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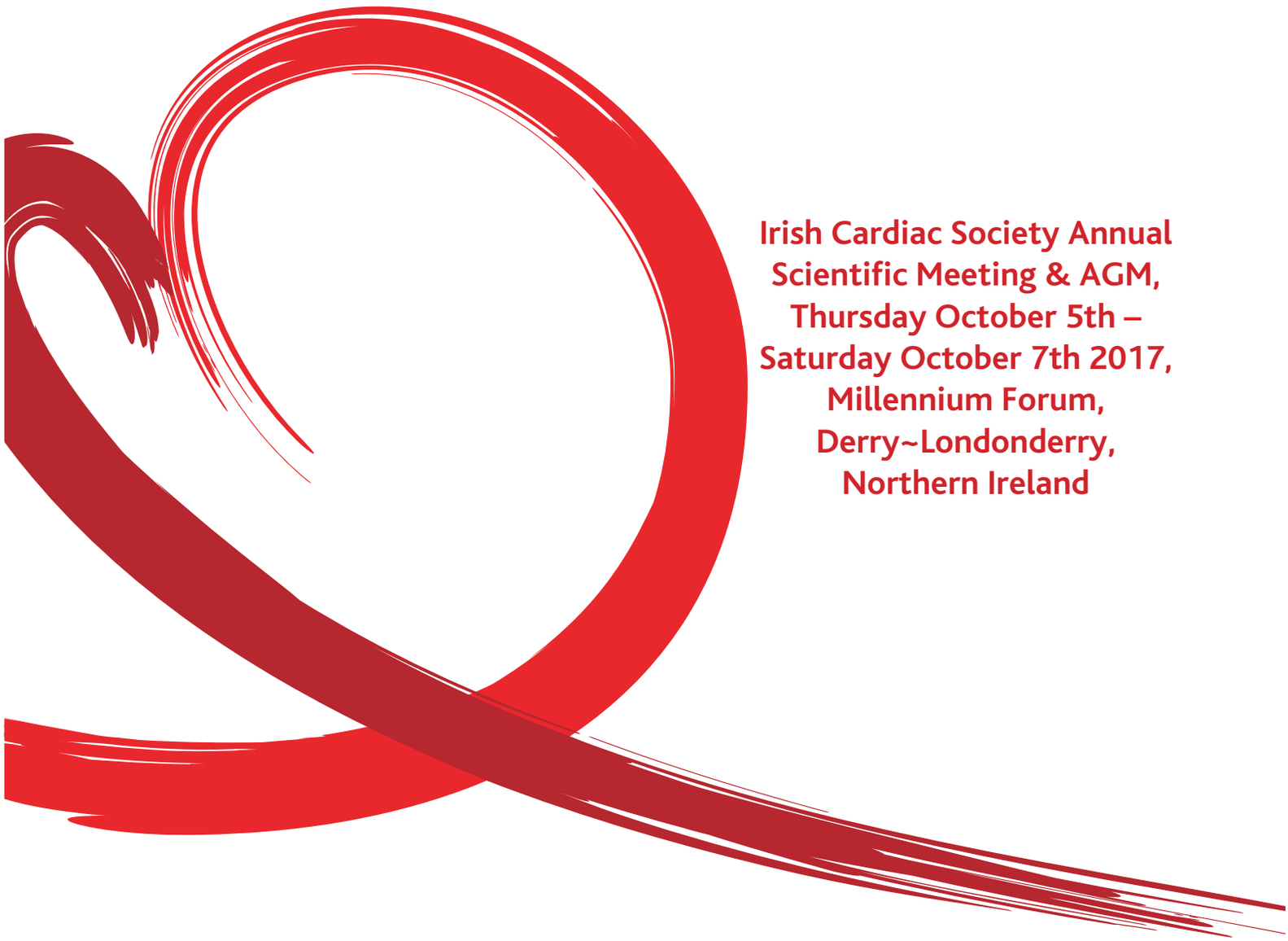

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Oral abstract presentations 1

1 THE POTENTIALLY INAPPROPRIATE MEDICINES IN HEART FAILURE TOOL: APPLICATION IN AN IRISH LONG-TERM CARE SETTING

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10.1136/heartjnl-2017-ICS17.1

Introduction A number of medicines have been identified as contraindicated or cautioned for use in heart failure (HF) patients as their use may lead to worsening HF or poorer prognosis. Heart failure prevalence among elderly residents of long-term care facilities may be as high as 45%. However, there are few data describing the prescription of potentially inappropriate medicines (PIMs) to HF patients residing in this setting. This study will assess the prescription of PIMs in elderly HF patients in long-term care using a disease-specific tool and identify patient factors associated with the prescription of PIMs in these patients.

