.840
6 min walk (m)	394.0 ± 31.0	403.6 ± 24.7	387.6 ± 22.7	0.889
Activity (Mean no. of steps per day)	5120.1 ± 924.8	5839 ± 713.1	5564 ± 661.5n	0.819
Mean Daily Dietary Intake				
Energy (kcal)	1641.1 ± 108.3	1716.1 ± 87.2	1844.0 ± 81.3	0.292
Proteins(g)	69.3 ± 4.9	76.4 ± 3.9	85.3 ± 3.6	0.03†
Fat(g)	66.4 ± 5.7	66.3 ± 4.6	74.1 ± 4.3	0.384
Carbohydrates (g)	196.5 ± 13.7	206.2 ± 11.0	204.4 ± 10.3	0.292

NB: NYHA stand for New York Heart Association

normal weight patients. However, the higher fat free mass and protein intake suggests differences in protein metabolism may be relevant to the survival benefit with higher BMI.

13 AUDIT OF THYROID AND LIVER FUNCTION TESTING IN PATIENTS WITH HEART FAILURE ON CHRONIC AMIODARONE THERAPY – ARE WE TESTING APPROPRIATELY?

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Introduction Thyrotoxicosis, acute and chronic liver injuries and to a lesser extent, hypothyroidism are well-recognised side effects of amiodarone. It is therefore recommended that patients who take amiodarone should have thyroid function (TFT) and liver function (LFT) tested at six monthly intervals. The aim of this audit is to assess the frequency of thyroid and liver function testing carried out by the Supportive Heart Unit in Beaumont Hospital on their patients taking amiodarone.

Methods A retrospective review of the case notes of all patients on amiodarone seen in the Supportive Heart Unit between December 2015 and April 2016 was undertaken. Blood results for these patients were reviewed to ascertain the frequency with which TFTs and LFTs were checked. Only patients who had been on amiodarone for more than one year were included. Only bloods taken on an outpatient basis were considered. Where patients had more than the required number of tests per year, notes were reviewed to ascertain the reason for the increased frequency of testing. These were then categorised as appropriately or inappropriately increased frequency of testing.

Results A total of 40 suitable patients attended the Heart Support Unit between December 2015 and April 2016. The indication for amiodarone was rhythm control of atrial fibrillation in 67.5% and management of ventricular arrhythmias in 32.5%. The mean number of TFTs over the monitoring period was 3.775 (SD 1.69) per patient. 29 patients (72.5%) had more than 2 sets of TFTs taken in the last year. Of these, 10 (25% of total) were deemed to have no clinical reason for the increased frequency of testing and therefore were inappropriate. 9 patients (22.5%) had the recommended number (2) of TFTs in the last year. 2 patients (5%) had only one TFT check during the monitoring period. The mean number of LFTs during the monitoring period was 5.35 (SD 1.35) per patient. 4 patients (10%) had the appropriate number of LFT checks (2) in the last year. 36 patients (90%) had more than the recommended two LFT checks. 19 of these (47.5% of total) had no clinical reason for the increased frequency of testing and therefore were inappropriate. 1 patient (2.5%) had less than 2 LFT checks during the monitoring period.

Conclusions Our results show that most patients are having both their LFTs and TFTs checked a minimum of twice per year. Only two patients did not have the desired number of TFTs in the last year and one did not have the desired number of LFTs. This demonstrates that there is good knowledge among the Heart Support Unit nurses regarding the need for close monitoring of these parameters in patients taking amiodarone. Our results also demonstrate that there is a potential cost saving to be made from patients who are having excessive TFT and LFT testing. Our plan is to alter the standard patient form in the Heart Support Unit to include a reminder to check TFTs and LFTs at the desired frequency and re-audit in June 2017.

14 MYOCARDIAL DYSFUNCTION IN ANCA VASCULITIS MEASURED BY TWO-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY

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Aim Myocardial involvement in patients with systemic vasculitis portends a poorer prognosis. We sought to determine the extent of myocardial dysfunction in Granulomatosis with polyangitis and Churg Strauss disease using speckle tracking and strain imaging.

Methods 20 patients and 22 controls with no prior cardiac history were recruited from December 2015 to April 2016. Baseline demographics recorded included age, sex, cardiovascular risk factors, time since diagnosis, immunosuppressive therapy and vasculitis damage index score (VDI). We performed transthoracic echocardiography using Vivid 7 GE machine along with twelve lead electrocardiograms (ECG) and biochemical analysis at the study visit. A single blinded operator utilising Echo Pac 11 software performed offline analysis of strain and speckle tracking measurements.

Results Mean age of the vasculitis group was 56 ± 10 years with 50% being male, while mean age of controls was 53 ± 9 years with 55% male. There were no significant differences between groups in age, incidence of hypertension ($p = 0.3$) or diabetes ($p = 0.6$). Radial strain was significantly reduced in the vasculitis cohort ($P = 0.05$). The vasculitis cohort also showed a non-significant reduction in longitudinal strain and abnormal diastology as reflected in a reduction in tissue Doppler E' velocities, decreased transmittal E/A ratio and increased E/E' ratio when compared to controls (Table 1).

There were negative correlations between increasing VDI score and reduction in mitral inflow velocities $r = -0.5$ ($p = 0.02$), number of clinical relapses and tissue Doppler E' $r = -0.6$ ($p = 0.009$) and length of cyclophosphamide use with tissue Doppler E' $r = -0.5$ ($p = 0.02$).

Conclusion This is one of the largest studies investigating myocardial dysfunction in ANCA positive vasculitis. Patients demon-

Abstract 14 Table 1 Echocardiographic data

Measurement	Control	ANCA positive group	P Value
Ejection Fraction (Simpsons)	71 ± 7	70 ± 7	0.8
Mitral Inflow E/A (m/s)	1.2 ± 0.43	1.1 ± 0.44	0.4
Tissue Doppler E' (cm/s)	12.6 ± 3.9	11.5 ± 2.9	0.2
E/E'	6.0 ± 1	6.5 ± 2.0	0.4
Peak Radial Strain (% change)	54 ± 17.7	42.5 ± 17.8	0.05
Peak longitudinal strain (% change)	20.5 ± 3.8	18.9 ± 3.2	0.1

strated a reduction in radial strain and evidence of abnormal left ventricular relaxation. This may be indicative of underlying cardiac involvement.

15 ELEVATED TROPONINS AND NORMAL CORONARY ANGIOGRAM

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Introduction Elevated Cardiac enzymes are associated with high morbidity and mortality. A significant subset of patients referred to the cardiac service has raised troponin levels and normal coronary angiography. This subset is distinctive from patients with type 2 myocardial infarction (MI). It includes patients with no active medical conditions who present with clinical and electrocardiographic features similar to that of acute coronary syndrome. In this report we describe a cohort of patients, in whom the diagnosis of type 1 myocardial infarction was very likely, but subsequently had normal angiogram.

Purpose of study The aim of the study is to identify a diagnostic approach for patients who display features of MI with no evidence of obstructive coronary artery pathology.

Methods The study included all patients with suspected with MI (STEMI or NSTEMI) with raised troponin, abnormal ECG and normal coronary angiography who attended the PCI centre at the University Hospital Limerick between September 2015 to January 2016. All patients received the standard diagnostic pathway of acute coronary syndrome. Data collected included baseline characteristics, ECG on presentation, laboratory profile, Grace score, cardiac imaging results, recurrence of symptoms and hospital readmission over 3–6 months period. All patients included in this study had normal coronary angiogram.

Result A total of 26 patients included in this study, 13 (50%) patients were men and the mean age was 51 years old. 6.7 (26.9%) patients presented as STEMI while 19 (73.0%) patients had ST segment depression on presenting ECG. Mean troponin level on admission was 285.9 ng/dl with mean Grace score of 100.04. 69% of the patients had normal EF on Echocardiogram and 11 (42%) patients had cardiac MRI (CMR) and one patient under went optical coherence tomography (OCT) during coronary angiography.

Confirmed diagnosis post-appropriate investigations included acute myocarditis (34.6%), acute myocardial ischemia on CMR (15.3%), Takotsubo syndrome (7.6%), pulmonary embolus (3.8%), Hypertrophic cardiomyopathy (11.5%) and severe aortic stenosis (3.8%). 4 (15.3%) patients had recurrent hospital admission with similar presentation while 84% had experienced no further symptoms or hospital admission.

Conclusion Establishing a definitive diagnosis in patients with raised troponin and normal coronary angiogram is challenging, but using imaging modalities such as CMR and OCT provides a valuable insight to guide diagnosis and management.

Acute myocarditis is the most common cause of raised troponin and normal angiogram in this cohort.

16 HOSPITALISATION WITH ACUTE HEART FAILURE: THE PATIENT'S VIEW: RESULTS FROM A QUALITATIVE STUDY OF THE ACUTE HEART FAILURE PATHWAY

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Unplanned ED visits and admissions are expensive for healthcare systems and often stressful for the patient and family. To improve the use of healthcare resources and the patient experience of care the Global Heart Failure Awareness Programme (HFA of the ESC) emphasises increasing public awareness of the common symptoms of heart failure (HF) and empowering and supporting those with HF to actively engage in their care. This study explored the experiences of patients and GPs. Patients were recruited following an unplanned HF admission to Hospital. The established HF Unit provides monitoring, optimises therapies and provides patient education for 3 months post discharge. We also interviewed General Practitioners (GPs). Data were collected by semi-structured interview and analysed using an inductive, thematic process involving constant comparison.

Twenty-four patients were recruited: Mean age of 81 years: 12 (50%) > 80 years: 10 (41%) > 85 years: Male 15 (63%), 9 (37%) de-novo HF, 17 (71%) had more than 3 co-morbidities and 8 (33%) > 3 non-cardiovascular co-morbidities. 11 (46%) lived alone. 6/15 patients with an existing diagnosis of HF had >3 admissions in the past 12 months. Seven GPs took part in the study.

Key themes

Understanding of HF Patients had a limited understanding of HF. They interpreted their symptoms as related to co-morbid conditions or age: breathlessness due to lung disease: fatigue due to older age. These symptoms did not fit with patient's views of HF (palpitations or chest pain) or their view of the type of person who developed HF (sedentary lifestyle). This understanding appeared derived from a general knowledge of heart disease portrayed in the media.

Continuity of care Patients described a close relationship with their GP that developed from regular monitoring related to comorbidities, on-going medication review, geographical proximity and ease of access. They viewed the GP as a 'trusted' source of knowledge. The majority turned to the GP when they sought resolution for symptoms. Following hospital discharge the HFU scheduled face-to-face and telephone follow-up. Patients appreciated the regular contact and were reassured by their monitoring.

Fragmentation of care GP's described barriers to obtaining diagnostic tests. This left them unable to give patients a formal diagnosis or start conversations about HF. Patients described limited access to the HFU for support or information. Some experienced frustration as they attempted to navigate between systems: HFU, GP and ED.

Patients in this study were elderly. They had multiple co-morbidities that led to a reliance on the GP. Their limited knowledge of HF resulted in them identifying HF symptoms as related to co-morbid conditions. Fragmentation of care between primary and

secondary care were barriers to prompt treatment and to provision of on-going information and supportive resources. These factors contributed to unplanned hospital admission and provided a negative experience of care. These results are now being tested in a larger population and different healthcare organisation.

17 REDUCTION IN LEFT VENTRICULAR MYOCARDIAL FUNCTION IN LONG-TERM PAEDIATRIC NEUROBLASTOMA SURVIVORS

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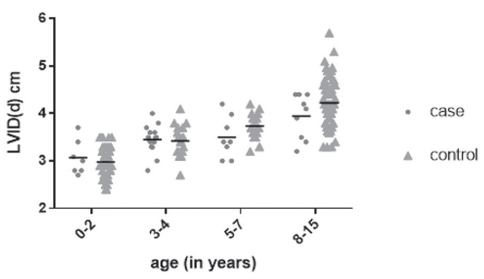
Background There are little data on the incidence of chemotherapy-induced myocardial dysfunction in long-term survivors of high-risk (HR) neuroblastoma. Our aim was to investigate the incidence of myocardial dysfunction in patients with high-risk (HR) neuroblastoma.

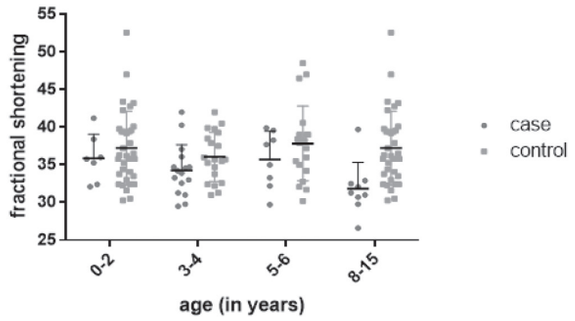
Method We performed a retrospective case-control study between 2003 and 2012 of HR NBL patients treated according to the SIOPEN HR-NBL clinical trial at Our Lady's Children's Hospital, Dublin. Inclusion criteria were patients enrolled on the trial with an echocardiogram prior to commencement of chemotherapy and a subsequent echocardiogram on follow-up. Comparative echocardiograms were obtained on age-matched healthy controls.

Results 36 patients met inclusion criteria. 53% were male (n = 18). All patients received rapid COJEC induction, 83% received busulfan/melphalan (n = 30) and 61% topotecan (n = 22). 21/40 Over half received doxorubicin (n = 21). Most recent echocardiography follow-up was an average of 22 months from initial study. There was no difference in fractional shortening (FS) pre- and post-treatment (36% and 34%) (p = 0.13). Last measured FS in survivors and non-survivors (33% and 35%, respectively) was not significantly different (p = 0.18). FS in older survivors (aged 8–15) reached significance when compared to controls (p = 0.0037). There was also a significant difference between cases and age-matched controls when divided into quartiles by time since diagnosis (p = 0.079, p = 0.01, p = 0.07, p = 0.04, respectively). There was no dilation in left heart internal diameter at end diastole at any age between cases and controls.

Conclusion Reduction in left ventricular fractional shortening is seen in older patients treated for HR neuroblastoma and this finding holds true when corrected for time since diagnosis. The mechanism of ventricular dysfunction is not due to progressive dilated cardiomyopathy, as indicated by preserved left ventricular internal diameters in diastole between cases and controls. Further study is warranted.



Abstract 17 Figure 1 Left end diastolic dimension in patients with neuroblastoma



Abstract 17 Figure 2 Systolic function in patients with neuroblastoma

18 HIGHER MORTALITY IN NORMAL WEIGHT HEART FAILURE PATIENTS IS UNEXPLAINED BY DIFFERENCES IN GENDER, AGE, VENTRICULAR FUNCTION OR DRUG TREATMENT

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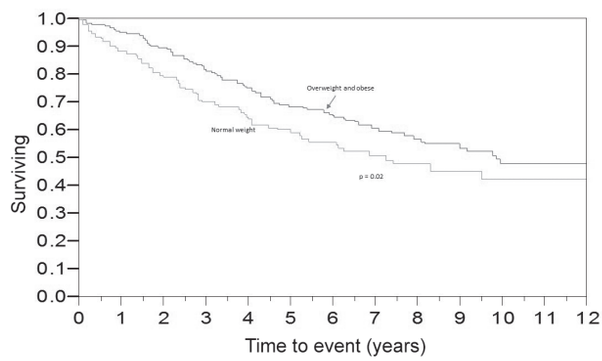
10.1136/heartjnl-2016-310523.18

Background Despite lack of strong evidence that weight loss in patients with chronic heart failure result in overall improved survival, the current guidelines still recommend loss of weight loss in patients with increased adiposity. Mortality is higher in normal weight patients with chronic heart failure (CHF) compared to their overweight and obese counterparts. It is still unknown if conventional risk factors account for this mortality difference.

Purpose We investigated if age, gender, cardiomyopathy type, left ventricular dimensions or function, functional capacity, or drugs used could explain this mortality differences in relation to euvolaemic body mass index (BMI).

Methods Retrospective review of 329 patients followed in the HF programme over the last 12 years. Patient data was recorded when they were stabilised on appropriate treatment.

Results In this long term follow up study mortality was higher in patients with normal weight compared to overweight and obese



Abstract 18 Figure 1

Abstract 18 Table 1 Risks of all cause of mortality in HF

	No. of Pts	Male	Age (yrs)	DCM (%)	NYHA	LViDd (cm)	LVEF (%)
Normal	124	72%	66.1 ± 13.0	46	1.80 ± 0.06	6.7 ± 0.3	30.0 ± 12.9
Overweight/ Obese	205	75%	64.2 ± 13.0	50	1.70 ± 0.05	6.5 ± 0.4	32.8 ± 12.9
Significance (*p*-value)	<0.001	0.238	0.105	0.728	0.117	0.149	0.067

patients. This differences was unexplained by differences in age, gender, disease type, ventricular size or function. Patients with increased BMI were more hypertensive ($p < 0.001$) and had higher prevalence of dyslipidaemia ($p = 0.031$). In addition, no significant differences in treatment or weight during follow up were observed. See Table 1 and Figure 1 which show risks of All-cause of mortality and survival curves respectively.

Conclusion Our data highlights that having a lower BMI has adverse effect on survival in patients with HF. However, there was no obvious risk factors that could account for this mortality differences. Future studies need to examine which specific obesity related factors reduce their mortality risk.

19 THE PREVALENCE OF ELEVATED NATRIURETIC PEPTIDE IN A DIABETIC POPULATION WITHOUT A HISTORY OF HEART FAILURE

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10.1136/heartjnl-2016-310523.19

Purpose Patients with diabetes are at increased risk of several cardiovascular disorders including heart failure. The objective of this study is to determine the prevalence of elevated natriuretic peptide (NP) in a diabetic population, characterise diabetics with normal and elevated NP levels, and examine the association between NP and heart failure in this population to allow appropriate structuring of heart failure prevention services.

Methods Patients enrolled in the HSE Midland Diabetes Structured Care Programme between May 2013 and Feb 2015 were included in this study. We measured the NP level of all participants and examined the characteristics of those with normal and elevated NP levels. We also determined the presence of heart failure in the elevated NP group using specific echocardiographic parameters (Table 1).

Results There were 611 patients with diabetes who had an NTproBNP level measured (58.6 % male, mean age 65.6 yrs). Two hundred and six patients (33.7%) had an NP level >125 pg/ml. Those with an elevated NP (>125 pg/ml) had higher rates of atrial fibrillation (18% vs 0.74%), HTN (51.5% vs 32.1%) and hyperlipidaemia (35.9% vs 25.4%) compared with the normal NP group. The use of Angiotensin receptor blockers (27% vs 18.9%), loop diuretics (25.8% vs 3.9%) and B blockers (50% vs 16.8%) was higher in the elevated NP group.