Methods This is an observational study of residents aged >65 years in 14 long-term care facilities in Cork, Ireland. HF was documented on the patient medical chart or identified by prescription of a loop diuretic. The Potentially Inappropriate Medicines in Heart Failure (PIMHF) tool was used to identify PIMs. This is a HF-specific tool that includes 11 medicines or medicine classes. Comparisons between patients were conducted using independent sample t-tests for continuous variables and chi-squared tests for categorical variables. Univariable and multivariable logistic regression was used to determine the associates of PIMHF use. The model was adjusted for age and sex and the adjusted odds ratio (OR) and 95% confidence interval (CI) were determined.

Results The total number of residents was 732, of whom 265 (36.2%) had HF. Average age of HF patients was 84.8 ±7.4 years and 30% were male. A PIMHF item was prescribed to 74 (28.0%) HF patients. Of these, 19 (7.2%) were prescribed ≥2 PIMHF items. The most commonly prescribed PIMHF items were non-steroidal anti-inflammatory drugs (n=26); oral corticosteroids (n=21); high sodium containing formulations (n=19) and pregabalin (n=14). Residents with HF who were prescribed a PIMHF were younger than those with no PIMHF (83.6 ±7.3 vs. 85.2 ±7.4 years, p<0.001), were prescribed more medicines (13.6 ±3.3 vs.12.1 ±3.8, p<0.001), had a greater number of comorbidities (11.7±3.8 vs. 10.9 ±4.3, p<0.001) and were more likely to have diabetes (27.3% vs. 9.4%, p<0.001) than those who were not prescribed a PIMHF item. Residents prescribed a PIMHF item had a lower rate of loop diuretic prescription (81.0% vs. 90.1%, p=0.047) than those with no PIMHF item prescribed. In the adjusted multivariate logistic regression model, the patient characteristics significantly associated with prescription of one or more PIMHF items were: higher number of medicines (OR=1.09, 95%CI 1.01-1.18) and diabetes (OR=3.30, 95%CI 1.59-6.80).

Conclusions In this Irish long-term care setting, more than one-in-four residents with HF was prescribed a medicine that is considered inappropriate in HF. The PIMHF tool may be of use for those prescribing or reviewing medicines in long-term care residents with HF.

2 HEART FAILURE VIRTUAL CONSULT: TECHNOLOGY TO IMPROVE HEART FAILURE CARE IN THE COMMUNITY

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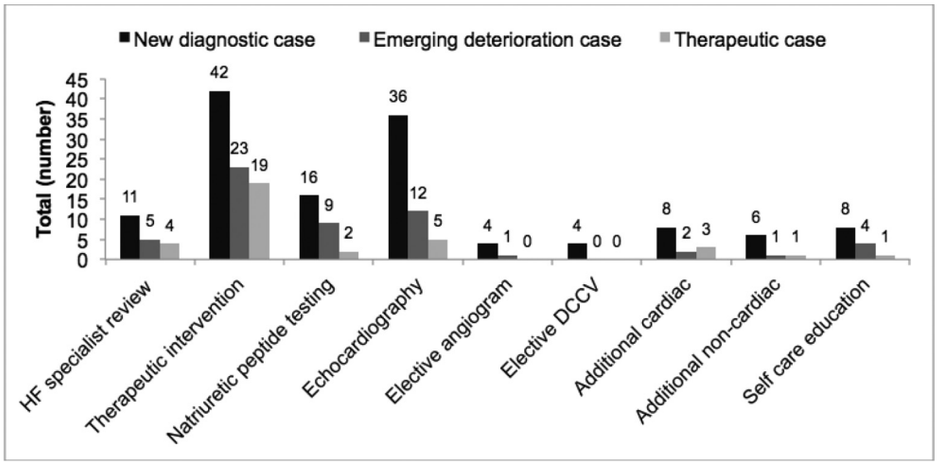
10.1136/heartjnl-2017-ICS17.2

Background The St Vincent's University Hospital Heart Failure Unit in Dublin, Ireland had been providing heart failure virtual consult (HFVC) service for primary care physicians (PCPs) since May 2014. The HFVC service utilises teleconferencing technology to mentor and educate the PCPs on management of heart failure (HF) patients. The purpose of this analysis is to report on the single centre experience and outcome of HFVC.

Methods Consecutive 132 HF consultations from May 2014 till November 2016 were included. The consultations were categorised as new diagnostic, emerging deterioration, or therapeutic cases. The demography, medical diagnoses, and medications were recorded. The outcome were measured as general intervention outcome, final diagnoses in the new diagnostic cases and metric of patient convenience.