The rate of hypoglycaemic medication use between the two groups was higher in the normal NP group (63.2 vs 54.5%). Thiazolidenedione use was higher in the high NP group (7.9% vs 3.9%).The median HbA1C level was 47 (42–55) with no significant difference between the groups. Baseline echocardiography was performed in 170 patients. Twenty patients (11.7%) had LV systolic dysfunction (LVSD, EF <50%) and 68 (49.6%) had LV diastolic dysfunction (LVDD, LAVI >34). An NP level >250 pg/ml was most predictive of the presence of LV dysfunction (LVSD 16.9%, LVDD 64.2%).

Abstract 19 Table 1 NT measurements

	NTproBNP <125 n = 17	NTproBNP 125–250 n = 33	NTproBNP >250 n = 120
Relative wall thickness >0.42	7 (41.2%)	13 (39.4%)	56 (47.1%)
E/e ratio >13	2 (12.5%)	5 (20%)	28 (30.4%)
Lateral e velocity <10	10 (62.5%)	26 (89.7%)	77 (75.5%)
LVEF	17 (100%)	30 (90.9%)	101 (84.2%)
>55%	–	1 (3%)	8 (6.7%)
45–55%	–	2 (6.1%)	6 (5%)
35–45%	–		5 (4.2%)
<35%			
LAVI >34	4 (23.5%)	3 (12%)	61 (64.2%)

Conclusions Diabetic patients had a high prevalence of elevated NP. There was a high prevalence of LV dysfunction in those with elevated NP. Interval NP screening of this at risk population should be considered as part of the approach in reducing cardiovascular morbidity.

20 AUDIT ON THE USE OF ENDOMYOCARDIAL BIOPSY FOR DIAGNOSIS OF NON-TRANSPLANT RELATED CARDIAC CONDITIONS: SINGLE CENTRE EXPERIENCE

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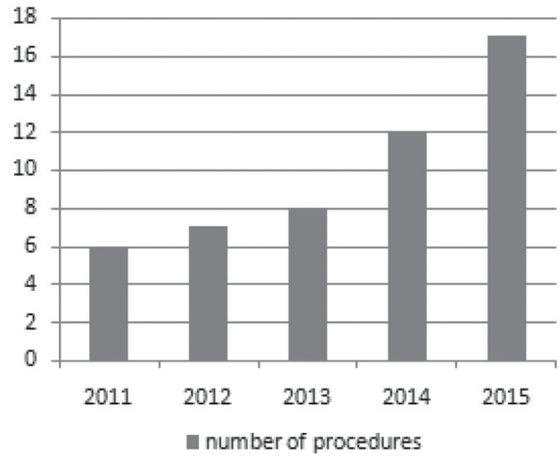
10.1136/heartjnl-2016-310523.20

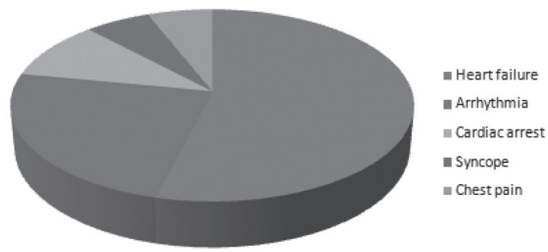
Background Endomyocardial biopsy (EMB) is an important tool, used in the diagnosis of a wide variety of cardiac conditions. While its role in the surveillance of post-cardiac transplant population is well recognised, its use in the diagnosis of non-transplant related cardiac conditions have not been adequately reported. We report a single centre experience of EMB for non-transplant related indications over a 5 year period.

Results A total of 50 EMBs were performed between January 2011 and December 2015.There has been a steady increase in the number of procedures performed during the observed period (Figure 1). The average age for patients undergoing EMB was 56.7 ± 15.1 years, with a significant majority being male (n = 39, 78%). Furthermore, majority of patients requiring EMB presented with symptoms of heart failure (Figure 2). Both femoral and internal jugular veins were used for access with the femoral route being more common (n = 46, 92%).Coronary angiography was performed in 40 (80%) patients.

There was no significant difference in the average age between patients who underwent coronary angiography and who did not undergo angiography (56 ± 13.9 vs 59 ± 19.9, p = 0.558). Of the 40 patients who underwent coronary angiography, 11 (27.5%) underwent follow-on EMB. Likewise, cardiac MRI was performed in 40 (80%) patients. In all except one patient, cardiac MRI was performed prior to the EMB procedure. No procedural complications (procedure related mortality, requirement of pericardiocentesis or access related complications) were noted in any of the patients who underwent EMB. EMB provided diagnosis in



Abstract 20 Figure 1 Number of procedures



Abstract 20 Figure 2

14 (28%) cases (Amyloidosis: 10, Lymphocytic myocarditis: 3, Sarcoidosis: 1). Out of the 10 cases of amyloidosis 2 were confirmed only following electron microscopic analysis. Cardiac MRI was indicative of amyloidosis in 8 of the 10 cases. However, it is also important to note that exclusion of specific pathological processes proved important in the management of these patients.
Conclusion Our findings demonstrate that the use of EMB for the diagnosis of non-transplant related cardiac conditions is increasing. Our experience demonstrates that the risk of procedural complication is low with none observed during the concerned period.

21 COMMUNICATION DIFFICULTIES IN THE CARE PATHWAY OF PATIENTS ADMITTED TO HOSPITAL WITH ACUTE DECOMPENSATED HEART FAILURE

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10.1136/heartjnl-2016-310523.21

Effective management of any chronic illness requires effective communication between all involved in delivering and receiving care. Central to this is effective inter-personnel communication and access to medical records. Heart failure (HF) care in particular demands good communication given the complexity of the illness and the tendency towards poly pharmacy.
Method In an ongoing study defining the care pathways of patients admitted with ADHF (Acute decompensated HF) (de novo presentations, DN; and known HF patients, KHF) we assessed specific features of communication along the care pathway: availability of HF records on Emergency Department (ED) presentation and clinically stable natriuretic peptide (NP) level and weight record for KHF patients. Confirmation of self-care education of DN patients was also assessed, as was education of DN relative or carer, including frequency of sessions for both. In addition, availability of medication lists on presentation, and confirmation of discharge information communications to GP and community pharmacist for all patients, were examined.
Population Eighty eight patients admitted to hospital with ADHF: 52.2% (46) DN, 47.7% (42) KHF, mean age 76 years, with a mean of 5 co-morbidities.
Results Of 88 patients followed 21 bypassed the ED. Of the 67 who attended the ED 43.2% (28) were KHF. HF records were available for 39.2% (11); NP during clinical stability was available for 28.5% (8) KHF, no NP on record for DN. Weight records were available for 21.4% (6) of known patients. Medication lists were available in ED for 38.8% (26) of all patients; Eighty-eight% (37) of the DN patients received education; of these 29.7% (11) received 1 session and 70.27% (26) received 1–3 sessions. 35% (15) relatives or carers received education with 46.6% (7) receiving 1 session and 53.3% (8) receiving 1–3 sessions. No prescriptions were faxed to community pharmacists, and 73.75% (59) patients discharged had letters sent to GP.
Conclusion This data highlights the communication difficulties present at various points in the care pathway of patients admitted to hospital with ADHF. Improved data access and inter-individual communication is necessary system-wide, to optimise management of HF patients.

22 INCIDENCE AND PREDICTORS OF PERMANENT PACEMAKER INSERTION AFTER PERCEVAL SUTURELESS AORTIC VALVE IMPLANTATION – A RETROSPECTIVE SINGLE-CENTRE STUDY

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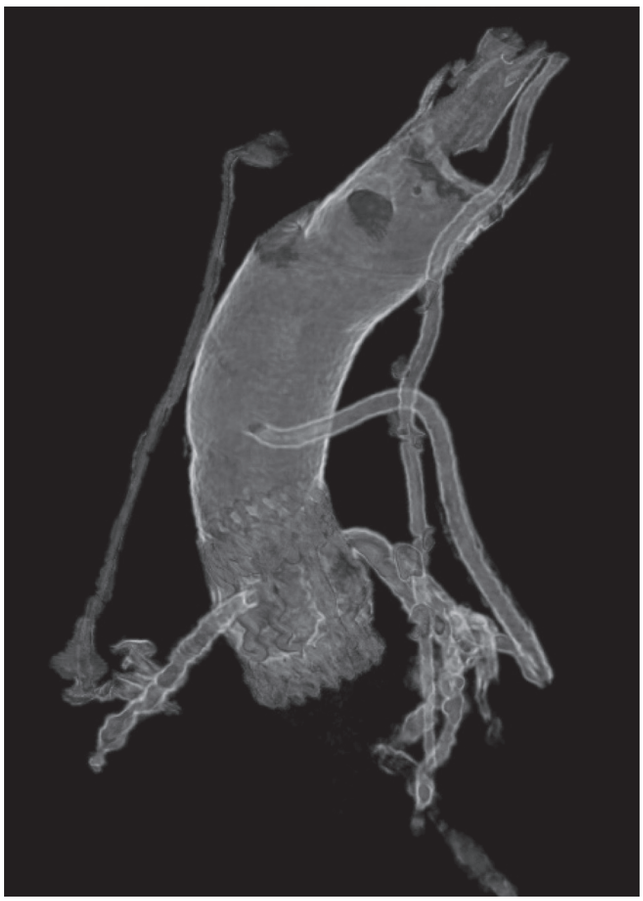
10.1136/heartjnl-2016-310523.22

Background Sutureless aortic valve replacement surgery (SAVR) is considered in patients with aortic stenosis who would benefit from reduced cross clamp time, such as elderly and high-risk patients. It serves as an alternative surgical approach to standard surgical AVR and TAVI (Figure 1).
Objective The purpose of this study was to evaluate the incidence of PM implantation following sutureless aortic valve replacement using the Perceval S bioprosthesis (Sorin Group, Saluggia, Italy). In addition we sought to evaluate whether there were any preoperative predictive indicators to identify those patients at higher risk of PM implantation using this technique.
Methods During the study period a total amount of 58 consecutive patients (male 43%, age 77.9 ± 4.9 years) with severe aortic stenosis having undergone SAVR were included. Twenty-eight



Abstract 22 Figure 1 SAVR

patients (48%) underwent an isolated AVR procedure; in the rest of study population AVR was performed in combination with coronary artery bypass graft (CABG) in 26 patients (45%), surgical pulmonary vein isolation in 2 (3%), tricuspid valve replacement (TVR) in 1 (2%) and both TVR and mitral valve replacement (MVR) in 1 (2%). Full median sternotomy was performed in all patients.

Results During a mean follow up of 13.8 ± 5.0 months (median 13 months), 14 patients (24.1%) underwent dual-chamber pacemaker (PM) implantation after the SAVR procedure. The mean time to PM implantation was 5.4 ± 3.6 days (median 5 days). Ten out of 14 (71%) were found completely PM-dependent after PM implantation.

The comparison of pre-operative characteristics between PM group and no PM group highlighted that QRS duration, EuroSCORE II index and chronic renal dysfunction were significantly associated with postoperative PM implantation (respectively, p = 0.01, p = 0.02 and p = 0.03).

Conclusions In conclusion, we have found that chronic renal disease and QRSd are significant predictors of PM insertion post-Perceval SAVR.

23 THREE YEAR REVIEW OF MITRAL VALVE SURGERY: PREDICTABILITY OF MITRAL VALVE REPAIR

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10.1136/heartjnl-2016-310523.23

Aims We aim to outline a three year review of consecutive mitral valve surgeries performed by a single surgeon. We further aim to establish the predictability of mitral valve repair in the degenerative population.

Methods All patients who underwent isolated or combined mitral valve surgery from January 2013 to April 2016 had their pre operative echocardiograph and their operative note reviewed. In cases of degenerative disease this data was reviewed to compare predicted repair rates to actual repair rates.

Results 181 patients underwent mitral valve surgery. Underlying pathologies were as follows; degenerative 57% (n = 103), functional/ischaemic 18.2% (n = 33), rheumatic 13.3% (n = 24), previous endocarditis 7.1% (n = 13), revision mitral valve surgery 4.4% (n = 8) and systolic anterior motion of the mitral valve 0.6% (n = 1). 78.5% (n = 142) of patients underwent mitral valve repair and 21.5% (n = 39) of patients underwent mitral valve replacement. 99.02% (n = 141) of patients with degenerative disease underwent a successful repair and 0.08% underwent mitral valve replacement.

Conclusion Degenerative mitral valve disease remains the most common underlying pathology requiring mitral valve surgery. In high volume services, excellent repair rates can be achieved. This serves to further support the role of mitral valve surgery in patients with asymptomatic mitral valve disease.

24 ABSENCE OF A WEEKEND EFFECT ON 30 DAY MORTALITY AMONG 3757 PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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10.1136/heartjnl-2016-310523.24

Objectives Several publications have demonstrated increased 30 day mortality in patients admitted on Saturdays or Sundays compared with weekdays. We sought to determine whether this was true for two different cohorts of patients admitted with acute myocardial infarction (MI).

Methods and results Thirty-day mortality data were obtained for 3757 patients who had been admitted to the Belfast HSC Trust with acute myocardial infarction between 2009 and 2015. They were subdivided into those presenting with ST elevation MI (STEMI, n = 2240) and non-ST elevation MI (NSTEMI, n = 1517). Day of admission was evenly spread across the week among all patients and among those who died within 30 days (**Figure 1**). Overall, 30 day mortality was 5.32% (6.25% among

Abstract 24 Table 1 30 day mortality among 3757 patients admitted with acute myocardial infarction, by day of admission and type of myocardial infarction

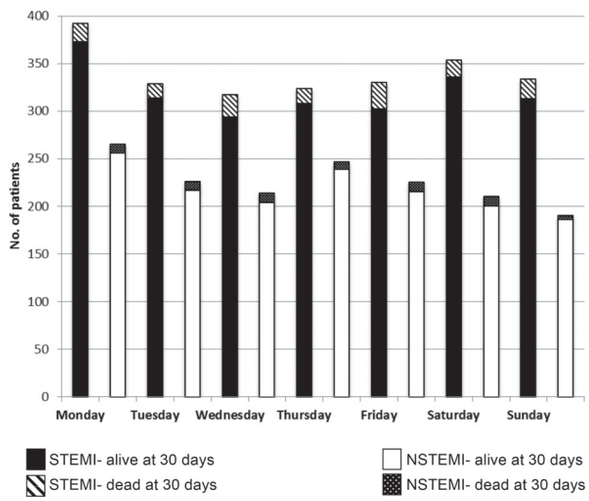
	Admitted Mon–Fri (30-day mortality)	Admitted Sat–Sun (30-day mortality)	Chi^2	P value
STEMI (n = 2240)	101/1591 (6.35%)	39/649 (6.00%)	0.068	0.423
NSTEMI (n = 1517)	46/1131 (4.10%)	14/386 (3.63%)	0.147	0.417

Abstract 24 Table 2 Cox proportional hazard ratios (95% confidence intervals) comparing 30 day mortality hazard associated with each day of admission compared with Wednesday, among 3757 patients admitted with acute myocardial infarction (MI), following adjustment for type of infarction, age and gender

			30 day mortality			
Patients with MI (n = 3757)	Sun vs Wed	Mon vs Wed	Tues vs Wed	Thurs vs Wed	Fri vs Wed	Sat vs Wed
	0.997 (0.722, 1.375)	1.001 (0.735, 1.362)	0.856 (0.616, 1.188)	0.880 (0.634, 1.220)	0.962 (0.701, 1.319)	0.883 (0.640, 1.139)

patients with STEMI and 3.96% in patients with NSTEMI). We observed no difference in 30 day mortality between those admitted at weekends and those admitted on weekdays (**Table 1**). The Cox Proportional Hazards model constructed hazard ratios for 30 day mortality associated with each day of admission compared with Wednesday. Following adjustment for covariates (age, gender and type of infarction), there was no significant excess hazard for any day of the week compared with Wednesday (**Table 2**).

Conclusions We observed no evidence of an excess 30 day mortality associated with weekend admission. The data suggest that not all patients admitted as emergencies at weekends are exposed to excess mortality risk. Further work is needed to repeat this analysis on a larger, national cohort.



Abstract 24 Figure 1

25 DETERMINANTS OF PCI SUCCESS IN REPEAT CHRONIC TOTAL OCCLUSION PROCEDURES FOLLOWING AN INITIAL FAILED ATTEMPT

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10.1136/heartjnl-2016-310523.25

Objectives Failed percutaneous recanalisation of chronic total occlusions (CTO) constitutes a clinical conundrum. While percutaneous treatment is often abandoned in favour of medical therapy, CTO PCI expertise and alternative techniques may contribute to improve procedural success. We investigated the rates and determinants of success of repeat PCI following an initial failed attempt at recanalising the CTO percutaneously.

Methods and results Out of 445 consecutive first attempt CTO-PCI procedures in our institution, procedural failure occurred in 149 (33.5%). 64 re-PCI procedures were performed in 58 patients (39%) all had a single CTO. Procedural and outcome data in the re-PCI population was prospectively entered into the institutional database. A retrospective analysis of clinical, angiographic and procedural data was performed. Procedural success was achieved in 41 (64%) procedures. Univariate analysis of clinical and angiographic characteristics showed that re-PCI success was associated with intravascular ultrasound (IVUS) guidance (19.5% vs. 0%, p = 0.042), while failure was associated with severe calcification (30.4% vs. 9.7%, p = 0.047) and a JCTO score >3 (56.5% vs. 17.1% p = 0.003). Following multiple regression analysis the degree of lesion complexity (J-CTO score >3), IVUS use, involvement of an experienced CTO operator and LAD CTO location were significant predictors of successful re-PCI. Overall the complication rate was low, with the only MACCE two periprocedural MI's neither of which required intervention.

Conclusions Our findings suggest that re-PCI increases substantially the overall success rate of CTO revascularisation. Predictors of re-PCI success included the use of IVUS, the involvement of an experienced CTO operator in the repeat attempt and the location of the CTO.

26 A RETROSPECTIVE AUDIT OF IN-HOSPITAL 30-DAY MORTALITY FROM ACUTE MYOCARDIAL INFARCTION IN CONNOLLY HOSPITAL BLANCHARDSTOWN

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10.1136/heartjnl-2016-310523.26

Background In March 2015 The Department of Health published the first annual report of the "National Healthcare Quality Reporting System." This was designed to report the quality of healthcare provided across all sectors of our system. The measure of acute cardiac care was in-hospital mortality within 30 days of admission for acute myocardial infarction (AMI). Data was collected via HIPE data by the Healthcare Pricing Office (HPO), an administrative branch of the Health Service Executive. The national average was found to be 6.8 deaths per 100 cases. Connolly Hospital Blanchardstown was one of three hospitals that had age-sex standardised mortality rates that were statistically significantly higher than the national average with a rate of 9.87 deaths per 100 cases. Our audit aimed to assess the accuracy of the findings.