Abstract 2 Figure 1 General intervention outcome

Results In 31 months, there were 73 new diagnostic (49.3% male; median age 78 [72 : 82] years), 35 emerging deterioration (60% male; median age 81.5 [76 : 86] years) and 24 therapeutic (54.2% male; median age 82 [71 : 86] years) cases. The full demography, medical diagnoses, medications and metric of patient convenience were described in detailed in Table 1 and 2. The general intervention outcomes of the HFVC were described in Figure 1. In new diagnostic cases, 25 (34.2%) were confirmed HF, 27 (37.0%) were confirmed not HF, and 21 (28.8%) were still indeterminate HF.

Conclusions HFVC service is a feasible model in providing specialist care for HF patients in the community. HFVC could save time and travel distance for HF patients by receiving treatment by their PCPs. The HFVC service help to diagnose possible HF early and guide PCPs to enrol guideline-based therapy early.

Abstract 2 Table 1 Demography and diagnoses

	New diagnostic case	Emerging deterioration case	Therapeutic case
	n=73	n=35	n=24
Gender (n,%)			
Male	36 (49.3%)	21 (60.0%)	13 (54.2%)
Female	37 (50.7%)	14 (40.0%)	11 (45.8%)
Age, years (med [IQR])	78 [72 : 82]	81.5 [76 : 86]	82 [71 : 86]
Co-morbidity (n, %)			
Hypertension	34 (46.6%)	15 (42.9%)	8 (33.3%)
Atrial fibrillation	25 (34.2%)	12 (34.3%)	8 (33.3%)
Chronic obstructive pulmonary disease	8 (11.0%)	5 (14.3%)	4 (16.7%)
Renal impairment	10 (13.7%)	10 (28.6%)	9 (37.5%)
Anaemia	0 (0.0%)	7 (20.0%)	3 (12.5%)
Lipid disorder	11 (15.1%)	5 (14.3%)	3 (12.5%)
Depression	4 (5.5%)	2 (5.7%)	4 (16.7%)
Ischaemic heart disease	12 (16.4%)	15 (42.9%)	11 (45.8%)
Valve disorder	4 (5.5%)	2 (5.7%)	1 (4.2%)
Diabetes mellitus	18 (24.7%)	8 (22.9%)	4 (16.7%)
Medication (n, %)			
ACE-I/ARB	39 (53.4%)	19 (54.3%)	13 (54.2%)
B-Blocker	34 (46.6%)	23 (65.7%)	14 (58.3%)
MRA/AA	0 (0.0%)	4 (11.4%)	1 (4.2%)
Oral anticoagulant	14 (19.2%)	9 (25.7%)	7 (28.0%)
Diuretic	43 (58.9%)	25 (71.4%)	18 (75.0%)
Ivabradine	1 (1.4%)	0 (0.0%)	0 (0.0%)
Digoxin	7 (9.6%)	5 (14.3%)	3 (12.5%)
Statin	34 (46.6%)	18 (51.4%)	13 (54.2%)
Nitrate	1 (1.4%)	7 (20.0%)	3 (12.5%)

Abstract 2 Table 2 Patient convenience

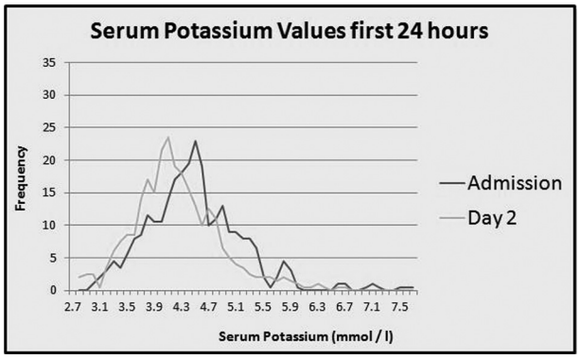
	New diagnostic case	Emerging deterioration case	Therapeutic case
	n=73	n=35	n=24
Outpatient review (n, %)	0 (0%)	0 (0%)	0 (0%)
Emergency department referral (n, %)	0 (0%)	0 (0%)	0 (0%)
Need follow-up virtual consultation (n, %)	29 (39.7%)	5 (14.3%)	3 (12.5%)
Distance travel saved, kilometer			
Total	4881	1383	1298
Median [IQR]	88.5 [19.2 : 88.5]	12.1 [9.93 : 51.8]	88.5 [10.1 : 89.2]
Time travel saved, minute			
Total	4582	1378	1350
Median [IQR]	88 [37 : 92]	22 [17 : 49.5]	88 [23 : 92]