Methods Patients were identified by searching the HIPE system for patients who had been labelled with a primary diagnosis of AMI and had died within 30 days of this diagnosis between 2011 and 2013. We then performed a chart review and examined patients' death certificates.

Results 42 patients were classified by HIPE as having had a primary diagnosis of AMI with mortality within 30 days. Only 23 (54.8%) of these patients were confirmed as having had an AMI as per WHO criteria during the course of their admission, 22 by chart review and one by post-mortem. Of these patients, twenty (87%) died within 30 days of their AMI. Patients who died post AMI were more likely to have been seen by cardiology services (87% vs 57.9%), to have had palliative care review (60.9% vs

36.8%) and to have been determined not for resuscitation (78.3% vs 42.1%). We found that twelve patients had AMI placed as a cause of death (10 primary cause, 2 antecedent cause) on death certificate despite having not suffered AMI during their hospital admission. If the 22 patients incorrectly coded were excluded from the AMI data, the mortality rate within 30 days post-AMI in CHB would fall to 4.14 deaths per 100 cases, well below national average.

Conclusions Analysing the performance of our healthcare system is imperative to provide a quality service to our patients and to improve our healthcare service. The analysis of data however is only useful if the data itself is accurate. Our audit showed that many of the patients coded as having had a primary diagnosis of AMI by HIPE had not in fact suffered AMI, and some of those who had, did not die within 30 days of the event. It would be our hope that the discrepancies shown in this audit would feed back to the HSE to enable a more accurate data-entry in the future and also to NCHD training programmes with instruction in particular on the importance of the accurate documentation of diagnoses and completion of death certificates. The findings of our audit underline the need to ensure that the data collected accurately represents outcomes, the responsibility for which lies with both clinicians and coding staff.

Oral Abstract Presentations 2

27 IMPACT OF MULTIVESSEL DISEASE ON CLINICAL ENDPOINTS

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10.1136/heartjnl-2016-310523.27

Introduction There is a large subset of patients with ST elevation myocardial infarction (STEMI) with significant disease beside the culprit artery. Multivessel disease has been reported as one of the predictors of worse outcome. It is not clear if this related to incomplete revascularisation or due to increased disease burden per se.

Purpose and methods In this study we retrospectively reviewed 317 patients who were admitted with STEMI in our centre to estimate the effect of multivessel disease on clinical outcomes in terms of mortality, heart failure and length of stay. We tested whether incomplete revascularisation impacts MVD as predictor of clinical outcomes. A retrospective review of 317 patients who attended our centre between January 2013 to December 2014. Medical records and angiographic reports were reviewed. Patients were divided into two groups, MVD group V's single artery group. Mortality rates between the two groups were compared using X^2 test and binary logistic regression estimate Odd ratio using STAT14.0.

Results Of 317 patients who presented with STEMI, 95.3% received PPCI with the remaining unsuitable for coronary angiography for various reasons. The mean age of patients was 65 years. 27.13% were female. In hospital mortality was 8.2% and 1 year mortality = 10.74% (P = 0.35). 58.5% had two-vessel disease or more (33.7% two, 22.8% three-vessel disease, 2% 4-vessel disease). Multivessel disease was associated with increased in-hospital mortality of 9.44% vs 3.15% up to 12.35% vs 5.0% 1-year mortality (P = 0.031, 0.034) Odd ratio = 3.2. Patients with multivessel disease tend to be older (mean 66.8 vs 61) and have longer hospital stay (mean = 5.6 vs 3.9 days). Female sex, ejection fraction, symptomatic heart failure, use of Intra-aortic balloon pump were similar between the two groups. Repeat revascularisation, myocardial infarction, repeat angiogram for chest pain and readmission rates were similar between the two groups. With multivariae logistric regression, only age was independent predictor of mortality in this cohort.

Conclusion MVD in patients with STEMI is associated with higher mortality and longer hospital stay. The increased mortality can be attributed to older age in patients with MVD and incomplete revascularisation.

28 STEMI IN THE ELDERLY: ARE WE TREATING APPROPRIATELY, A LARGE PRIMARY PCI CENTRE EXPERIENCE

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10.1136/heartjnl-2016-310523.28

The elderly population (aged 80 years or older) with acute coronary syndrome is a heterogeneous group with variable frailty and differences in physiological ageing, comorbidity and functional status. Treatment of elderly patients is challenging because they are more likely than younger patients to have atypical symptoms, such as an absence of chest pain, in acute coronary syndrome. We undertook a review of the elderly population that was referred to St James Hospital as part of the National ACS programme and those that were diagnosed as an inpatient with a ST elevation MI (STEMI). We collected data from January to December 2015. We used the heartbeat database and HIPE data. We examined how many over 80's had invasive angiography and looked at key performance indicators such as ECG to door time (DDT) and ECG to reperfusion time (RT) as benchmarks of care. Our aim was to see if these patients are less likely to receive invasive treatment and if they are at a higher risk for adverse events than younger patients.

Results In 2015 there were 486 patients referred as a code STEMI to the cardiology service in SJH or diagnosed as an inpatient. The average age was 62.2 years (median 62, range 23–91 years), 25% (123) female. This included 48 patients aged 80 years and older, average age 84 (median 84, range 80–91). 22 (46%) were male with an average age of 82.6 years (median 82, range 80–88). The average female age was 84.7 years (median 85, range 80–91). The mean DDT was 89 minutes (SD 87). In SJH ED the average door to ECG time was 10 minutes (range 8–12). STEMI was the confirmed diagnosis in 38 patients; only 3 of these patients did not undergo coronary angiography. The mean RT was 105 minutes (SD 44). Six patients did not survive to discharge, a mortality rate 12.5% versus 4% in the under 80's. The DDT and RT in the under 80's were 102 and 123 minutes. There is often concern over the lack invasive care undertaken in the elderly population, that they are not managed in accordance with guideline recommendations. Our experience demonstrates that the elderly STEMI population is undergoing invasive testing and invasive therapies as per guidelines and on average within the recommended time windows. This is encouraging in an ever-expanding subgroup that is inherently higher risk. However the mortality rate was much higher in elderly, reflecting how high risk a population they are. (6-month mortality data to follow.)

29 LONG-TERM OUTCOMES IN THE SURGICAL MANAGEMENT OF LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN HYPERTROPHIC CARDIOMYOPATHY

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10.1136/heartjnl-2016-310523.29

Hypertrophic Cardiomyopathy is the most common genetically inherited cardiac disease affecting 1 in 500 of the population. Dynamic Left Ventricular Outflow Tract Obstruction (LVOTO) caused by systolic anterior motion of the mitral valve is present in up to two thirds of patients. Surgical intervention can alleviate LVOTO and improve symptoms but the risks and long-term outcomes of different surgical strategies are unknown.

Methods Survival and clinical outcomes were assessed at 1, 5 and 10 years post operatively in 362 patients with HCM undergoing surgical intervention for LVOTO at a specialist cardiomyopathy centre. The primary survival endpoint was all cause mortality.

Results Group A (n = 286) underwent septal myectomy; Group B (n = 32) underwent septal myectomy and MV repair; Group C (n = 26) underwent myectomy and MV replacement and Group D (n = 17) underwent MV replacement without myectomy. There were 93 concomitant procedures including CABG, AVR, MAZE procedure and left atrial appendage closure across groups. Mean follow up was 6.2 years and longest follow up was 46.6 years. NYHA functional class improved from 2.49 to 1.48 post-operatively ($p < 0.05$). The mean resting LVOT gradient improved from 72 mmHg to 13.6 mmHg at 1 year post procedure; 14.4% of patients were operated on because of latent obstruction. There were 16 repeat surgeries including 9 redo myectomies, 6 MV Replacements and 1 MV Repair with a mean time to reintervention of 5.3 years. 28 patients met the primary endpoint of all-cause mortality at a mean of 9.6 years. There were 4 procedural related mortalities and 24 mortalities on late follow up greater than 30 days post procedure. Survival analysis was estimated using Kaplan-Meier curves and log-rank testing. Estimated survival rates post-operatively at 1, 5 and 10 years respectively were 98.9%, 97.5%, 93.7% in group A; 97%, 97%, 32.3% in group B 96.2%, 90.5%, 90.5% in group C; and 93.3%, 80%, 80% in the group D ($p < 0.05$).

Conclusion Different surgical techniques are adopted for the management of LVOTO. Septal myectomy in particular is shown to have good long term outcomes with low rates of reintervention.

30 DOES THE HEART SCORE PREDICT OUTCOMES OF CHEST PAIN ADMISSIONS AND CAN IT FACILITATE A SAFE EARLY DISCHARGE?

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Aim The focus of the diagnostic process in chest pain presentations to the accident and emergency department is to rapidly identify low and high-risk patients for acute coronary syndromes (ACS). The HEART score facilitates this but we sought to determine its utility in safely discharging patients.

Methods In this prospective observational study consecutive patients presenting to St James Hospital with chest pain, without ST elevation between January – July 2015 were followed. The primary outcome was to determine if the HEART score was predictive of six-week major adverse cardiovascular event (MACE) defined as the composite incidence of myocardial infarction, stroke, unplanned revascularisation and death. Baseline demographics, clinical diagnosis and traditional cardiac risk factors, troponin level, ischaemic electrocardiogram changes, HEART score (1–10), admission rates, plaque burden (Syntax and GENSINI score) and MACE at six weeks were recorded.

Abstract 30 Table 1 Characteristics

Characteristic	Non cardiac chest pain	Stable angina	Unstable angina	P value
Age (years)	54 ± 9	65 ± 12	65 ± 12	< 0.001
Male Sex	54%	72%	73%	0.15
Risk factors (1–5)	2.2	2.7	3.0	0.4
HEART score	2 ± 0.95	4.5 ± 1.6	5.6 ± 1.8	<0.0001
Abnormal ECG	19%	34%	64%	0.0004
Patient admitted for further investigation	77%	94%	100%	0.2
Angiogram performed	48%	95%	100%	0.1
Required revascularisation	2%	57%	90%	<0.0001
GENSINI score	1.5 ± 3.3	16 ± 18.8	26.5 ± 18.7	<0.0001
Syntax Score	2.7 ± 7	6.8 ± 6	9.7 ± 7	0.0006

Results One hundred and twenty four patients, 43 with a diagnosis of non-cardiac chest pain (NCCP), 44 with stable angina (SA) and 37 with unstable angina (UA) were followed. Table 1 illustrates patient characteristics. Data is presented as mean and standard deviations for continuous data and as percentages for dichotomous data.

The six-week incidence of MACE was 3.7% for a HEART score of 0–3, 54% for a HEART score of 4–6 and 73% for a HEART score of 7–10 ($p < 0.0001$). The HEART score accurately predicted the incidence of MACE at six weeks in all groups with an area under the curve of 0.96 (95% CI: 0.93−0.98, $p < 0.001$).

The HEART score correlated with total plaque burden measured by GENSINI score $r = 0.4$ ($p < 0.001$) and Syntax score $r = 0.3$ ($p = 0.003$). 44% of patients had a HEART score of 0–3 of which could have facilitated a safe early discharge for this cohort.

Conclusion The HEART score is an effective tool for safely identifying chest pain patients at high risk of MACE. Its application can facilitate safe early discharge for low risk patients.

31 CARDIAC MYXOMA IN THE REPUBLIC OF IRELAND: A NATIONAL INCIDENCE STUDY

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We would like to acknowledge all of the cardiac surgeons in Ireland whose surgery has contributed to this study

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Aim Atrial Myxomas are the most common primary, cardiac tumour. Very few studies, which examine age-standardised incidence rates, exist. The Republic of Ireland is a captive population, ideal for incidence studies. A previous national study, published in 1993, concluded that the incidence, of cardiac myxomas in Ireland, was 0.05 per 100,000 per year. We aim to establish the national age-standardised incidence of cardiac myxomas, for both men and women, in Ireland.

Methods We conducted a ten year, retrospective study involving all patients who underwent resection of a cardiac myxoma in the Republic of Ireland between 2004 and 2013. Key word search of histology records were cross-referenced with theatre logs and review of patient charts. An age-standardised incidence rate was performed based on the national census figures from 2011.
Results A total of 91 patients underwent resection of a cardiac myxoma in Ireland between January 2004 and December 2013. 63% (n = 57) of patients were female and 37% (n = 34) were male. Overall age standardised incidence is 0.15 per 100,000 (age range 17–87). Age standardised incidence of 0.11 per 100,000 for men (range 17–87). Age standardised incidence of 0.17 per 100,000 for women (range 23–85). Median age at time of surgery was 63 for women and 60.5 for men. 89% (n = 81) of tumours were located in the left atrium with 9.9% (n = 9) in the right atrium and 1.1% (n = 1) in the ventricle.
Conclusion Age-standardised rate of cardiac myxoma in Ireland is 0.15 per 100,000 per year. An apparent, three fold increase in incidence, when compared with an older irish study, is likely due to improved pre operative diagnostic techniques.

Oral Abstract Presentations 3

32 HIGHLY SELECTIVE TROPONIN T (HSTNT) AND HEART-TYPE FATTY ACID-BINDING PROTEIN (H-FABP) AS MARKERS OF TYPE 4A MYOCARDIAL INFARCTION AND ADVERSE EVENTS IN ELECTIVE PERCUTANEOUS CORONARY INTERVENTION (PCI)

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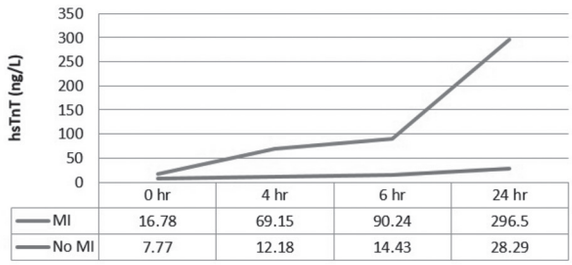
10.1136/heartjnl-2016-310523.32

Introduction Heart-type Fatty Acid-Binding Protein (H-FABP) may be useful for early diagnosis of ACS[1,2] and has been associated with increased cardiovascular events. Type 4 a procedural myocardial infarction (MI) may occur after percutaneous coronary intervention (PCI).[3] Little is known about the use of early biomarkers as predictors of cardiovascular events following elective PCI.
Methods We prospectively evaluated highly sensitive troponin T (hsTnT), H-FABP, troponin I (TnI), creatine kinase MB type (CKMB), myoglobin, glycogen phosphorylase BB (GPBB) and carbonic anhydrase 3 (CA3) at 0, 4, 6 and 24 hours following elective PCI. Baseline demographic and cardiac risk factors were recorded. The primary endpoint was type 4 a MI, diagnosed as a rise of >5 × 99th upper reference limit (URL) of 14 ng/dl (i.e., rise of >70 ng/dl) at 6 hours if hsTnT was normal at baseline or >20% from 0 to 6 hours if hsTnT was >14 ng/dl at baseline.[3] Patients were followed up at 1 year to assess for major adverse clinical events (MACE); MI, target vessel revascularisation, heart failure, stroke and death.
Results We enrolled 241 patients of whom 32 were excluded due to withdrawal of consent or PCI being cancelled after angiography. A cohort of 209 patients was included in analysis, of whom 144 (68.9%) were male, mean age was 68.8 years, 28 (13.4%) were smokers, 31 (14.8%) were diabetic, 199 (95.2%) had hypercholesterolaemia and 138 (66.0%) had hypertension. Type 4 a MI was observed in 37 (17.7%) patients. Comparing those with and without type 4 a MI, there was no statistical difference in risk factors (p > 0.05) except for age (p = 0.015). Median

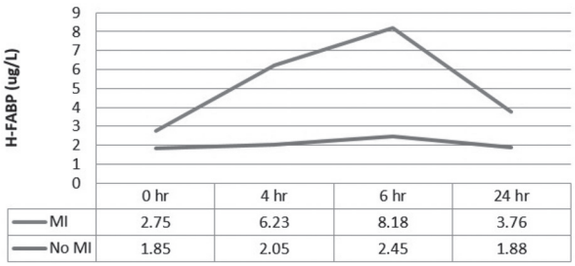


Abstract 32 Figure 1 hsTnT release between type 4a (n = 37) and no type 4a MI (n = 172)

Abstract 32 Table 1 Summary of biomarker results at 4 hours

4 hr biomarker	Type 4a MI		No type 4a MI			
	Median	IQR	Median	IQR	AUC	P value
H-FABP (µg/L)	6.23	6.22	2.05	1.45	0.91	<0.001
TnI (µg/L)	<0.18	0.07	<0.18	0.01	0.62	0.004
CKMB (µ/L)	3.54	3.37	2.01	1.25	0.75	<0.001
Myoglobin (ng/ml)	72.75	55.68	35.82	38.91	0.72	<0.001
GPBB (pg/L)	3.37	3.50	3.45	2.48	0.50	0.889
CAIII (µg/L)	28.76	23.67	25.25	26.41	0.60	0.168

H-FABP: heart-type fatty acid-binding protein; hsTnT: highly sensitive troponin T; TnI: troponin I; CKMB: creatine kinase MB; GPBB: glycogen phosphorylase; CAIII: carbonic anhydrase III; IQR: interquartile range; AUC: area under curve.



Abstract 32 Figure 2 H-FABP release between type 4a (n = 37) and no type 4a MI (n = 172)

Abstact 32 Table 2 Summary of biomarker change from 0–6 hours in 1 year MACE and non MACE patients

Biomarker	MACE		No MACE			
	Median change	IQR	Median change	IQR	AUC	P value
hsTnT (ng/L)	38.32	135.61	7.07	23.49	0.94	0.06
H-FABP (µg/L)	3.73	21.36	0.56	2.45	0.91	0.04
TnI (µg/L)	0.47	0.01	0.09	0.22	0.97	0.11
CK-MB (µg/L)	0.45	4.01	0.18	1.14	0.89	0.29
Myoglobin (ng/ml)	15.47	185.49	2.80	36.55	0.94	0.07
GPBB (pg/L)	−0.86	8.08	1.75	5.13	0.71	0.31
CAIII(µg/L)	24.13	18.23	1.08	20.91	0.91	0.02

H-FABP: heart-type fatty acid-binding protein; hsTnT: highly sensitive troponin T; TnI: troponin I; CKMB: creatine kinase MB; GPBB: glycogen phosphorylase; CAIII: carbonic anhydrase III; IQR: interquartile range; AUC: area under curve.

troponin at 6 hours was 90.24 ng/dl (95% CI: 76.56–186.41) versus 14.43 ng/dl (95% CI: 16.37–21.26) in the type 4 a/non type 4 a groups respectively, p ≤ 0.001, Figure 1. Median H-FABP at 4 hours was most predictive of type 4 a MI (followed by CKMB and myoglobin) with levels of 6.23 ng/l (95% CI: 4.38–18.96), versus 2.05 ng/l (95% CI: 2.23–2.74), p ≤ 0.001, AUC 0.91, Table 1, Figure 2. Results for TnI, CKMB, myoglobin, GBPP and CA3 are shown in Table 1. Multivariate logistic regression (stepwise elimination) showed H-FABP to be most predictive of type 4 a MI, p < 0.001. Sensitivity of 4 hour H-FABP (>6.32 ng/ml) for type 4 a MI was 51.5%, specificity 96.1%, positive predictive value (PPV) 73.9%, negative predictive value (NPV) 90.3%, odds ratio (OR) 26.39, relative risk (RR) 7.62. MACE was noted in 6 (2.9%) patients (three MI, two death and one stroke), 3 of which had type 4 a MI at index PCI, p = 0.036. Table 2 compares median change in H-FABP and hsTnT from 0–6 hours in patients who developed MACE at 1 year with CA3 performing best, p = 0.02.

Conclusions/implications Median 4 hour H-FABP was most predictive of a 6 hour hsTnT rise as a consequence of type 4 a MI in elective PCI, followed by CKMB and myoglobin. H-FABP, hsTnT and CA3 were predictive of MACE at 1 year.

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33 THE GENESIS AND DEVELOPMENT OF A MULTIDISCIPLINARY ATRIAL FIBRILLATION CLINIC

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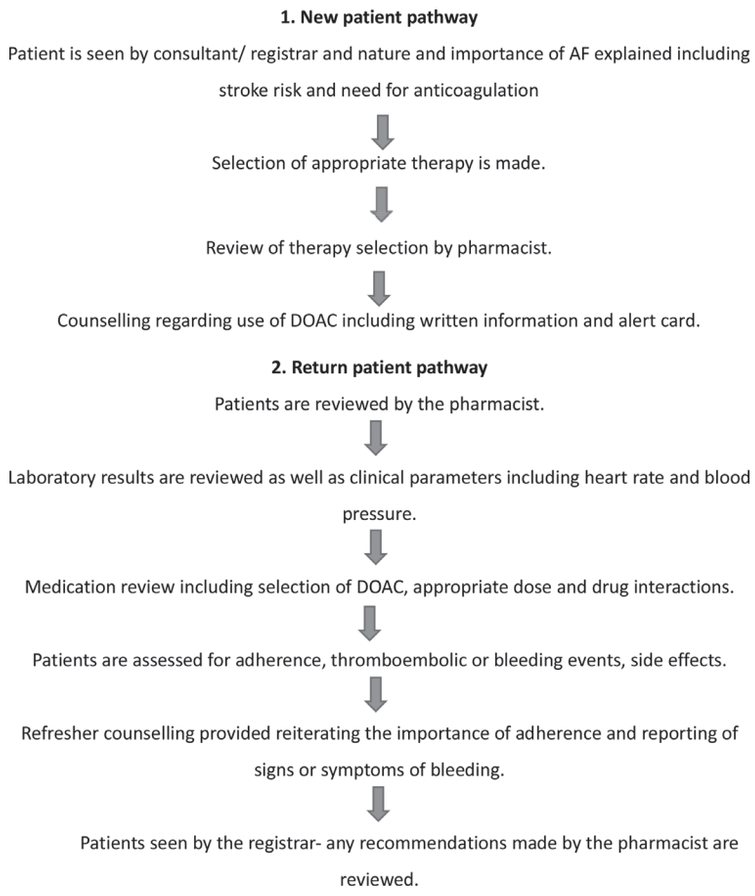
Introduction Atrial fibrillation (AF) is commonest cardiac arrhythmia. Treatment of AF includes drugs for rate or rhythm control and usually anticoagulation. Direct Oral Anticoagulants (DOACs) are now anticoagulants of choice. Our hospital had no formalised structure for AF management or governance over DOAC treatment. Main stakeholders (cardiology, stroke and pharmacy) agreed development of multi-disciplinary AF clinic. This abstract describes the evolution and set up of such a clinic and the profile of the patients seen (Table 1).

Methods A formal plan developed by the stakeholders over 6 week period. European Heart Rhythm Association (EHRA) algorithm adopted as gold standard for monitoring patients on DOACs. Identified pharmacy lead at clinic undertook prescribing course under tutorship of Lead Cardiologist. This facilitated drafting of treatment protocols/data collection forms at clinic.

Results Clinic operates 8 patient slots weekly. There are two patient pathways. Patients return at 1, 4 and 10 months for



Abstract 33 Table 1 Average patient profile of AF clinic

Patient parameter	Average
Sex	59% male
CHA_2DS_2-VASc	3.4
HAS-BLED	1.6
Average BMI	30 kg/m^2
Renal function (CrCl)	61 ml/min
No. of medications	6
Patients reporting adherence**	85%

review and are then discharged back to their GP. To date the clinic has seen over 200 patients over an eleven month time period.

Conclusion This clinic is first multidisciplinary AF clinic of its' kind and we believe it represents an achievable model elsewhere to ensure gold standard treatment of patients with atrial fibrillation. Demand for clinical review of atrial fibrillation is growing so further resourcing will be needed in future as demography changes. An audit on all patient consultations from a Pharmacy and Medical perspective is ongoing to capture the value of this initiative.

34 HOUR QT ANALYSIS IN THE PREDICTION OF GENOTYPE POSITIVITY IN SUSPECTED LQTS: A STUDY IN BOTH PROBAND AND FAMILY SCREENING POPULATIONS

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10.1136/heartjnl-2016-310523.34

Introduction LQTS is an inheritable condition with a suspected prevalence on 1/2000 and has a risk of sudden cardiac death due to ventricular arrhythmia if untreated. 24 hour QT analysis is a method of averaging QT measurements obtained via holter monitoring over a 24 hour period. The utility of 24 hour QT analysis to predict genotype positivity has not been widely studied.

Methods 28 probands with genetic testing results and 107 first degree relatives of genotyped LQTS patients were included in the analysis. Retrospective review of the medical charts of all patients was performed. Parameters analysed included corrected QT (QTc) interval on 12 lead ECG, 24 hour ambulatory ECG, the QTc after 4 minutes of recovery post exercise stress testing (EST), and the Schwartz score based on clinical and ECG criteria. All these parameters were then compared to the results of subsequent genetic testing.

Results 28 probands were analysed with 7 returning a positive gene test and 21 returning a negative gene test. Gene positive individuals had significantly greater QTc by resting ECG ($p = 0.047$), 24 hour ECG ($p = 0.005$) and after 4 minutes recovery post EST ($p = 0.001$) (independent t-test). Using standard cut offs (450 ms for males and 460 ms for females) the association between clinically positive resting ECG and positive genotype was not statistically significant ($p = 0.17$). Schwartz score >3.5 showed no significant difference between gene positive and gene negative groups ($p = 0.33$). 24 hour QTc ($p = 0.029$) was significantly associated with positive genotype and QTc at 4 minutes recovery post EST showed a trend toward significance ($p = 0.069$). Of 107 first degree relatives of LQTS cases there were 50% gene positive cases. There were statistically significant differences between gene positive and gene negative family members in QTc ($p < 0.001$), 24 hour QTc $p < 0.001$), QTc at 4 minutes recovery post EST ($p = 0.001$), and Schwartz score ($p < 0.001$). A Schwartz score of >3.5 was 98% specific for genotype positive LQTS but this test had a very low sensitivity of 29%. The most sensitive test was 24 hour QTc with a cut off of 450 ms for males and 460 ms for females with a sensitivity of 69% and specificity of 83%.

Conclusions Family screening and prevention of sudden cardiac death is central to the management of LQTS. Current individual clinical testing methods are not sufficiently sensitive to diagnose LQTS alone and must be used in combination to assess the risk of LQTS. 24 hour QT analysis is the most sensitive method of predicting positive genotype in both probands and family members of affected individuals.

35 PREVALENCE OF BRUGADA SYNDROME IN HIGH RISK IRISH POPULATION – DATA FROM CARDIAC RISK IN YOUNGER PERSONS (CRYP), TALLAGHT, DUBLIN

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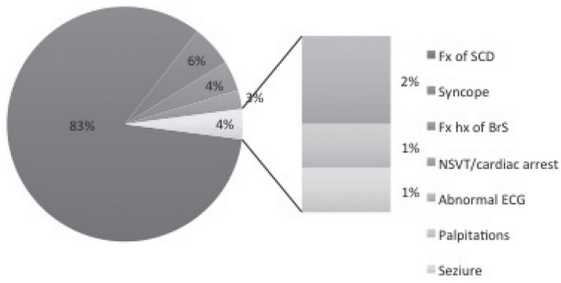
10.1136/heartjnl-2016-310523.35

Introduction Brugada Syndrome (BrS), first described by 2 Spanish brothers, is a genetic arrhythmogenic disease characterised by appearance of coved-shaped STelevation on electrocardiogram (ECG) in precordial leads V1–V3 in the absence of structural heart disease, electrolyte imbalance or ischemia. It is associated with syncope and sudden death, typically at rest or during sleep.

Methods We used our CRYP database to identify individuals as having probable BrS based on clinical presentation, family history and result of provocation test using ajmaline. Ajmaline, a short-acting sodium channel blocker, unmasks these dynamic, and often concealed, BrS ECG changes. Ajmaline dosed at 1 mg/kg body weight was infused at a rate of 10 mg/min with continuous ECG monitoring, with modified lead placement as per protocol (1). The test was deemed positive with the development of abnormal coved-type ECG changes in precordial leads V1–V3.

Results Of 207 patients (85 families) selected for ajmaline testing, 193 underwent provocation testing. The most common indication for referral was family history of sudden cardiac death (161), followed by symptoms of syncope (11), patients with a known family history of BrS (8), patients who suffered cardiac arrest/non-sustained ventricular tachycardia (5), patients with borderline ECG that did not fit the criteria for BrS (4), patients presenting with palpitations (2) and seizures (2). (Figure 1) 10 patients (6 males, 4 females) developed Type 1 ECG changes, 2 developed Type 2 changes and 2 developed QRS prolongation. Of the 10 who were positive, 6 patients belonged to 2 families and 4 were unrelated. 2 patients subsequently underwent ICD placement. The rest of the patients remain well and are routinely followed up for development of symptoms.

Conclusion Sudden arrhythmic death syndrome (SADS) is defined as a sudden, unexpected death in a person with no known prior cardiac disease, last seen well within 12 hours of the death and within 1 hour of the onset of symptoms (if any) in whom a full post-mortem examination including toxicology investigations could not identify the cause of death (2). In Ireland SADS has reported incidence of 0.76 per 100,000 compared to 0.16 per 100,000 in the United Kingdom (3). In our study, out of 85 families screened through ajmaline test for BrS, 6 families were found to have



Abstract 35 Figure 1 Indication for referral

evidence of BrS (7%). A similar study by McGorrian et al, in which 73 families were screened for SADS in Ireland, the results were very similar. They identified 22 families with a potential inheritable cause of SADS, of which 5 families were found to have evidence of BrS (7%). These identical results suggest that Brugada syndrome is a relatively rare but definite cause of sudden cardiac death in the Irish population. Ajmaline testing should considered and routinely performed in patients screened for SADS.

36 SIMPLIFYING THE AUDIT OF RISK FACTOR RECORDING AND CONTROL: A REPORT FROM AN INTERNATIONAL STUDY IN 11 COUNTRIES

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Presented on behalf of the SURF investigators

10.1136/heartjnl-2016-310523.36

Background To simplify the assessment of the recording and control of coronary heart disease risk factors in different countries and regions.
Design The SUrvey of Risk Factors (SURF) is an international clinical audit.
Methods Data on consecutive patients with established coronary heart disease from countries in Europe, Asia and the Middle East were collected on a one-page collection sheet or electronically during routine clinic visits. Information on demographics, diagnostic category, risk factors, physical and laboratory measurements, and medications were included and key variables summarised in a Cardiovascular Health Index Score.
Results Coronary heart disease patients (N.10,186; 29% women) were enrolled from 79 centres in 11 countries. Recording of risk factors varied considerably: smoking was recorded in over 98% of subjects, while about 20% lacked data on laboratory measurements relevant to cardiovascular disease risk. Sixteen per cent of participants reported smoking, 29% were obese, and 46% had abdominal obesity. Sixty per cent of participants had blood pressure <140/90 mmHg (140/80 mmHg for diabetics), 48% had HbA1c <7%, 30% had low-density lipoprotein <1.8 mmol/l and 17% had a good cardiovascular health index score. There were substantial regional variations. Less than 3% of patients attended cardiac rehabilitation in Asia or the Middle East, compared with 45% in Europe. In Asia, 15% of patients had low-density lipoprotein cholesterol <1.8 mmol/l compared with 33% in Europe and 36% in the Middle East. Variations in medications were noted, with lower use of statins in Asia.
Conclusions SURF proved to be practical in daily practice. Results indicated poor control of risk factors with substantial variation between countries, calling for development and implementation of clinical standards of secondary prevention of coronary heart disease.

Moderated Poster Session 2

37 NEUTROPHIL TO LYMPHOCYTE RATIO AS A PREDICTOR OF OUTCOMES AND PLAQUE BURDEN IN ST SEGMENT ELEVATION MYOCARDIAL INFRACTION (STEMI)

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10.1136/heartjnl-2016-310523.37

Aim Several inflammatory markers have been implicated in the pathogenesis of STEMI. The prognostic role of a simple bedside marker like neutrophil to lymphocyte ratio in predicting outcomes after STEMI remains undefined.
Methods Consecutive admissions with STEMI were compared to consecutive patients presenting with stable angina over a 60-day period to St James's Hospital, Dublin. Data gathered included demographics, neutrophil: lymphocyte ratio (NLR) pre angiography, plaque burden using GENSINI and Syntax scores, major adverse cardiac events (MACE) at six week, TIMI grade at end of procedure and ejection fraction at six weeks. Patients with acute sepsis, recent surgery, autoimmune diseases or underlying malignancy were excluded.
Results Ninety-seven patients, 44 with stable angina and 53 with STEMI were followed to six weeks post discharge. Table 1 illustrates the baseline demographics and outcomes. STEMI patients were younger, more likely to have a higher NLR, higher plaque burden, troponin and lower ejection fraction.
On multivariate analysis predictors of MACE at six weeks in the STEMI cohort were NLR > 4.5 (OR 1.2, CI: 1–1.34,P = 0.05) but not GENSINI score, Syntax score, ejection fraction or TIMI grade at end of procedure. NLR was not associated with six week

Abstract 37 Table 1 Characteristics

Characteristic	Stable Angina	STEMI	P value
Age (years)	65 ± 12	59 ± 15	0.006
Male Sex	53%	69%	0.1
Neutrophil: Lymphocyte ratio	2.5 ± 0.8	4.7 ± 3.7	<0.0001
GENSINI score	16 ± 18	53 ± 33	<0.0001
Syntax score	6.1 ± 6	17 ± 9	<0.0001
TIMI Grade	3.0 ± 0.3	2.8 ± 0.5	0.1
Troponin	157 ± 116	1838 ± 330	0.0001
Ejection Fraction	55 ± 1.6	45 ± 1.9	0.0003
MACE at six weeks	4.5%	9.4%	0.4

MACE in the stable angina cohort. In both groups NLR did not correlate with overall plaque burden.

Conclusion NLR of greater than 4.5 was a predictor of MACE at six weeks in STEMI patients. This inexpensive and widely available marker may be incorporated into standard models of risk prediction in STEMI.

38 THE OUTCOMES OF PATIENTS POST CARDIAC ARREST IN THE PRIMARY PCI ERA: THE ST JAMES EXPERIENCE

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Introduction Ischaemic heart disease is believed to account for 60–70% of cardiac arrests, particularly in adults. Since the commencement of the national primary PCI programme, there is increased access to angiography in patients with return of spontaneous circulation (ROSC) post cardiac arrest. The decision to proceed with angiography can be challenging in this cohort as it is often difficult to determine candidates suitable for primary angiography for several reasons; non-specific electrical morphology on electrocardiogram post-arrest, sluggish myocardial contractility often seen in patients on echocardiography after ROSC, the difficulty in determining the degree of hypoxic encephalopathy in the acute setting and the challenge in identifying the aetiology for the cardiac arrest initially. This study aimed to identify the patients presenting to the emergency department with out of hospital cardiac arrest over a two year period, and describe associated outcomes in the 'primary PCI' era.

Methods Retrospective cohort analysis was conducted on attendances to the emergency department of St James hospital, Dublin between January 2014 and February 2016. Emergency department records were collated with hospital inpatient enquiry (HIPE) records to identify patients presenting with cardiac arrest. Electronic and paper charts were used to source patient-level data. Standard parametric multivariate analysis was performed.

Results Over the 109, 854 emergency department attendances during the study period, 290 patients presented with cardiac arrest (0.26%). Average age on presentation with cardiac arrest was 65, and the male-female ratio was observed at 2:1. 52 patients (17.9%) survived to admission from the emergency department. Of the patients surviving arrest, 23 (44.2%) underwent emergency angiography; 52.2% within 90 minutes, 78% within 6 hours and 82.6% within 24 hours. 15 (65.2%) patients required primary PCI. 60.9% of patients undergoing angiography survived to discharge, whereas 24% of the group not undergoing angiography survived to discharge. This is a reflection on angiography not being performed on patients with poor expected outcomes. There was a trend towards increased survival in the patients not requiring PCI which was not significant (53.3% versus 71.4%, $p = 0.14$), and this again reflects the increased comorbidity burden of those requiring PCI. Compared with STEMI patients within the same St James Hospital population (mean reperfusion time 116 mins) patients requiring reperfusion had a significantly longer time to reperfusion (263 mins) $p = 0.0022$.

Conclusion Out of hospital cardiac arrest was associated with a total mortality of 91% in this cohort. In carefully selected patients post cardiac arrest, a high percentage (65.2%) required PCI. Patients with out of hospital cardiac arrest requiring revascularisation had a longer time to reperfusion than STEMI patients.

39 MINISTERNOTOMY FOR AORTIC VALVE REPLACEMENT-IS IT SAFE AND EFFECTIVE?

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10.1136/heartjnl-2016-310523.39

Background Surgical aortic valve replacement has been shown to be an extremely safe and effective operation. In order to reduce patient morbidity, we recently commenced a ministernotomy approach to the aortic valve.