3 IS HYPOKALAEMIA DURING ACUTE EXACERBATIONS OF HEART FAILURE PREDICTABLE OR PREVENTABLE?

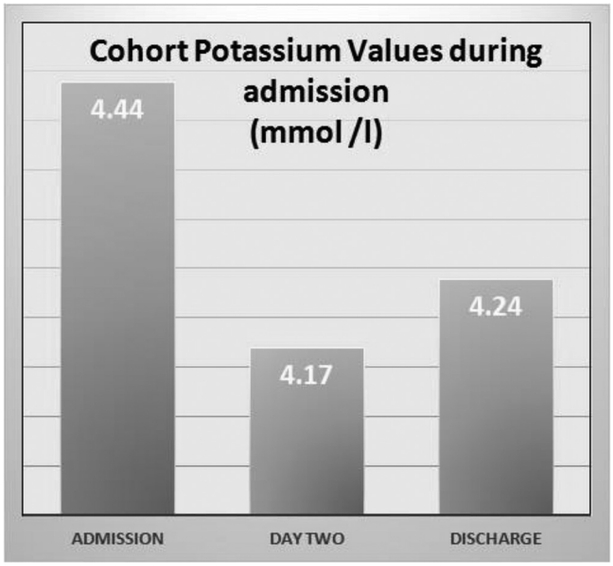
D O'Hare, C O'Connor, Z Coyne, G Balan, C Mac Sweeney, K Tuite, R Murphy, C Daly. *St. James's Hospital, Dublin, Ireland*

10.1136/heartjnl-2017-ICS17.3

Introduction Heart failure activates the renin-angiotensin aldosterone system, which leads to hypokalaemia. This is aggravated by upregulated sympathetic drive and the use of increased amounts non-potassium sparing diuretics during acute exacerbations. Mild hypokalaemia has been shown to increase cardiovascular events in a treated heart failure population. In patients with NYHA class I to III patients, elevations of serum potassium have been shown to reduce the incidence of fatal arrhythmias and sudden cardiac death. Serum potassium levels should be maintained above 4 mmol/l in heart failure patients. The aim of this study was to assess the prevalence of hypokalaemia in a cohort of patients admitted with decompensated heart failure.



Abstract 3 Figure 1 Serum potassium values first 24 hours



Abstract 3 Figure 2 Cohort potassium values during admission

Methods We performed a retrospective review of all patients admitted to St. James's Hospital during a one year period from 1st January 2015 to 31st December 2015, with a principal diagnosis of congestive cardiac failure. A total of 330 patients were included. Blood results on admission, 24 hours and the final result prior to discharge were included for analysis.

Results On admission, 67 (22%) of the 309 patients with admission bloods had a serum potassium value of less than 4.0 mmol/l. Of the sub-group of patients that had bloods taken at both admission and 24 hours, (n=287) the percentage of patients with a serum potassium less than 4.0 mmol/l at 24 hours significantly increased from 21% to 36% ($p < 0.001$).

The average serum potassium of all patients fell significantly during the first 24 hours from 4.44 mmol/L to 4.17 mmol/l ($p < 0.0001$). This resulted in significantly more patients (11% vs 5%) with a potassium value of less than 3.5 mmol/l after 24 hours. ($p<0.001$).

Patients who had a serum potassium of less 3.5 mmol/l after 24 hours had a significantly lower serum magnesium on admission than the patients whose 24 hour potassium result

was within the normal range. (0.71 mmol/L vs 0.81 mmol/L, $p < 0.001$).

Of the patients surviving to discharge, over 33% were discharged with serum potassium values less than 4.0 mmol/l.

Conclusion Our results demonstrate that a significant number of patients with heart failure have lower than desirable serum potassium levels on admission, through their inpatient stay and on discharge (figure 2). Within a cohort of patients hospitalised for exacerbations of heart failure, serum potassium levels fall during the first 24 hours (figure 1). There is a significant correlation between hypomagnesaemia on admission and the prediction of hypokalaemia 24 hours later. Hypokalaemia has been shown to be an independent predictor of mortality in heart failure. This study highlights the importance of close monitoring of serum potassium levels early in the admission, and suggests that identification of hypomagnesaemia can predict hypokalaemia at 24 hours. The authors advise early consideration of aldosterone antagonists or potassium replacement in these patients.