Methods Between 2012 and the present 90 aortic valve replacements have been performed using this less invasive technique. Age ranged from 33 to 87 years. The technique involved partial sternotomy of 7–8 cm with a 'J' to the left. Cardiopulmonary bypass was established with low profile cannulae, and the replacement of the aortic valve proceeded with a standard surgical technique in 82 patients and with a sutureless rapid deployment valve in 6 patients.

Results 30 day mortality was 0%, 4 patients required conversion to full sternotomy. One patient had reoperation for bleeding post surgery. All patients were discharged well.

Conclusions Aortic valve replacement via a ministernotomy is a safe and effective procedure.

40 THE FIRST IRISH MINIMALLY INVASIVE MITRAL REPAIR CASES

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10.1136/heartjnl-2016-310523.40

The first five minimally invasive mitral surgery cases are reported. Age range was 69 to 76 years, two ladies and three men; all had degenerative mitral regurgitation and all valves were repaired using standard Carpentier principles. All were performed through a 5 to 8 cm skin incision, right anterolateral thoracotomy and cardiopulmonary bypass established via the femoral vessels. All patients were discharged within 6 days. No patient had residual mitral regurgitation on discharge and there was no morbidity of note in any of the patients. Minimally invasive surgery is a safe alternative to conventional open surgery when performed by an experienced mitral surgeon with appropriate training in minimal techniques.

41 RENAL INSUFFICIENCY, BLEEDING AND PRESCRIPTION OF DISCHARGE MEDICATION IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION IN THE NATIONAL HEART, LUNG, AND BLOOD INSTITUTE (NHLBI) DYNAMIC REGISTRY

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10.1136/heartjnl-2016-310523.41

Aims To establish the relationship between renal insufficiency, bleeding and prescription of cardiovascular medication.

Methods and results This was a prospective, multi-centre, cohort study of consecutive patients undergoing PCI during three NHLBI Dynamic Registry recruitment waves. Major and minor bleeding, access site bleeding and rates of prescription of cardiovascular medication at discharge were determined based on estimated glomerular filtration rate (eGFR). Renal insufficiency was an independent predictor of major adverse cardiovascular events (MACE). Bleeding events and access site bleeding requiring transfusion were significantly associated with degrees of renal insufficiency ($p < 0.001$). There was an incremental decline in prescription of cardiovascular medication at discharge proportionate to the degree of renal impairment (aspirin, thienopyridine, statin, coumadin (overall $p < 0.001$), beta blocker (overall $p = 0.003$), ACE inhibitor (overall $p = 0.02$). Bleeders were less likely to be discharged on a thienopyridine (95.4% versus 89.9% for bleeding, $p < 0.001$ and 95.3% versus 87.9% for access site bleeding, $p = 0.005$), but not aspirin (96.3% versus 96.2%, $p = 0.97$ and 96.3% versus 93.6%, $p = 0.29$ respectively). Failure to prescribe anti-platelet therapy at discharge was strongly associated with increased MACE at one year.

Conclusions Renal insufficiency predicts bleeding in patients undergoing PCI. Patients with renal insufficiency are less likely to receive recommended discharge pharmacotherapy.

General Poster Session 2

42 OUTCOME OF PRIMARY PCI IN OLDER POPULATION

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10.1136/heartjnl-2016-310523.42

Introduction STEMI is a leading cause of mortality. Several factors are associated with poor outcome. One of the major factors is increasing age. In this brief report we highlight the mortality and the characteristics of elderly patients (above 75 years of age) who presented with STEMI to our PCI centre.

Methods A retrospective review of clinical records of all patients who presented to PCI centre in University Hospital Limerick in the period from January to December 2014. Patients were allocated into two groups according to their age at time of presentation with group 1 representing patients who were 75 year-old or older, and group 2 included patients who were younger than 75 year-old.

Results Total of 223 patients were reviewed. 184 patients had confirmed diagnosis of STEMI. Primary PCI was performed in 182 patients and they were included in this analysis.

Group 1 (above 75-year old) included 49 patients (26.9%) while group 2 (<75 years old) included 133 patients. Females represnted 45 patients (24.7%). In hospital mortality in the first group was 18.4% (9 patients) while mortality in in the second group was 0% ($P = 0.0001$). The median length of stay (LOS) was 3 days in the first group vs 4 days in the second group ($P = 0.45$). Percentage of patients who presented with cardiac arrest on admission was 6.1% in first set of patients in comparison to 11.2% in the second group ($P = 0.45$). LAD obstructive pathology was identified as culprit lesion in 47.8% of the first group against 41.8% in the second set of patient ($P = 0.56$). Low EF (EF <40%) was 51% in first cohort of patients and 36.8% on the second group ($P = 0.2$). The use of IABP in the group 1 and group 2 was 16.3% and 13.2% respectively ($P = 0.64$).

Conclusion While the utilisation of primary PCI service by the elderly population in our centre has shown high proportion (26.9%), the mortality was extremely high. Important characteristics were included in this analysis; notably EF, use of IABP and cardiac arrest on admission to reflect clinical status on presentation. All theses parameters failed to show significant difference. For example the presence of cardiac arrest was noted to be higher in younger patients. This finding points to the fact that, the striking difference in mortality is probably due to other factors not analysed in this report. Increasing age is associated with increased medical co-morbidities. For complete understanding of the risks for mortality in this age group multivariate analysis with consideration of more variables is needed.

43 UNDER UTILISATION OF THROMBOLYSIS IN THE NATIONAL ACS PROGRAMME: THE ST JAMES EXPERIENCE

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10.1136/heartjnl-2016-310523.43

Optimal reperfusion in STEMI is the key goal of the National ACS programme. The aims of the programme are a diagnosis to door time (DDT) of <90 minutes and a reperfusion time (RT) of <120 minutes, with a goal of Primary PCI (PPCI) as the method of reperfusion in 80% of STEMIs. Thrombolysis is an important reperfusion strategy where primary PCI cannot be offered to STEMI patients within recommended timelines. The aim of this study was to examine the number of patients outside the recommended time goals being referred to St James from other hospitals and hence to estimate the potential patient cohort that should be considered for thrombolysis prior to transfer to the Primary PCI centre.

We used the Code STEMI database collected prospectively and HIPE data to identify our patient cohort. From January to December 2015 487 patients in total were identified as diagnosed with a STEMI or transferred to St James as part of the National ACS programme. Looking at all-comers; 222 (45%) were transferred from another hospital, 206 (42%) from the field, 29 (6%) from our ED. The average DDT of the patients from outside hospitals was 141 minutes (median 110, range 18–798), 63% were outside the 90 minutes DDT. The average RT was 148 minutes (median 128, range 25–599), 57% of the patients were outside

the recommended 120 minutes for RT. Only 7 patients (1.4%) were thrombolysed prior to transfer.
There are inevitable delays when arranging transfer of Code STEMI patients from an outside hospital to the primary PCI centre. It is expected that a proportion of patients will have to undergo thrombolysis as the initial reperfusion strategy. The data we collected in the largest PPCI centre in the country highlights that thrombolysis is being under-utilised and needs to be considered in all inter-hospital STEMI transfers.

44 MULTI-VESSEL PCI IN STEMI AFTER THE PRAMI TRIAL: THE IRISH EXPERIENCE

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Prior to the publication of the PRAMI trial the guideline recommendation was to only undertake culprit vessel PCI at the time of Primary PCI (PPCI) in the management of ST elevation myocardial infarction (STEMI). The guidelines advocated a staged PCI approach. The benefit of non-culprit PCI at the time PPCI is now widely accepted in the post PRAMI era.
We reviewed all patients that underwent PPCI for STEMI in St James in 2015 to examine our practice in this regard. We recorded the number of patients that underwent multi-vessel PCI (MVPCI) at the time of infarct artery PCI compared with the group that underwent staged PCI and those referred for CABG. We looked at different parameters that may affect decision-making at the time of PPCI such as primary operator and 'on-call hours' to see if these variables influenced the decision to proceed or wait. Patient mortality and length of stay (LOS) were also compared between the groups.
We used the Code STEMI database and HIPE data to identify our patient cohort, with review of the patient chart to verify missing details.
In 2015 there were 487 patients diagnosed with a STEMI in SJH or transferred to St James as part of the National ACS programme (average age 62.2 years (range 23–91), 25% female). There were 407 (83.6%) patients with a confirmed diagnosis of STEMI, either clinically or angiographically (average age 62.4 years, 25% female). 375 (77%) had PPCI (average age 61.5 years, 23% female). 53 patients had MVPCI at the same time as PPCI (14%, average age 61, 21% female). 58 had staged PCI (15%, average age 62, 17% female); 18 as an inpatient, 36 as an outpatient and for 4 patients it was recommended on repatriation to a PCI centre. LOS in those not repatriated to their local hospital was 8.4 days (median 6.8, range 4.4–17.7) in MVPCI and 8.3 (median 6.3, range 3.3–26.2) in the staged PCI group. The MVPCI group had an inpatient mortality of 3.7% (2 patients), there were no recorded deaths in staged PCI subgroup. The majority of all the cases were performed during 'on-call hours'; MVPCI 64.5% and staged 61.4%. Out of 10 primary operators only one displayed a statistically significant preference for MVPCI versus staged PCI ($p < 0.01$), and one the opposite ($p = 0.01$). We referred 17 patients for CABG, 8 having no intervention prior to CABG, 9 following POBA or PCI.
In the largest Irish PPCI centre we found the number of patients undergoing non-culprit vessel PCI at the time of PPCI is much larger than those undergoing inpatient staged PCI. There was no reduction in length of stay in our cohort. The prolonged LOS and the mortality rate may reflect the more complex disease in the cohort undergoing MVPCI and also reflect that this is real-life data including patients in cariogenic shock and post cardiac arrest.

45 INTRAVASCULAR ULTRASOUND GUIDANCE OF PERCUTANEOUS CORONARY INTERVENTIONS IN OSTIAL CHRONIC TOTAL OCCLUSIONS

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10.1136/heartjnl-2016-310523.45

Background Inability to cross the lesion with a guidewire is the most common reason for failure in percutaneous revascularisation (PCI) of chronic total occlusions (CTOs). An ostial or stumpless CTO is an acknowledged challenge for CTO recanalisation due to difficulty in successful wiring. IVUS imaging provides the opportunity to visualise the occluded vessel and to aid guidewire advancement. We review the value of this technique in a single-centre experience of CTO PCI.
Methods This series involves 22 patients who underwent CTO-PCI using IVUS guidance for stumpless CTO wiring at our institution. CTO operators with extensive IVUS experience in non-CTO cases carried out all procedures. Procedural and outcome data in this population was prospectively entered into the institutional database and a retrospective analysis of clinical, angiographic and technical data was performed.
Results 17 (77%) of the 22 procedures were successful. The mean age was 59.8 ± 11.5 years, and 90.9% were male. The most commonly attempted lesions were located in the Left Anterior Descending (LAD) 36.4% (8) and Circumflex artery (LCx) 31.8% (7). Mean JCTO score was 3.09 ± 0.75 (3.06 ± 0.68, 3.17 ± 0.98 in the successful and failed groups respectively $p = 0.35$). The mean contrast volume was 378.7 ml ± 114.7 (389.9 ml ± 130.5, 349.2 ml ± 52.2 $p = 0.3$ in the successful and failed groups respectively). There was no death, coronary artery bypass grafting or myocardial infarction requiring intervention in this series. When the success rates were analysed taking into account the date of adoption of this technique, the learning curve had no significant impact on CTO-PCI success.
Conclusions This series describes a good success rate in IVUS guided stumpless wiring of CTOs in consecutive patients with this complex anatomical scenario.

46 GROUPING OF PROCEDURES IMPROVES CATHETERISATION LABORATORY EFFICIENCY – A SINGLE CENTRE EXPERIENCE

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10.1136/heartjnl-2016-310523.46

Introduction Improving Catheterisation Laboratory efficiency is the aim of all Cardiology Departments. Marrying efficiency with patient satisfaction is often challenging. Implantable loop recorder (ILR) insertion is a common procedure in our institution. To date, most ILR implantations have taken place on an ad hoc basis. We had long surmised that procedure efficiency could be improved by grouping implants on the same day without compromising patient experience. Our study aimed to prove this theory using ILR as an index procedure.

Methods Two half-days were set aside for implantation. Patients were unselected and taken from the waiting list. All implants were planned as day cases. 12 were planned for day 1 and 18 for day 2. Patients were admitted to the cardiology day ward (CDW) on the morning of the procedure. Antibiotics and paracetamol were administered as per protocol. Patient education, given by the CDW nurses, included pros and cons of sedation, the method of implantation and wound care. Home monitoring education was given by the manufacturing company representative. A team meeting including the Consultant, Nursing staff, and Cardiac Physiologists took place after the first day to highlight possible changes for day 2. On both days all patients were asked to complete a questionnaire regarding their experience.

Results 11 patients were implanted and one had device removal on day 1 with 14 implants and 4 removals on day 2. The average age was 57. Indications were syncope (13), palpitations (9) and stroke (3). All patients opted to have no sedation. All procedures were carried out by a single operator. The average procedure duration was 8 minutes (range 4–15 minutes). All patients were discharged from the CDW within 30 minutes following the procedure. Following the team meeting on day 1, it was decided that paracetamol should be administered orally rather than intravenously, procedure packs were pre-prepared and further improvements in CDW utilisation were made. This resulted in further improvement in the time taken per patient from admission to discharge. All implants had adequate p wave and r wave amplitudes as per manufacturers recommendations. No patients were readmitted with device related complications. 93.3% of patients returned their patient experience questionnaire. 100% were overall satisfied with the service. 100% either strongly agreed, or agreed, that their stay was completed in a timely and efficient manner. 100% either strongly agreed, or agreed, they were treated respect at all times and 100% either strongly agreed, or agreed, that they were satisfied with discharge information received.

Conclusion Continuous appraisal of CDW and catheterisation lab patient flow highlights areas of inefficiency. Our study demonstrates that improvements can be made by grouping procedures on a single day. Numerous factors contributed to the success of our study including clearly defined roles for staff, good patient education, involvement of device manufacturers representatives and having the procedure performed by a single primary operator. The high levels of patient satisfaction with the care they received, proves that increased efficiency does not have to compromise patient experience.

47 A COMPARISON OF TWO ALGORITHMS IN THE PREDICTION OF ACCESSORY PATHWAY LOCALIZATION IN CHILDREN WITH WOLFF-PARKINSON-WHITE

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10.1136/heartjnl-2016-310523.47

Introduction Several algorithms have been developed to predict the localization of the accessory pathways (AP) in patients with Wolff-Parkinson-White (WPW). The majority of these have focused on accessory pathways in the adult population. Boersma *et al*. developed an algorithm specifically designed for the paediatric population.

Aim We aim to compare the accuracy of predicting the localization of the AP using the adult algorithm according to d'Avila *et al*. and the paediatric algorithm by Boersma. Both algorithms are based on QRS polarity.

Method We present our single centre experience of children with WPW. The data was collected retrospectively from April 2007 to November 2015. Patients aged <18 years with documentation of pre-excitation on a 12 lead resting ECG and with eminent evidence of an accessory pathway on electrophysiological study (EPS) were included. Patients with concealed accessory pathways (i.e., retrograde conduction) were excluded. The ECG was analysed blinded from EPS results. The primary outcome concerns an exact match between the predicted localization and site of ablation, but because both algorithms describe different categorization for AP localization, an agreement was made on which localizations could be accepted as a match in a secondary analysis. Since Boersma's algorithm points out multiple possible localizations, a match was accepted if any one of these sites corresponded with localization on EPS.

Results Inclusion criteria were met for 36 patients. Sixty-nine percent of the patients were boys. Median age was 13 years (4–18 years). The algorithm by Boersma provided an exact match in 29 patients (80%) while the one by d'Avila only provided an exact match in 24 patients (66%). If we expand our match as previously described, the accuracy of the algorithm by d'Avila augments to 75%.

Conclusion The algorithm by Boersma provided a more correct, though less detailed localization of the AP in 80% of this paediatric population. Using the more detailed adult algorithm by d'Avila this result was almost equaled on condition that we accepted some previously agreed sites as a match.

48 USE OF AMIODARONE FOR DIRECT CURRENT CARDIOVERSION – A FIVE YEAR STUDY

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10.1136/heartjnl-2016-310523.48

Background Despite sub-optimal long-term results DC electrical cardioversion (DCCV) remains a main stay in atrial fibrillation (AF) management. In selected patients long-term success at 6 weeks is approximately 50%. Amiodarone has been shown to be effective in maintaining normal sinus rhythm (NSR), as demonstrated in the AF-CHF trial, in which NSR in the rhythm control arm after 5 years was approximately 80%.

Methods We aimed to assess amiodarone efficacy in maintaining NSR post DCCV at our centre from January 2008 to December 2013. Through retrospective chart analysis we identified patients undergoing first DCCV within this time period. Patients were followed up at 6 weeks and 6 months. Medication changes and rhythm status were documented. Baseline characteristics, medications and length in AF pre-DCCV were documented. Safety profile was determined.

Results 152 patients underwent DCCV within this time period; 129 on amiodarone, 5 on alternative anti-arrhythmic, and 18 off anti-arrhythmic. 7.89% patients had a history of MI, 15.13% a history of PCI and 5.28% had a history of CABG. Average AF duration was 15.5 months. 19.7% and 7.2% of patients had moderate and severe left ventricular dysfunction respectively. At 6 weeks 64.4% patients on amiodarone were in NSR versus 33.3% not receiving such ($p = 0.023$). At 6 months 51% patients on amiodarone were in NSR versus 16.67% not receiving such ($p = 0.081$). 7 patients suffered thyroid dysfunction, and 4 patients suffered LFT derangement.

Conclusion In an unselected high risk population the addition of amiodarone suggests improved long-term outcomes, with good drug tolerance. This data suggests a larger randomised control trial of amiodarone-facilitated DCCV may be warranted.