4 COMPARISON OF TRANSTHORACIC AND TRANSOESOPHAGEAL ECHOCARDIOGRAPHY IN THE DIAGNOSIS OF INFECTIVE ENDOCARDITIS – A TERTIARY CENTRE EXPERIENCE

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10.1136/heartjnl-2017-ICS17.4

Introduction Echocardiography is central to the diagnosis and management of infective endocarditis. It is generally accepted that transoesophageal echo (TOE) has a much higher sensitivity for the detection of diagnostic features of endocarditis, however the studies on which these findings are based are outdated and generally included small numbers of patients.[1–3] We hypothesised that improvements in ultrasound technology over the last 15 years may have led to an improvement in the diagnostic accuracy of transthoracic echo (TTE).

Methods We retrospectively reviewed clinical records for all patients with a discharge diagnosis of endocarditis over an 18 month period. Only patients in whom the Duke criteria were fulfilled and for whom echo reports were available for review were included for analysis. Patients treated presumptively for endocarditis with no microbiological, pathological or echocardiographic features of endocarditis were excluded.

Results 112 studies (67 TTE and 45 TOE) were carried out in 52 patients. On a per patient basis, the overall sensitivity of TTE was 69.4% (37/49) and of TOE was 94.7% (36/38) for the detection of features of endocarditis. Sensitivity of TTE was lower again for prosthetic valve or pacemaker endocarditis (56.5% [13/23]) compared to TOE (90% [18/20]) and TTE only detected 33% (3/9) of aortic root abscesses. As several patients had more than one study with both positive and negative findings, results were also analysed on a per study basis. Overall sensitivity of TTE was 65.7% (44/67) and of TOE was 93.3% (42/54). Again, sensitivity of TTE for detection of prosthetic and pacemaker endocarditis was much lower (50% [16/32]) compared to TOE (88.5% [23/26]).

Conclusion Despite advances in imaging technology, TOE remains more sensitive than TTE for the detection of features of endocarditis particularly in cases of prosthetic valve and pacemaker infection. Sensitivity is similar to that of studies performed over 20 years ago. This is likely due to intrinsic differences in techniques. Proximity to structures of interest during TOE allows use of higher frequency ultrasound providing improved spatial resolution and more detailed assessment of structures of interest, particularly the aortic valve and aortic root.

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5 REAL WORLD EXPERIENCE OF A NOVEL ON-SITE CORONARY CT DERIVED FRACTIONAL FLOW RESERVE ALGORITHM FOR THE ASSESSMENT OF INTERMEDIATE STENOSES

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10.1136/heartjnl-2017-ICS17.5

Objective Fractional flow reserve derived from coronary CT angiography (FFR-CT) is a novel tool for assessing the significance of coronary artery stenosis. The primary aim of this prospective study was to evaluate the diagnostic performance of a novel on-site rapid FFR-CT algorithm as compared to invasive FFR as the gold standard in a real world workflow. Our secondary aim was to determine whether the FFR-CT diagnostic performance was affected by inter-observer variations in lumen segmentation.

Methods We enrolled 44 consecutive patients (64.6 ±8.9 years, 34% female) with 60 coronary atherosclerotic lesions who underwent coronary computed tomography angiography (CTA) and were referred for invasive coronary angiography (ICA) in two European centres. ICA with FFR measurements were performed within 60 days after coronary CTA in all lesions. An FFR value of ≤0.8 was considered significant. Coronary CTA scans were evaluated by two expert readers, who determined the effective diameter stenosis (EDS) and manually adjusted the semi-automated coronary lumen segmentations. All extracted vessels were evaluated by an on-site FFR simulator to calculate the FFR-CT values.

Results The mean FFR-CT value was 0.77 ±0.15 and the average coronary CTA based EDS was 43.6±16.9%. On-site lumen segmentation, manual adjustment and FFR-CT simulations were performed in an average of 9 minutes, (range: 3–25 min). The sensitivity, specificity, positive predictive value and negative predictive value of FFR-CT vs. EDS with a cut-off of 50% were the following: 90.5%, 71.8%, 63.3% and 93.3% vs. 52.4%, 87.2%, 68.8% and 77.3%. FFR-CT demonstrated significantly better diagnostic performance as compared

to EDS (AUC: 0.89 vs. 0.74 respectively; p<0.001). The FFR-CT AUCs of the two readers did not show any significant difference (0.89 vs. 0.88; p=0.74).
Conclusion On-site FFR-CT simulation is feasible and has better diagnostic performance than anatomical stenosis assessment. The diagnostic performance of the FFR-CT simulation algorithm does not depend on the readers who adjust the semi-automated lumen segmentation adjustments.