49 THE ROLE AND IMPACT OF A PHARMACIST IN A MULTI-DISCIPLINARY A TRIAL FIBRILLATION CLINIC

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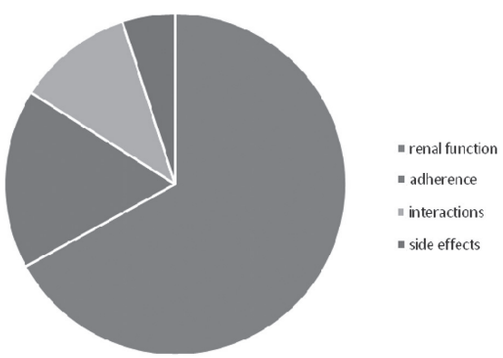
10.1136/heartjnl-2016-310523.49

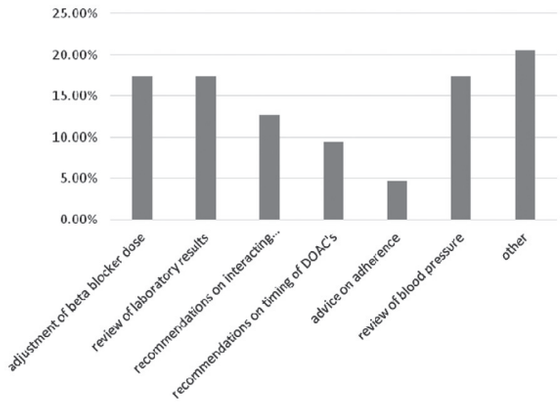
Introduction Tallaght Hospital assesses and admits over 400 patients with a primary and 2,100 patients with a secondary diagnosis of atrial fibrillation (AF) including almost 100 of our acute strokes. Almost all patients require primary and secondary prevention with anticoagulation. An interdisciplinary (Cardiology, Geriatric Medicine and Pharmacy) AF clinic was set up to ensure effective gold standard treatment of AF. Importance of pharmacy in multidisciplinary clinic was identified early for patients using direct oral anticoagulants (DOACs) and other cardiac drugs as medications for AF often have complex dosing schedules, many drug interactions and important counselling points which are most suitably managed by a pharmacist. The aim of this study was to look at the number of interventions made by the pharmacist on the dose or selection of anticoagulation treatment and the number of secondary interventions made.

Methods A treatment protocol was drafted and approved, highlighting the scope and framework for the pharmacist's involvement and their practising framework. A data collection form was designed based on guidance issued from the European Heart Rhythm Association (EHRA) and guidelines from European Society of Cardiology (ESC) for the Management of Atrial Fibrillation. Interventions were included if they were agreed and acted on by the cardiologist in the clinic. Data was analysed using Microsoft Excel.

Results To date 125 patient consultations were carried out by the pharmacist and the cardiologist. 15% of consultations by pharmacist resulted in a change of anticoagulation for the patient. These recommendations arose from issues such as changes in renal function, drug interactions and poor adherence. 50% of consultations by pharmacist resulted in secondary interventions Recommended.



Abstract 49 Figure 1 Reason for adjustment of anticoagulation choice



Abstract 49 Figure 2 Secondary interventions recommended

Conclusion The high rate of interventions both on anticoagulation and rate control emphasises the importance of the AF clinic as a whole and the importance of pharmacist involvement. An audit on pharmacist interventions in this clinic will continue to strengthen the evidence for this role.

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50 INSERTABLE CARDIAC MONITORS TO DETECT AF IN "CRYPTOGENIC STROKE"

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10.1136/heartjnl-2016-310523.50

Background Ischaemic stroke is a major cause of morbidity and mortality. The aetiology remains undetermined in 20–40% even after costly routine evaluation. This results in a diagnosis of exclusion of cryptogenic stroke. Atrial fibrillation (AF) confers a five-fold risk of ischaemic stroke and one in five of all strokes is attributed to this arrhythmia, undiagnosed silent AF is a likely cause of some cryptogenic strokes. The recent Crystal Trial demonstrated 8.9% detection of AF in the follow up of patients with a prior diagnosis of crytptogenic stroke with an insertable cardiac monitor. The ESC guidelines suggest that consideration should be given to insertion of a cardiac monitor in certain high risk patients presenting with a non- debilitating stroke and in whom a high index of suspicion exists for the presence of silent AF. In Ireland, the annual cost of stroke is estimated to be 489–805 euro million, with direct costs accounting for 2–4% of total health expenditure. Using demographic changes alone, with stroke incidence and prevalence kept constant, annual cost is estimated to increase by 58% from by 2021 to be between 743 and 1266 million euro. Preventative measures do exist including smoking cessation, reducing alcohol consumption, physical inactivity, diabetes and obesity. The reassessment of high risk patients with a previous diagnosis of cryptogenic stroke by confirming silent AF and initiating appropriate oral anti-coagulation may prevent more debilitating future strokes, further reducing the impact on quality of life. Cost benefit analysis have demonstrated the effectiveness of this intervention.

Method This was a single centre prospective study commenced in January 2014 and is currently ongoing. Ethical approval was obtained from the hospital ethics committee. High risk patients with a non debilitating stroke were assessed for suitability for inclusion by the stroke team. Patients were high risk based on the presence of cardiovascular risk factors and a confirmed ischaemic stroke on MR brain imaging. A non-debilitating stroke was defined as Rankin score of less than or equal to 2. All patients had completed the standard work up for ischaemic stroke and carried a diagnosis of cryptogenic stroke.

Results In our single centre prospective experience 52 high risk patients, with a non debilitating ischaemic stroke, were selected for insertable cardiac monitoring to detect silent AF. Twenty patients (40%) were found to have silent AF. The mean age was 72.9 years. The average CHADSVAC score was 6. The mean time to diagnosis of AF was 2.9 months. Appropriate oral anticoagulation was initiated in all patients in whom AF was detected. No patient in this study has had a further stroke event.

Conclusion In this single centre experience our results are in keeping with previous studies that demonstrate that in highly selected patients cardiac monitoring can be utilised to capture silent AF and to initiate appropriate therapy.

51 CORONARY SINUS AS PREDICTOR OF ATRIAL FLUTTER IN PATIENTS WITH NARROW COMPLEX TACHYCARDIA

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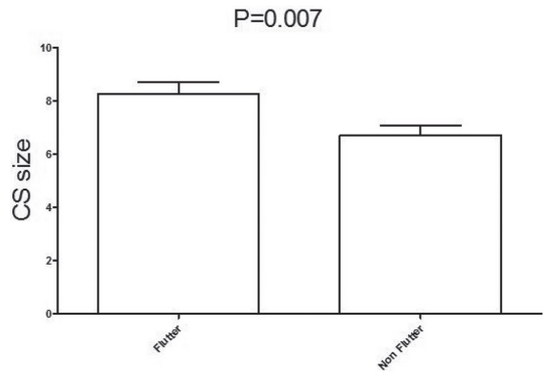
10.1136/heartjnl-2016-310523.51

Introduction Manoeuvres such as Valsalva or adenosine injection are routinely applied in patients presenting with narrow complex tachycardia (NCT). However, such manoeuvres could not be applied in short burst of NCT on telemetry or holter monitoring. Thereby, precise diagnosis of the underlying rhythm may not be identified until invasive electro physiology study is performed. Such delays, potentially for few weeks, may put patients with undiagnosed atrial flutter at significant risk of developing thromboembolism. Therefore, other tools are needed to aid diagnosis and potentially management of NCT. We sought to establish whether coronary sinus measurement (diameter) would prove to be a useful predictor for the diagnosis of atrial flutter for patients with NCT.

Methods A retrospective analysis of all consecutive patients who were referred to invasive electro physiology study following an episode of NCT between April 2013 and March 2014. CS size was measured blindly from EPs results and was recorded in end diastole using transthoracic echocardiography. Patients were divided into two groups: atrial flutter and non-flutter group. Statistical analysis was performed using SPSS 22.0.



Abstract 51 Figure 1

Results Total of 90 patients were identified and coronary sinus was identified in 80% of patients. Pulmonary vein isolation cases were excluded from the analysis. Patients who have potential risk of developing thromboembolism i.e., CHA_2DS_2-VASc 1) were only included in this analysis. Mean age was 55 ± 21, 40.4% males with mean CS of 7.4 mm. There was no significant difference between the flutter and non-flutter groups in terms of right ventricle size and function, left ventricle ejection fraction, left ventricle end diastolic diameter, symptoms duration or CHA_2DS_2-VASc score. Atrial flutter group were are older and less likely to be females. They also have statistically significant larger coronary sinus (8.3 *versus* 6.7 mm, p = 0.007, Figure 1).

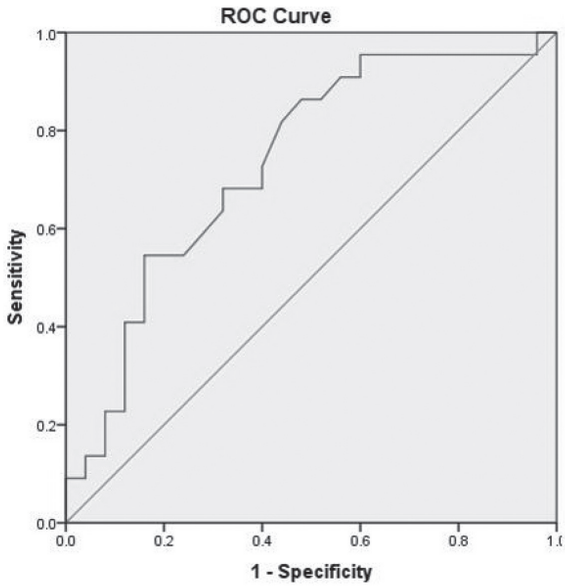
On univariable logistic regression analysis age, female gender, coronary sinus diameter and right atrial size were all predictors of atrial flutter (see Table). However, coronary sinus was the only independent predictor of atrial flutter diagnosis (OR 1.58, CI: 1.01–2.48, p = 0.046) using multivariable logistic regression analysis.

Receiver Operating Characteristic area under the curve was 0.74 (p = 0.006) for the mean coronary size diameter of 7.4 mm to identify the flutter group (see Figure 2).

Conclusion Coronary sinus might be a useful tool to predict atrial flutter in patients with NCT who are at risk of developing thromboembolism. It is a non-invasive simple marker which could be measure using echocardiogram.

Abstract 51 Table 1 Analysis

	Univariable analysis		Multivariable analysis	
	OR (95% CI)	*P value*	*OR (95% CI)*	*P value*
Age	1.06 (1.02–1.11)	**0.004**	1.05 (0.99–1.10)	0.074
Female gender	0.22 (0.06–0.76)	**0.017**	0.59 (0.11–3.01)	0.522
Ejection fraction	0.94 (0.86–1.03)	0.18	–	–
Left ventricle end diastolic diameter	1.16 (0.38–3.57)	0.8	–	–
Right atrium size	9.58 (1.8–50.96)	**0.008**	4.46 (0.65–30.7)	0.129
Right ventricle size	7.35 (0.79–68.6)	0.08	0.04 (0.001–1.31)	0.071
Right ventricle systolic pressure	1.06 (0.99–1.14)	0.086	1.025 (0.93–1.13)	0.616
CS	1.58 (1.1–2.28)	**0.015**	1.58 (1.01–2.48)	**0.046**



Abstract 51 Figure 2

52 ADHERENCE TO THE ESC 2013 CARDIAC PACING GUIDELINES

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10.1136/heartjnl-2016-310523.52

Background The advent of permanent pacemakers and implantable defibrillators in the mid-to-late 20th century called for a standardised set of guidelines outlining the appropriate use of this technology. This audit proposed to identify the adherence to the 2013 ESC Practice Guidelines over a one-year period in a single tertiary referral centre.

Methods This study was performed in University Hospital Galway. All patients who underwent a new pacemaker/ICD insertion or a box change of an existing device within the one-year period of January 1st 2015 to December 31st 2015 were included. Information on the documented indication for the pacemaker/ICD insertion was obtained through discharge summaries, medical charts and catheterisation lab record reviews, as well as from the pacing registry G-Pace.

Results 292 patients were included (69.2% male) with an average age of 74.24 ± 14.055 years. 188 pacemaker and 42 ICD implantations were performed with 62 box changes for existing devices. 199 (68.2%) were referrals from within the centre, and 93 patients (31.8%) were transfers from another hospital. A total of 105 (36.0%) procedures were elective, and 187 (64.0%) non-elective insertions were performed as an inpatient.

Of the 292 patients included in the study, 248 (84.9%) had Class I indications, 30 (10.3%) had Class IIa indications, 5 (1.7%) had Class IIb indications, 5 (1.7%) had Class III indications, and 3 (1.03%) were unknown (all of whom presented for elective box changes). The Class III indications included recurrent syncope, bifascicular block, and trifascicular block, without definite symptoms. 1(0.3%) patient had a Class II indication under the ACC/AHA guidelines, as they did not fall within the scope of the ESC guidelines. A full table of pacemaker indications can be found in table 1.

Abstract 52 Table 1 Indications by ESC 2013 classification

Indication	n
Class I Indications	
Complete Heart Block	67
Severe Left Ventricular Failure (EF 535%)	39
Second Degree Type II Heart Block	39
Sick Sinus Syndrome	33
Atrial Fibrillation – Class I Indications	25
Secondary Prevention: Ventricular Fibrillation Arrest	7
CRT-D: Left or Right Bundle Branch Block	6
Secondary Prevention: Sustained Ventricular Tachycardia	5
Long QT Syndrome/Torsades de Pointes	2
Carotid Sinus Hypersensitivity	1
Ventricular Standstill	1
Paroxysmal Atrial Fibrillation	4
Brugada Syndrome	2
Symptomatic Sinus Arrest/Pauses >6 seconds	14
Secondary Prevention: Non-Sustained Ventricular Tachycardia	3
	248
Class II Indications	
Atrial Fibrillation – Class II Indications	17
Symptomatic Sinus Bradycardia	4
Hypertrophic Cardiomyopathy – Primary Prevention	4
Symptomatic Heart Block	5
Hypertrophic Cardiomyopathy – Secondary Prevention Ventricular Tachycardia	3
Sinus Node Dysfunction	1
Symptomatic First Degree Heart Block	1
PPM: Left or Right Bundle Branch Block	1
	36
Class III Indications	
Trifascicular Block	2
Syncope	2
Bifascicular Block	1
	5
Other	
Unknown	3
TOTAL	**292**

Conclusion This audit shows a 96.9% adherence rate to the 2013 ESC Guidelines with those devices inserted for Class I/IIa/IIb indications. With the potential complications associated with cardiac devices, adherence to these guidelines is essential in minimising morbidity for the patient and maximising the use of healthcare resources. This audit demonstrates that the ESC Guidelines have been successfully integrated into practice.

53 INCIDENCE OF PACEMEKER DEVICE INFECTION: FIVE YEAR DATA FROM A SINGLE CENTRE

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10.1136/heartjnl-2016-310523.53

Background Infections related to pacemakers (PPM) are increasing in incidence because more devices are being implanted. Strategies for prevention including anti microbial prophylaxis and managing PPM infections vary widely. Evidence to guide practice is limited. The only published guidelines in this area until recently were from the American Heart Association in 2010. Recent joint guidelines from the British Society of anti-microbial Chemotherapy, British Heart Rhythm Society, British Cardiovascular Society, British Heart Valve Society and British Society of Echocardiography promote a standardised approach to this important and increasing clinical problem. The new guidelines recognise the paucity of data and recommend prospective collection of infection rates at 6 months, 1 and 2 years (as well as per 1000 device-years) to define the baseline incidence of PPM infection against which future data could be compared. The Irish incidence of PPM infection is unknown. Extrapolating international estimates may be inappropriate due to varying case definitions and measures of incidence. Acknowledging variable follow-up periods and definitions of infection the international literature suggests an overall incidence of infection of 0.5%–2.2% of implants. There are higher incidence of infection for ICD/CRT compared with PPM and redo procedures compared with primary implants.
Method This was a single centre retrospective study looking at the incidence of PPM infection. Ethical approval was obtained from hospital ethics committee. Hospital records were reviewed and in the case of uncertainty the patient was contacted directly.
Result Between January 2010 and December 2015 there were 439 PPM inserted. There were 203 dual chamber devices and 236 single chamber devices. There were 4 (0.9%) PPM infections requiring device removal. Three of the patients were male. All were primary implant. Three of the devices were dual chamber. Two of the patients had chronic kidney disease. One patient had diabetes. There were 6 (1.3%) cases of cellulitis within 6 weeks of insertion and treated successfully with oral flucloxacillin. In May 2012 antimicrobial prophylaxis was changed from flucloxacillin to Zinacef. No increase in infection incidence was noted. In all cases of device infection procedure time was noted to be >60 minutes.
Conclusion These findings are consistent with international figures of infection rate of 1.1%. Although the numbers are too small to make any significant conclusion it is interesting to note that prolonged procedure time, chronic kidney disease and diabetes were factors present in this group of patient, all of which are known risk factors for device infection.

54 ICD DEACTIVATION AT END OF LIFE IN NORTHERN IRELAND 2013–2015

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10.1136/heartjnl-2016-310523.54

Background ICD patients may later develop a terminal illness. Concurrent hypoxia, sepsis, pain, heart failure and electrolyte disturbances may predispose shocks in final days of life which is distressing to both patients and their family. A previous audit within the Belfast Trust examined 44 patients with ICDs who died between 2012–2013 in which 16 (36.4%) had device deactivated pre-death. Our aim was to re-audit this for all Northern Ireland between 2013–2015.
Methods All patients who died with an ICD/CRT-D in situ between Sept 2013–Nov 2015 were included. Medical notes/and hospital electronic records were reviewed and patient and device characteristics recorded.
Results In total, 227 patients died with an implantable cardioverter defibrillator (ICD) in situ. Of these, 89 (39.2%) patients had their device deactivated prior to death to prevent inappropriate shock therapy, whilst 138 (60.8%) died with an active ICD in situ. Of the 138 that died with an active ICD: 17 (12.3%) had a diagnosis of a cancer for palliation only, a further 28 (20.3%) were being managed palliatively for non-cancerous conditions either in hospital or in the community and 7 (5.1%) patients were classified as having significant cognitive impairment. In this group ICD was mentioned in the most recent medical correspondence in 39 (28.2%). Overall, 65 (48.1%) had previously received a shock from their device, though previous history of shock did not influence likelihood of device deactivation ($p = 0.665$).
Conclusion Communication about ICD deactivation at end of life should be standard practice. More work is needed to ensure this occurs in an appropriate and timely manner.