Moderated poster abstracts 1

6 CAN WE DO BETTER IN IMPROVING END OF LIFE CARE AND SYMPTOM CONTROL IN END-STAGE HEART FAILURE?

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10.1136/heartjnl-2017-ICS17.6

Background End of life care (EOLC) preceding end-stage heart failure (ESHF) death is poorly described, even within the context of a HF disease management programme (HF-DMP). It is thought that extending this period of recognition may provide greater opportunity for better care, particularly specialist palliative care (SPC). Therefore, we aimed to characterize EOLC, especially symptom control, during the final year preceding ESHF deaths.
Methods All patient deaths (n=53) within University Hospital Limerick HF-DMP in 2014–2015, were identified and categorized as ESHF and non-ESHF deaths. We retrospectively compared medical record data between both groups for demographics, HF clinic visits, hospitalizations and SPC referral during 12 months preceding death. Missing data was excluded. Data were expressed as mean ± SD or %.
Results All ESHF deaths had at least NYHA III dyspnea prior to last hospitalization/HF clinic visit. None were eligible for heart transplant. No significant differences were observed between ESHF (n=21) vs Non-ESHF (n=20) deaths in terms of age, gender or nursing home admission within last year of life. Left ventricular ejection fraction in all patients was 30 ±13% with approximately a third of patients in both groups with implantable cardiac defibrillators (ICD). Within last 12 months of life, ESHF deaths had more HF clinic visits for HF symptom control with diuretics, versus non-ESHF deaths (1.2 ± 2.0 vs 0.3 ± 0.4, p=0.04). However, there were no significant between-group differences in HF and non-cardiovascular hospitalizations. In both groups, less than a quarter of patients had documented ICD deactivation discussions and less than a third of patients had documented SPC referrals, which were only initiated within the last 3 months of life. During this period, reported symptoms for control in ESHF deaths were dyspnea (86%), pain (19%), fatigue (57%) and oedema (67%), and were not significantly different to comparator group.
Conclusion A low incidence of documented SPC referral for symptom control and ICD deactivation discussions was observed during EOLC of ESHF deaths. This is despite greater HF symptom burden during final 12 months of life within the ESHF deaths group. More work is required to explore these observations, including the use of structured assessment to document such parameters.

7 RISK FACTORS FOR THE DEVELOPMENT OF LEFT VENTRICULAR SYSTOLIC DYSFUNCTION IN PATIENTS RECEIVING TRASTUZUMAB THERAPY – A SINGLE CENTRE RETROSPECTIVE REVIEW

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10.1136/heartjnl-2017-ICS17.7

Introduction Trastuzumab, a humanised monoclonal antibody against HER 2 has revolutionised the management of HER 2 positive breast cancer. Left ventricular systolic dysfunction (LVSD), however, remains one of its use limiting complications. We attempted to identify risk factors for LVSD in our cohort of patients who have received trastuzumab for the treatment of breast cancer in anticipation of starting a cardio-oncology service in our institution.
Methods A retrospective study of patients who received trastuzumab between 2010 and 2015. Baseline characteristics, CV risk factors, pre-chemotherapy CV medications, chemotherapy regimes, and ECHO data were analysed to identify risk factors for the development of LVSD. Continuous variables were compared using a t-test with categorical variables compared using a Fisher test.
Results Between 2010 and 2015, 134 patients completed trastuzumab treatment for breast cancer. Data were available for 109. All were female. The average age at first dose was 52 years (SD 12.8). Ninety nine (91%) were invasive ductal carcinoma with 6 (5.5%) being lobular. Eleven (10%) had metastatic disease, 51 (46.8%) had node positive disease and 47 (43.1%) were node negative. LVSD, defined as LVEF decrease >10%, occurred in twelve patients (11%). Differences between the two groups are outlined in **table 1**. Patients who received both an anthracycline and trastuzumab had a statistically significant increased risk of LVSD (58.34% versus 25.7% p=0.038). No other statistically significant risk factors were identified. The use of beta blockers, ACE inhibitors/ARB's and other cardiovascular drugs did not appear to confer any protective effect in the development of LVSD in our cohort. Numbers receiving these drugs were however small. Two patients had their trastuzumab discontinued and one had a dose reduction due to LVSD. Seven (59%) patients did not have full recovery of their LVEF at last ECHO. None of these patients received disease modifying therapies.
Conclusion LVSD was seen in 11% of our cohort, in keeping with expected rates of trastuzumab related cardiotoxicity. As expected, anthracyclines use identifies a cohort at higher risk of LVSD and interestingly, none of the traditional CV risk factors identified patients who went on to develop LVSD. Additionally, no drugs could be identified as offering any protective effect from LVSD in our single centre cohort. Further work is required to aid identification of patients at increased risk of LVSD.

Abstract 7 Table 1 Comparison between those who developed LVSD with those who maintained normal LVEF throughout treatment

	LVEF reduction >10% during treatment (n=12)	No LVEF reduction during treatment (n=97)	P value
Age	50	52	0.33
Comorbidities			
• Hypertension (%)	2 (16.6%)	20 (20.6%)	1.0
• SBP >140 mmHg at first chemotherapy dose (%)	2 (16.6%)	18 (18.5%)	1.0
• Hyperlipidaemia (%)	1 (8.34%)	17 (17.5%)	0.68
• Ischaemic heart disease (%)	0	3 (3.1%)	1.0
• Atrial fibrillation (%)	2 (16.6%)	3 (3.1%)	0.0925
• Smoking history (%)	6 (50%)	31 (41%)[$]	0.54
• Diabetes mellitus (%)	1 (8.34%)	3 (3.1%)	0.37
Left ventriular systolic function			
• Pre-treatment LVEF	54	56	0.26
Medication use pre cancer therapy			
• Antiplatelet agent (%)	1 (8.34%)	14 (14.4%)	1.0
• ACE/ARB (%)	2 (16.6%)	14 (14.4%)	0.68
• Beta blocker (%)	1 (8.34%)	11 (11.3%)	1.0
• Calcium channel blocker (%)	1 (8.34%)	10 (10.3%)	1.0
• Diuretic (loop or thiazide) (%)	0	9 (9.3%)	0.59
• Lipid lowering agent (%)	1 (8.34%)	15 (15.5%)	1.0
Cancer therapy received			
• Radiotherapy to any area (%)	7 (58.34%)	69 (71%)	0.5
• Radiotherapy to left chest wall (%)	3 (25%)	36 (37.1%)	0.7
• Anthracycline administration (%)	7 (58.34%)	25 (25.7%)	0.038
• Taxane administration (%)	9 (75%)	80 (82.5%)	0.45

$ n=78

8 A RETROSPECTIVE REVIEW OF A CONSECUTIVE COHORT OF PATIENTS TREATED FOR INFECTIVE ENDOCARDITIS: A SINGLE CENTRE STUDY FROM BEAUMONT HOSPITAL

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10.1136/heartjnl-2017-ICS17.8

Introduction Infective endocarditis (IE) is a life threatening infection associated with bacteraemia and the formation of valvular lesions. We aimed to characterise patients with a diagnosis of IE at our centre and assess their clinical features, bacteriology and outcomes.

Methods We retrospectively reviewed patient records of a consecutive cohort of patients who were treated for IE in Beaumont hospital from December 2011 to December 2016. Patients were treated based on clinical suspicion and Duke's scores. We identified patient demographics, predisposing risk factors, organisms (table 1), transoesophageal echo (TOE) features and outcomes.

Results During this 5-year period, 164 patients were treated for IE after TOE. As per Duke's score, there were 102 definite, 56 probable, 1 rejected and 5 had incomplete data. "Probable" IE were mostly culture-negative (53%). Mean age was 62 years, range 19–92 years and 64% were male. Staphylococcal (figure 1) were the most common species identified on blood culture (42%), of which, most were MSSA (27%) and only 7(4%) MRSA. 11% of cases were caused by Streptococcus organisms and 26% of cases were culture negative. A significant number of Staph cases were related to central venous catheters (CVCs) in situ (n=41), haemodialysis lines (n=28) and cardiac implantable electrical devices (CIEDs), n=27(16%). Right-sided disease was predominantly seen with Staph species (57%) with 25.9% of CIED infections subsequently requiring either box change or lead extraction. 10 cases were IVDU-related. There were 26(16%) cases of prosthetic valve endocarditis and these cases were prescribed more antibiotics on average (2.26 vs 1.74) but the mean duration of treatment was similar to native valve disease (6 weeks). A significant proportion of patients suffered embolic phenomena (table 2) (23%) and most of these were cerebral emboli with 4% having abscess formation requiring drainage. Total mortality rate was 14(8.5%) and the majority were Staph positive (64%). 10(6%) mortalities were directly due to IE and 4 (2.4%) due to another cause. Only 6(4%) patients underwent valve repair and 5(3%) underwent valve replacement. 9(5.4%) had 2 presentations of IE with an average of 14 months between presentations. Staph Aureus was most frequently associated with repeat presentations and all such patients had risk factors for IE, with CIED and IVDU being the most frequent.