55 COMPARISON OF LONGITUDINAL CHANGE IN SOLUBLE ST2 VERSUS B-TYPE NATRIURETIC PEPTIDE TO PREDICT MAJOR ADVERSE CARDIOVASCULAR EVENTS IN ASYMPTOMATIC PATIENTS IN THE COMMUNITY

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10.1136/heartjnl-2016-310523.55

Background Biomarker based preventative and monitoring strategies are increasingly used for risk stratification in cardiovascular (CV) disease. Natriuretic peptides and soluble (s)ST2 can identify patients at-risk of CV events. However, most of the existing reports focus on single time point analysis and in populations who have already exhibited major adverse CV events (MACE).
Objective The objective of this study was to investigate the utility of longitudinal change in B-type natriuretic peptide (BNP) and sST2 concentrations for predicting incident MACE (heart failure, myocardial infarction, arrhythmia, stroke/transient ischaemic attack and CV death) in asymptomatic community-based patients with risk factors but without prevalent MACE at enrolment.
Study design, size, and duration The study population consisted of 282 patients selected from within the longitudinal STOP-HF study of asymptomatic patients with risk factors for development of MACE. Fifty of these patients developed a MACE. The study was run in two phases comprising of an initial investigative cohort ($n = 195$) and a subsequent 2:1 (No MACE:MACE) propensity matched verification cohort ($n = 87$). BNP and sST2 were quantified in all patients at two time points a median of 2.5 years apart.
Results Fifty two subjects developed incident MACE. Longitudinal change in sST2 was a statistically significant predictor of incident MACE, with an area under the curve (AUC) for sST2 longitudinal change to predict incident MACE of 0.60 (95% confidence interval 0.52–0.68). A one-unit increment in sST2 change from baseline to follow up corresponded to approximately

7.99% increase in the rate of one or more incident MACE via Cox modelling, independent of the baseline or follow-up concentration. In contrast, longitudinal change value of BNP was not associated with MACE.
Conclusion Longitudinal change in sST2 but not BNP was associated with incident MACE in asymptomatic, initially event free patients in the community. Further work is required to evaluate the clinical utility of change in sST2 in risk prediction and event monitoring in this setting.

56 DIETARY NITRATE: A NOVEL BUT POTENT ANTIHYPERTENSIVE STRATEGY IN UNCONTROLLED HYPERTENSION AND OBSTRUCTIVE SLEEP APNOEA SYNDROME

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10.1136/heartjnl-2016-310523.56

Introduction Nitric oxide (NO) is a systemic- and pulmonary-vasodilator. NO synthesis in vivo can be facilitated by reduction of dietary nitrate (NO_3) to NO independent of NO synthase in a process that is upregulated under certain clinical conditions, possibly providing therapeutic effect. Multiple cardiorespiratory pathologies are associated with perturbations in NO, including uncontrolled hypertension (HTN) and obstructive sleep apnoea syndrome (OSAS). To extend findings from our preliminary studies, we hypothesised that dietary NO_3 may have utility in cardiorespiratory disorders associated with decreased NO bioavailability and elevated blood pressure (BP).
Methods We conducted 2 separate double-blind, randomised, placebo-controlled, crossover trials of daily NO_3supplementation as concentrated beetroot juice compared to matching nitrate-depleted beetroot juice placebo (PL) for 7 d among a group of well-characterised, uncontrolled hypertensives and subjects with newly diagnosed OSAS on ambulatory BP and biochemical parameters.
Results We recruited 20 uncontrolled hypertensives (mean age = 63 y, mean BMI = 31 kg/m^2, mean no. of antihypertensives = 2) as well as 12 adults with severe OSAS (mean apnoea-hypnoea index = 74, mean age = 52 y, mean BMI = 31 kg/m^2). Assessments were conducted on three occasions, baseline (day 1), midpoint, (day 8) and endpoint (day 15) – before and after each intervention period and included plasma nitrate as well as 24 h ambulatory blood pressure monitoring (Table 1).
Conclusions Daily dietary nitrate was well-tolerated, safe and led to increased plasma NO metabolites and decreased BP profiles in uncontrolled hypertensives and OSAS. Dietary nitrate has potential as a novel therapeutic, adjunct strategy in difficult to treat BP. Considering the low cost and safety profile of dietary nitrate containing foods and supplements, this concept appears promising as an adjunct therapeutic strategy for cardiovascular diseases.

Abstract 56 Table 1 Data

	Baseline	Post-NO3	Post-PL	P-value
#Nitrite (nM)	126	+578	+44	0.0017
#24 h SBP (mmHg)	137	−8	−4	0.0012
#24 h DBP (mmHg)	80	−4	−1	0.018
*Nitrite (nM)	65.5	+232	+13	0.0012
*24 h SBP (mmHg)	134	−6	−1	0.018
*24 h DBP (mmHg)	81	−2	−1	0.09
*Night SBP (mmHg)	127	−8	+1	0.045
*Night DBP (mmHg)	78	−6	−4	0.035

P-values are derived from paired t-tests of the difference between ΔNO_3 and ΔPL.
= HTN; * = OSAS

Brian Maurer Young Investigator Award

57 CAN A STRUCTURED INTERVENTION PROGRAMME IMPROVE THE BIOPHYSICAL AND PSYCHOSOCIAL WELLBEING IN CHILDREN WITH CONGENITAL HEART DISEASE?

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10.1136/heartjnl-2016-310523.57

Introduction Improved survival among children with congenital heart disease (CHD) has shifted focus to the long-term physical and psychological outcomes for these patients. There is evidence that children with CHD have lower levels of daily physical activity and a higher prevalence of obesity compared to their normal peers. The benefits of an active lifestyle within the general population have been well described. They include better cardiovascular health, improved psychological, cognitive and social functioning and obesity prevention. This study aims to determine if a structured intervention programme can improve both physical and psychological functioning in children with CHD.
Methods This study is a prospective randomised control trial. 430 patients aged between 5–10 years with CHD were identified on Heartsuite Database and invited to participate. Each patient underwent baseline biophysical and psychological assessment as detailed below:
Biophysical assessments
- Weight, height, waist measurements
- Baseline heart rate, blood pressure, oxygen saturation
- Exercise stress test – Graded cycle ergometer protocol
- Actigraph accelerometer worn for 1 week
- 3 day food diary

Psychosocial assessments
- Brief Symptom Index: To profile general mental health of the parent
- Kidscreen27
- Strengths and Difficulties Questionnaire
- Butler Self-image Profile

Following baseline assessment patients were randomised into intervention and control groups. The intervention group were invited to attend a one day education session during which motivational interviewing techniques were used to deliver advice on diet, exercise and positive lifestyle choices. They also received an individual written exercise plan to take home and implement. The control group continued with their usual level of care. After 4 months all participants were invited back for reassessment.
Baseline results
- 163 patients were recruited, 100 were male (61.3%) with a mean age of 8.4 years (range 5.3–11.5)
- Patient subgroups: 18.4% acyanotic no intervention, 37.4% acyanotic repaired, 27.6% cyanotic corrected, 16.6% cyanotic palliated

- EST: EST duration mean 5.89 mins (SD 2.02), METs mean 9.79 (SD 1.79), mean Maximal predicted HR 81% (SD 7.8)
- Actigraph: Average time spent in MVPA (Moderate-Vigorous Physical Activity) 45 mins (SD −27.2)
- The 'cyanotic palliated' subgroup had significantly lower EST duration, maximal HR and oxygen saturations at peak exercise compared with the other 3 subgroups, as well as significantly lower levels of daily MVPA
- The 'cyanotic palliated' group also scored significantly lower on HrQOL subscale, physical wellbeing

Conclusions The baseline assessments suggest that overall physical and psychological wellbeing is well preserved in the majority of children aged 5–11 years with CHD. The follow up results and impact of the intervention will also be presented.

58 PREDICTION OF CONTRAST INDUCED NEPHROPATHY USING NOVEL BIOMARKERS FOLLOWING ELECTIVE CONTRAST CORONARY ANGIOGRAPHY

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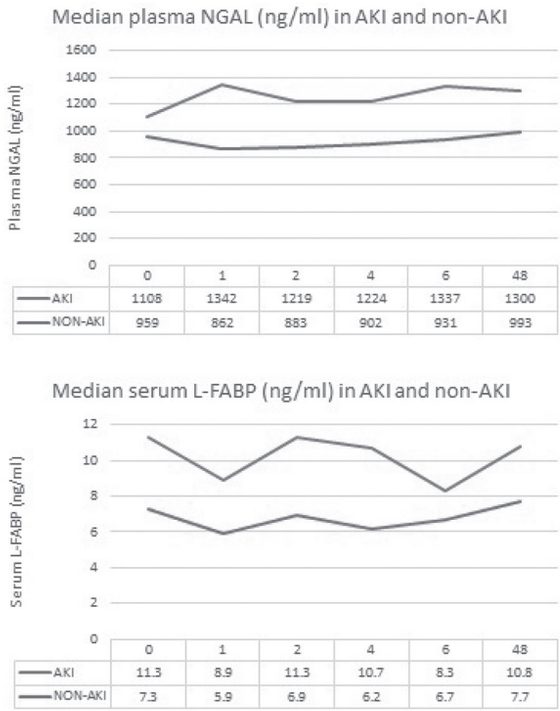
10.1136/heartjnl-2016-310523.58

Introduction Chronic Kidney Disease (CKD) is a risk factor for contrast induced nephropathy (CIN), defined as an increase in serum creatinine of >25% from baseline or a delta rise of >26.5µmol/L within 48 hours. Early diagnosis of acute kidney injury (AKI) associated with CIN requires validated novel biomarkers.

Methods A prospective observation study of 301 consecutive CKD patients undergoing elective invasive coronary angiography was performed. Low-osmolar contrast was standard. Demographics and Mehran risk score were recorded. Samples for plasma neutrophil gelatinase-associated lipocalin (NGAL), serum liver fatty acid-binding protein (L-FABP), serum kidney injury marker 1 (KIM-1), serum interleukin 18 (IL-18) and serum creatinine were taken at 0, 1, 2, 4, 6 and 48 hours post contrast. Urinary NGAL and urinary cystatin C (CysC) were collected at 0, 6 and 48 hours. Incidence of major adverse clinical events (MACE); acute myocardial infarction, heart failure hospitalisation, stroke and death were recorded at 1 year.

Results CIN occurred in 28 (9.3%) patients and were independently associated with older age, diabetes, higher Mehran score, larger contrast volume and anaemia ($p < 0.05$). Logistic regression analysis showed diabetes, CKD stage and GFR to be most predictive of CIN. The predictive power of plasma NGAL was greatest at 6 hours with median levels of 1,337 ng/ml in CIN patients compared with 931 ng/ml in non-CIN patients ($p = 0.002$, AUC 0.71, sensitivity 75.0%, specificity 96.1%, OR 2.86), see Figure 1 and Table 1. L-FABP performed best at 4 hours with median levels of 10.7 ng/ml in CIN patients compared with 6.2 ng/ml in non-CIN patients, $p = 0.001$, AUC 0.69, sensitivity 42.3%, specificity 90.2%, OR 6.75, Figure 1 and Table 1. Median urinary NGAL was higher only after 48 hours, 487 ng/ml in CIN patients versus 155 ng/ml in non-CIN patients, $p = 0.008$, AUC 0.63. CysC, IL-18 and KIM-1 were not predictive at any time-point ($p > 0.05$). A Mehran score ≥ 10 performed prior to procedure achieved an AUC of 0.65, $p = 0.006$.



Abstract 58 Figure 1 Median plasma NGAL (ng/ml) and serum L-FABP (ng/ml) in AKI and non AKI

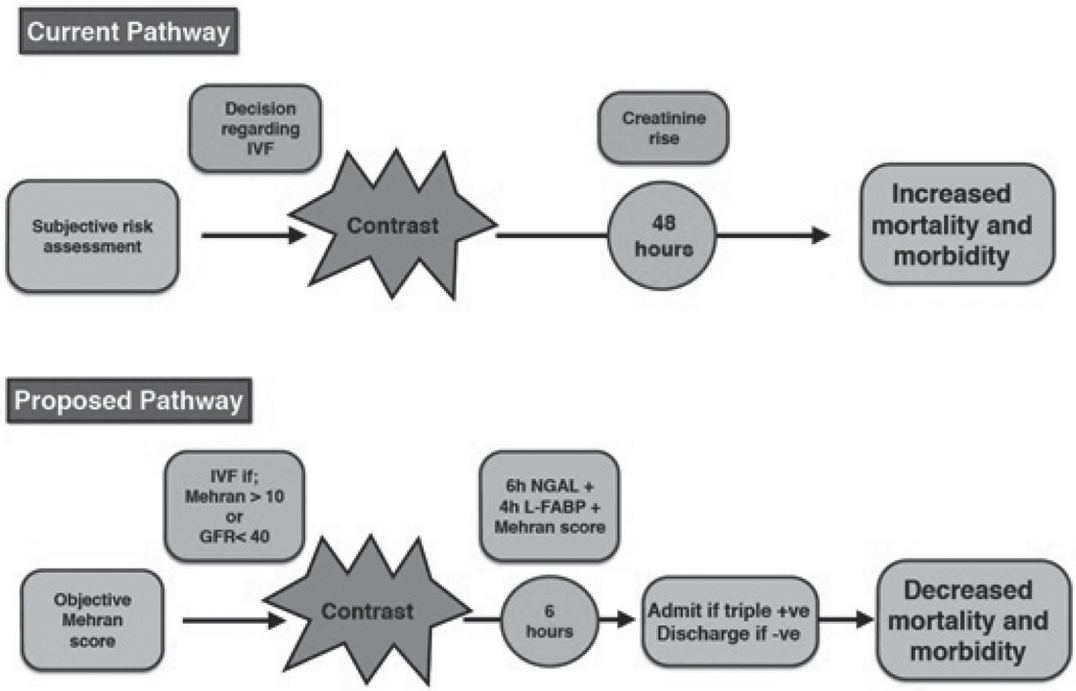
MACE occurred in 7 (25.0%) CIN patients but only 17 (6.2%) non-CIN patients ($p < 0.001$). CIN cases also had considerably higher mortality (10.7% compared to 3.3%, $p = 0.037$). Exploratory analysis showed that the combination of Mehran score >10, 6 hr NGAL and 4 hr L-FABP improved specificity to 96.7%. Figure 2 highlights how biomarkers could be used to identify CIN early and facilitate timely therapeutic intervention to reduce morbidity and mortality.

Conclusions/implications Mehran risk score, 6 hour plasma NGAL and 4 hour serum L-FABP performed best at early CIN prediction. CIN patients were four times more likely to develop MACE and had a trebling of mortality risk at 1 year. The implications of our results, translated to the design of safer elective coronary intervention services able to more efficiently manage the increasing volume of contrast studies, should be a key health priority for providers of cardiac and renal services.

Abstract 58 Table 1 Summary of NGAL (ng/ml) and L-FABP (ng/ml) in AKI and non-AKI patients

Biomarker	Time (hr)	Median CIN	Median non-CIN	AUC	P value
NGAL	0	1108	959	0.62	0.046
	2	1219	883	0.68	0.004
	4	1224	902	0.65	0.014
	6	1337	931	0.71	0.002
L-FABP	0	11.3	7.3	0.65	0.011
	2	11.3	6.9	0.67	0.007
	4	10.7	6.2	0.69	0.001
	6	8.3	6.7	0.63	0.045

Sensit: sensitivity; specif: specificity, PPV; positive predictive value, NPV: negative predictive value, RR: relative risk, OR: odds ratio



Abstract 58 Figure 2 Proposed patient pathways

59 DIASTOLIC BLOOD PRESSURE, SUBCLINICAL MYOCARDIAL DAMAGE, AND CARDIAC EVENTS: IMPLICATIONS FOR BLOOD PRESSURE CONTROL

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10.1136/heartjnl-2016-310523.59

Background The optimal systolic blood pressure (SBP) treatment goal is in question, with SPRINT (Systolic Blood Pressure Intervention Trial) suggesting benefit for 120 mm Hg. However, achieving an SBP this low may reduce diastolic blood pressure (DBP) to levels that could compromise myocardial perfusion.
Objectives This study sought to examine the association of DBP with prevalent and progressive myocardial damage (using high-sensitivity cardiac Troponin-T, hs-cTnT). We also examined prospective associations between DBP and coronary heart disease (CHD), stroke, or death over 21 years; overall and stratified by subgroups of interest.
Methods We studied 11,565 adults from the Atherosclerosis Risk in Communities (ARIC) study. We evaluated cross-sectional DBP and hs-cTnT (dichotomized at 14 ng/L) associations with logistic regression, longitudinal associations between DBP and hs-cTnT change using generalised linear models adjusted for attrition, and prospective associations between DBP and events with Cox regression.
Results Mean baseline age was 57 years, 57% of patients were female, and 25% were black. Compared with persons who had DBP between 80 to 89 mm Hg at baseline (ARIC visit 2), the adjusted odds ratio of having hs-cTnT ≥14 ng/l at that visit was 2.2 [95% CI: 1.2–4.1] and 1.5 [1.0–2.3] in those with DBP <60 mm Hg and 60 to 69 mm Hg, respectively. Low DBP at baseline was also independently associated with progressive myocardial damage on the basis of estimated annual change in hs-cTnT over the 6 years between ARIC visits 2 and 4. In addition, compared with a DBP of 80 to 89 mm Hg, a DBP <60mm Hg was associated with incident CHD (HR 1.5 [1.2–1.9]) and mortality (HR 1.3 [1.1–1.6]), but not with stroke. The DBP and incident CHD association was strongest with baseline hs-cTnT ≥14 ng/l (p value for interaction <0.001). Associations of low DBP with prevalent hs-cTnT and incident CHD were most pronounced among patients with baseline SBP ≥120 mm Hg.
Conclusions Particularly among adults with an SBP ≥120 mm Hg, and thus elevated pulse pressure, low DBP was associated with subclinical myocardial damage and CHD events. When titrating treatment to SBP <140 mm Hg, it may be prudent to ensure that DBP levels do not fall below 70 mm Hg, and particularly not below 60 mm Hg.

60 A COMPARISON OF HFREF VS HFPEF'S CLINICAL WORKLOAD AND COST IN THE FIRST YEAR FOLLOWING HOSPITALISATIONHOSPITALIZATION AND ENROLLMENT IN A DISEASE MANAGEMENT PROGRAM

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10.1136/heartjnl-2016-310523.60

Background Admission with heart failure (HF) is a milestone in the progression of the disease, often resulting in higher intensity medical care and ensuing readmissions. Whilst there is evidence supporting enrolling patients in a heart failure disease

management program (HF-DMP), not all reported HF-DMPs have systematically enrolled patients with HF with preserved ejection fraction (HFpEF) and there is a scarcity of literature differentiating costs based on HF-phenotype.

Methods 1292 consenting, consecutive patients admitted with a primary diagnosis of HF were enrolled in a hospital based HF-DMP and categorised as HFpEF (EF $\geq$ 45%) or HFrEF (EF < 45%). Hospitalizations, primary care, medications, and DMP workload with associated costs were evaluated assessing DMP clinic visits, telephonic contact, medication changes over 1 year using a mixture of casemix and micro-costing techniques.

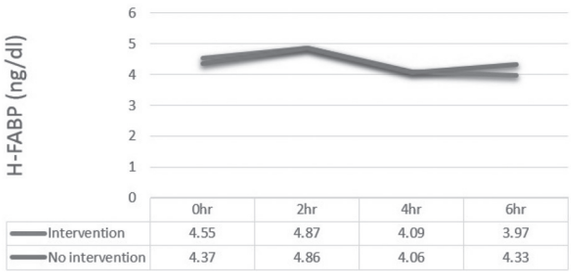
Results The total average annual cost per patient was marginally higher in patients with HFrEF € 13,011 (12011, 14078) than HFpEF, € 12206 (11009, 13518). However, emergency non-cardiovascular admission rates and average cost per patient were higher in the HFpEF vs HFrEF group (0.46 vs 0.31 per patient/12 months). In the first 3 months of the outpatient HF-DMP the HFrEF population cost more on average € 791(764,819) vs € 693(660,728).

Conclusion There are greater short-term (3 month) costs of HFrEF versus HFpEF as part of a HF-DMP following an admission. However, long-term (3–9 month) costs of HFpEF are greater because of higher non-cardiovascular rehospitalisations. As HFpEF becomes the dominant form of HF, more work is required in HF-DMPs to address non-cardiovascular rehospitalisations and to integrate hospital based HF-DMPs into primary healthcare structures.

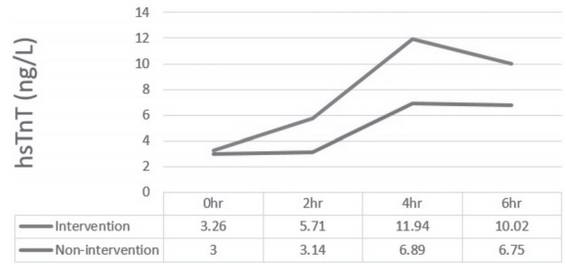
Abstract 61 Table 2 Median 6 hour hsTnT, H-FABP and Tni in intervention and non-intervention groups

Biomarker	Intervention		Non intervention		AUC	p value
	Median	IQR	Median	IQR		
HSTnT(ng/L)	10.0	7.9	6.8	8.2	0.72	0.08
6 hr H-FABP(µg/L)	4.0	0.81	4.31	5.9	0.38	0.34
TnI(µg/L)	19.5	19.7	4.0	25.6	0.71	0.09

hsTnt: highly sensitive troponin T; H-FABP: Heart-type fatty acid-binding protein; TnI: troponin I.



Abstract 61 Figure 1



Abstract 61 Figure 2

Moderated Poster Session 3

61 PREDICTIVE PERFORMANCE OF HEART FATTY ACID-BINDING PROTEIN (H-FABP) AND HIGHLY SENSITIVE TROPONIN T (HSTNT) IN PATIENTS WITH SUSPECTED CORONARY ARTERY DISEASE

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10.1136/heartjnl-2016-310523.61

Introduction Current NICE chest pain guidelines suggest coronary artery calcium scores (CACS), CT coronary angiography (CTCA), functional testing and invasive angiography depending on Diamond Forrester (DF) risk scores. Heart-type fatty acid-binding protein (H-FABP) has previously been assessed as an early ischaemic biomarker. Highly sensitive troponin T (hsTnT) is currently used for ACS diagnosis. Little work has been undertaken to assess early ischaemic biomarkers as predictors of coronary artery disease (CAD) in high risk patients following exercise stress testing (EST).

Abstract 61 Table 1 A comparison of risk factors in the intervention and non intervention groups

	Intervention(%)	Non-intervention(%)	p value
Number	7 (14.6)	41 (85.4)	
Male	4 (57.1)	22 (53.7)	0.55
Smoker	2 (28.6)	9 (22.0)	0.49
Diabetes	0 (0)	4 (10.0)	0.54
Hypercholesterolaemia	5 (71.4)	26 (63.4)	0.46
Hypertension	5 (71.4)	18 (43.9)	0.14
Family History CAD	6 (85.7)	29 (70.7)	0.31

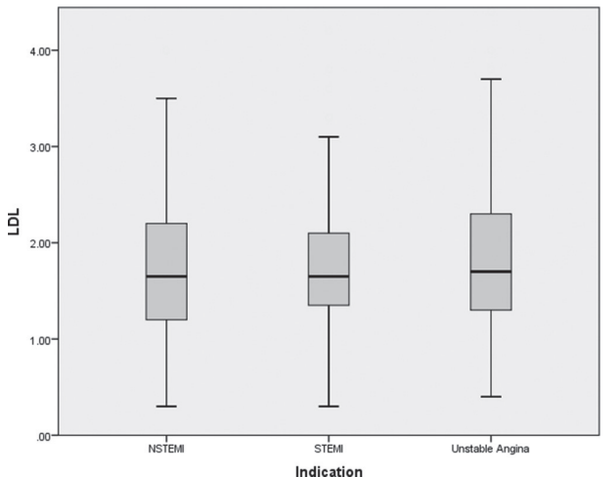
CAD: coronary artery disease

Methodology We prospectively evaluated if H-FABP and hsTnT following exercise could predict a primary outcome of obstructive CAD requiring coronary stenting or bypass surgery in high risk patients recruited from the rapid access chest pain clinic. Baseline demographics, cardiac risk factors and a DF risk score were recorded. Baseline blood samples were taken at 0, 2, 4 and 6 hours for H-FABP and hsTnT after exercising on a full Bruce EST protocol (Figure 2). Invasive angiography was undertaken if this was positive for ischaemia. If the EST was negative, patients had a CACS and if this was >0 patients had follow-on CTCA. Invasive angiography was performed if this showed obstructive CAD.

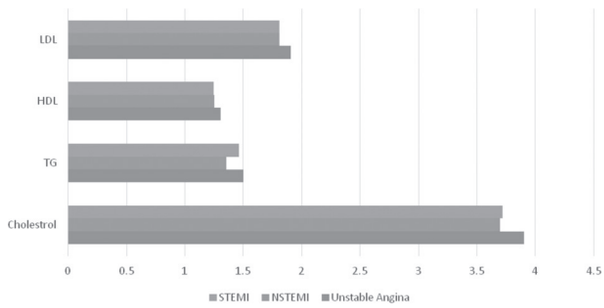
Results Of the 48 patients enrolled, 25 (52.1%) were male, 9 (18.8%) were smokers, 4 (8.3%) were diabetic, 31 (64.6%) had hypercholesterolaemia, 22 (45.8%) had hypertension and 33 (68.8%) had a positive family history of CAD. CAD was seen in

16 (33.3%) patients on CTCA or invasive angiography, 7 (14.6%) met primary outcome criteria (4 had coronary stenting and 3 had bypass surgery). Comparing those with and without intervention, there was no statistical difference in risk factors ($p > 0.05$), Table 1. Median DF score was 92% in the intervention and 92% in the non-intervention group, $p = 0.82$, AUC 0.53. Median CACS score was 55 versus 0 in the intervention versus non-intervention group, $p = 0.27$, AUC 0.72. However, median CACS was predictive of overall CAD, 122 versus 0 respectively, $p \leq 0.001$, AUC 0.89. Table 2 compares median 6 hour hsTnT, H-FABP and TnI in intervention and non-intervention groups. There was no statistically significant difference in any biomarker, $p > 0.05$.

Conclusion In this cohort there was no statistical difference in risk factors or DF risk score between the intervention and non-intervention group. CACS (leading to CTCA) was statistically associated with CAD prediction but not predictive of patients requiring intervention. H-FABP and hsTnT are early ischaemic markers but were not predictive of obstructive CAD post EST in a high risk population.



Abstract 62 Figure 1 Shows mean LDL-C in mmol/L, no significant difference in LDL-C among the 3 groups



Abstract 62 Figure 2 Measn TC, TG, HDL-C and LDL-C across groups

62 LOW DENSITY LIPOPROTEIN CHOLESTEROL (LDL-C), ARE WE ACHIEVING TREATMENT GOALS IN PATIENTS AFTER ACUTE CORONARY SYNDROME? – A REAL WORLD OBSERVATIONAL STUDY

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Introduction Dyslipidaemia is one of the most important risk factors for coronary heart disease (CHD). Lowering of LDL-cholesterol (LDL-C) causes significant reduction in morbidity and mortality, particularly in patients with established CHD post acute coronary syndrome (ACS). The aim of this this study was to assess whether patients presenting to our centre that underwent coronary angiography for ACS are achieving the target level of LDL-C as recommended by European society of cardiology (<1.8 mmol/L).

Methods and results A total of 559 consecutative patient with ACS {109(19.5%) STEMI, 279 (49.9%) NSTEMI, 171 (30.6%) UA} presenting to our regional catheterisation laboratory between June 2013 and December 2014 were identified from our local database. We performed an electronic search for their lipid profile (total cholesterol (TC), triglycerides (TG), LDL-C and HDL-C) performed any time after 6 weeks from presentation up to November 2015.

Mean age was 68.7 ± 12.5 years, 64.9% were males. 73.5% had their lipids profiles performed at a median 149 days (42–740) follow up. Table 1 shows baseline characteristic. Mean LDL was 1.84 ± 0.77 mmol/L with 53% reaching target LDL-C <1.8 mmol/L. Mean HDL-C was 1.26 ± 0.37 mmol/L and TG was 1.44 ± 0.83 mmol/L with 80.7% and 74.7 % reaching desirable level (≥1 mmol/L and <1.7 mmol/L) respectively.

Conclusion In this single centre real-world observational study of acute coronary syndrome patients, mean lipid targets were comparible with recommended guidelines. However, a significant proportion of patients either had no lipid profile performed at follow up or were not achieving treatment goals. Further efforts should be made at a local, national and European level to improve secondary prevention strategies.

63 DAILY ACTIVITY PER MINUTE SLEPT DROPS WITH RENAL IMPAIRMENT IN PATIENTS WITH CHRONIC STABLE HEART FAILURE

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10.1136/heartjnl-2016-310523.63

Background Optimal sleep may replenish energy levels and improve functional capacity. Daily activity levels per minute slept may reflect the efficiency of nocturnal energy storage. It is not known what factors may influence this relationship and whether it affects functional capacity.

Objective We evaluated what factors were related to nocturnal energy storage in patients with chronic stable heart failure.

Methods 105 consecutive patients with chronic Heart failure participated. We evaluated patients activity and sleep levels using Fit-Bit Activity trackers. From this it was possible to calculate the average number of steps taken daily per minute slept at night. We also assessed NYHA and 6 minute walk distances, body composition, diet and cardiac parameters.

Results 76 men and 29 women, avg 67 years were enrolled. Steps per minute slept correlated significantly with age ($r = -0.43^{***}$), eGFR ($r = 0.36^{**}$), BNP ($r = -0.36^{**}$), 6 min walk distance ($r = 0.46^{***}$) NYHA ($r = -0.23^{*}$), protein intake ($r = 0.29^{**}$),

Fat free Mass (r = 0.25*), Total body water (r = 025*), LV ejection fraction (ns) and LV diameter (ns). However estimated GFR (**) was the only significant parameter in a multivariate analysis to correlate with nocturnal energy storage in these patients. N.B {(ns = not significant) $p < 0.05$*, $p < 0.01$**, $p < 0.001$***}

Conclusion Our results highlight that in patients with chronic stable heart failure, renal function may determine nocturnal muscle energy storage and subsequent functional capacity in patients with heart failure.

64 SAFETY AND EFFICACY OUTCOMES OF CRYOBALLOON ABLATION IN PATIENTS WITH PAROXYSMAL AND PERSISTENT ATRIAL FIBRILLATION

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10.1136/heartjnl-2016-310523.64

Introduction Pulmonary vein isolation (PVI) using the method of cryoballoon ablation has been shown to be non-inferior to radiofrequency ablation for treatment of paroxysmal atrial fibrillation (AF) in the recently published 'Fire and Ice' trial. We evaluated the safety and efficacy outcomes of patients undergoing cryoballoon ablation for persistent and paroxysmal AF in a single centre over a four year period.

Methods Retrospective chart review and analysis of procedure notes were performed on patients undergoing cryoballoon ablation between 2012 and early 2016. Recurrence of arrhythmia was based on return of symptoms and documentation of AF on ECG or holter monitor.

Results Sixty four patients were included. AF was persistent in 16 patients. Prior duration of arrhythmia was 5.7–4.6 years. Palpitation was the most common presenting complaint in 40% followed by dyspnoea in 25%. Electrical cardioversion had been performed in 34 patients prior to procedure with 25 undergoing <2 prior cardioversion. Nineteen patients had hypertension and 7 had left ventricular dysfunction. All patients had taken at least one antiarrhythmic agent. Amiodarone was the most commonly prescribed agent in 57%. Waiting time from referral date to procedure date was 10.1–4.2 months. Cryoballoon ablation was undertaken using the Medtronic Arctic Front and Arctic Front Advance catheters. All patients were anticoagulated periprocedurally. Twenty five patients were taking warfarin and the remainder novel oral anticoagulants. Mean procedure time was 107.9 ± 24.2 minutes.

The average number of applications was 7 per procedure, each application for a duration of 180–240 seconds. All pulmonary veins were confirmed to be isolated in 47 patients with 3 out of 4 isolated in 10 patients. Electrical cardioversion was performed in 17 patients to restore sinus rhythm at end of procedure. Right phrenic nerve palsy was noted intraprocedurally in five patients. This was clinically significant on follow up in one patient. Mean follow up duration was 20.4 12.1 months. Thirty patients (46.8%) were free from AF at final follow up. Twenty five patients (39%) experienced recurrence of AF with 7 undergoing repeat PVI using radiofrequency ablation. Nine patients currently await redo procedures. Of those who experienced recurrence, prior pattern of AF was paroxysmal in 15 and persistent in 10. Six patients, including patients from both recurrence and no recurrence groups, developed atrial flutter. Follow up data was unavailable for 9 patients.

Conclusion Provisional results from this real world series suggest lower success rates than seen in large scale trials. This may reflect our heterogeneous cohort including patients with persistent atrial fibrillation and the possible effects that long waiting times may have in terms of increasing burden of arrhythmia and consequent adverse left atrial remodelling.

65 OUT-OF-HOSPITAL CARDIAC ARRESTS IN THE OLDER POPULATION IN IRELAND

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10.1136/heartjnl-2016-310523.65

Background Out of hospital cardiac arrest (OHCA) is associated with a poor survival. Age influences survival but it is unclear to what extent. Patient selection is crucial in deciding who should receive attempted resuscitation to optimise outcomes and minimise inappropriate end-of-life management.

Aim To describe the demographics, characteristics and outcomes following resuscitation attempts in OHCA patients aged 70 years and older in the Republic of Ireland.

Methods Data was extracted from the national Out of Hospital Cardiac Arrest Register (OHCAR) for patients aged 70 years and older. Patient and event characteristics were compared across three age categories (70–79; 80–89; 90 years and older). Logistic regression was used to determine the predictors of the primary outcome in the overall cohort (discharge from hospital alive).

Results A total of 2,443 OHCAs in patients aged 70 years and older were attended by emergency medical services and had resuscitation attempted between 2012 and 2014 in the Republic of Ireland. For the entire cohort, survival to hospital discharge was 3.4%. Asystole was the first rhythm identified in 52.6% of all cases. A shockable initial rhythm persisted as a predictor of survival as age progressed; overall 14.6% of those aged over 70 years survived if the presenting rhythm was shockable, 0.1% of OHCAs survived if asystole was the initial rhythm analysed. Of those suffering an OHCA in a residential institution, 2.2% survived to hospital discharge.

Logistic regression analysis showed that an initial shockable initial rhythm and having a witnessed cardiac arrest were independent predictors associated with increased odds of survival to discharge.

Conclusion Resuscitation is a purposeful exercise in those with advancing age when favourable prognostic markers are present. Data on age related survival can inform those discussing end of life decisions.

66 PREVALENCE OF FABRY DISEASE AMONG PATIENTS DIAGNOSED HYPERTROPHIC CARDIOMYOPATHY AND UNEXPLAINED LEFT VENTRICULAR HYPERTROPHY IN ST. JAMES HOSPITAL (2013–2015)

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10.1136/heartjnl-2016-310523.66

Aim We propose to estimate the prevalence of Fabry disease among diagnosed hypertrophic dilated cardiomyopathy (HCM)

and unexplained left ventricular hypertrophy (LVH) patients attending St. James Hospital between 2013–2015.

Methods Patients invited from cardiology outpatients department (OPD) and implantable cardiac defibrillator (ICD) clinic for screening. Ongoing search for new patients diagnosed with HCM and LVH via echo report, cardiac MRI, device implantation list and from OPD list. A database created. When patients arrived, they are informed regarding Fabry disease, manifestation and implications of having this test and consented for blood testing. Fabry disease symptoms and signs survey form were also completed along family pedigree. Blood samples obtained and bar coded for traceability in the local laboratory and sent via courier to Royal Free Hospital within 72 hours. If the results were positive they were called to clinic for further discussion regarding the implications and will be referred to a metabolic consultant in Mater Misericordiae University Hospital and for nephrology consultant for renal assessment in St. James Hospital. If the blood test were negative they were informed over the phone and letter sent to patient, their general practice (GP) and a copy inserted into their chart. Results were entered into excel spreadsheet and SPSS programmer for analysis.

Results 126 patients with diagnosis of HCM and LVH patients invited to have blood test for Fabry disease. Only 70 (60%) accepted the offer and had the blood test performed. Male patients (63%) had enzyme levels analysis; meanwhile female patients (37%) had enzyme level and DNA analysis specific for Fabry disease. Of the 70 patients, mean age was 52 ± 16 years old, 90% had diagnosis of HCM and 10% had unexplained LVH. Four percent (1 male and 2 female) patients of screened patient has been diagnosed Fabry disease. The prevalence of our cohort study was 4%. One of the diagnosed male patient who has renal impairment had been commenced on Fabraenzyme therapy. One female patient who has renal impairment refused the treatment and the third patient who has eGFR 67 ml/l undergoing assessment from nephrologist and a metabolic consultant specialist. Interestingly we also noted that there were five (three female and further two male) patients noted to have intronic mutations. One of the five patient who had HCM with obstructive features, had lower range of enzyme level. He had patchy late gadolinium enhancement and estimated eGFR 70 ml/min, lower than expected for his age. DNA analysis done which showed two intronic mutations noted and he was diagnosed as late onset Fabry disease and the prevalence in our population rises up to 6%. He was referred for suitability assessment for enzyme replacement therapy.

Conclusion Fabry disease is still a rare genetic disorder, the prevalence in our population is about 6%. Intronic mutations are less understood. This raises question whether everyone should have full DNA analysis regardless of the gender. It is treatable disease with enzyme therapy to herald major late complications. It should be routinely used to screen patients presenting with HCM and unexplained LVH.