Conclusions We found a significant number of CIED and CVC related infections which contributed to the burden of IE in this cohort, primarily with MSSA organisms with a substantial requirement for device removal. In addition this organism was associated with more recurrent presentations and embolic events. A small number required cardiac surgery and our overall mortality rate is relatively low compared to international rates; this may be explained by a high index of clinical suspicion and aggressive early antimicrobial treatment.

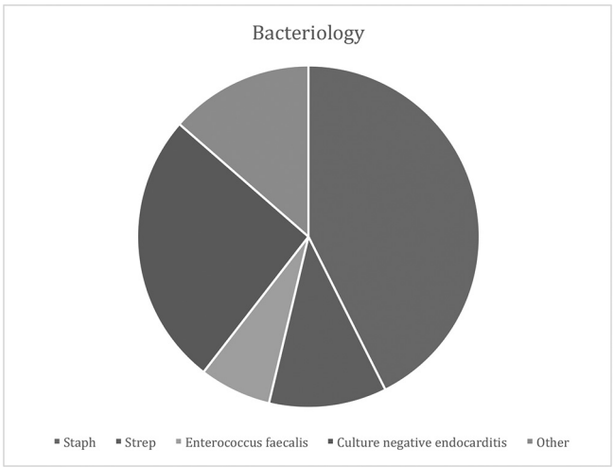
Abstract 8 Table 1 Organisms identified

Microbiology	Number
Staph	**69 (42%)**
Staph Aureus-MSSA	44(27%)
Staph Aureus-MRSA	7(4%)
Coagulase Negative Staph	**18(11%)**
Staph Epidermidis	10(6%)
Coagulase negative staph unspecified	5(3%)
Staph saprophyticus	1(0.5%)
Staph hominis	1(0.5%)
Staph lugdunensis	1(0.5%)
Strep	**18(11%)**
Viridian Group Strep	**12(7%)**
Strep Oralis	2(1%)
Strep Gordonii	1(0.5%)
Strep Sanguinis	2(1%)
Strep parasanguinis	1(0.5%)
Strep Mitis	2(1%)
Strep Anginosus	2(1%)
Strep Gallolyticus	1(0.5%)
Unspecified viridian group strep	1(0.5%)
Group D streptococcus	1(0.5%)
Group B Streptococcus	1(0.5%)

Group A streptococcus	2(1%)
Group G streptococcus	2(1%)
Enterococcus faecalis	**11(7%)**
Culture Negative Endocarditis	**42(26%)**
Other	**22(13.5%)**
Propionibacterium acnes	1(0.5%)
Enterococcus faecium	2(1%)
Capnocytophaga Canimorsus	2(1%)
Corynebacterium Species	1(0.5%)
Candida Parapsilosis	2(1%)
E.Coli	6(4%)
Pseudomonas mendocina	1(0.5%)
Klebsiella Oxytoca	1(0.5%)
Bacteroides Fragilis	1(0.5%)
Serratia marcescens	1(0.5%)
Clostridium Perfringens	1(0.5%)
Ochrobactrum Intermedium	1(0.5%)
Proteus Mirabilis	1(0.5%)
Gram negative bacilli unspecified	1(0.5%)

Abstract 8 Table 2 Embolic events

Major Embolic Events	**38(23%)**
Cerebral Emboli	23(14%)
Cerebral abscess	6(4%)
Bowel infarcts	3(2%)
Digital ischaemia	2(1%)
Pulmonary embolism	4(2%)
Subclinical embolic events	**4(2%)**
Renal infarcts	3(2%)
Splenic infarct	1(1%)



Abstract 8 Figure 1 Bacteriology

9 TAKOTSUBO CARDIOMYOPATHY: A SINGLE CENTRE REVIEW FROM BEAUMONT HOSPITAL EXPERIENCE

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10.1136/heartjnl-2017-ICS17.9

Introduction Takotsubo cardiomyopathy (TC) has now gained recognition as an independent cardiovascular disease process. It typically presents as suspected acute coronary syndrome (ACS) with an emotional stressor as a precipitant. Several diagnostic criteria have been suggested, of which, those published by the Mayo Clinic (2004, revised 2008) are most widely accepted, requiring temporal resolution of left ventricular regional wall motion abnormalities (RWMA) and the absence of obstructive coronary artery disease (CAD), myocarditis and phaeochromoctyoma.

Aim We studied the cohort of patients diagnosed with TC in our centre between 2010–2016. We reviewed the clinical and diagnostic data and reviewed patient outcomes with follow-up.

Methods This is a retrospective analysis of patients discharged from Beaumont Hospital with this diagnosis, as coded by HIPE data, between 01/2010 and 12/2016 by chart and electronic records review. 31 cases were identified but 11 of these patients were excluded as they had been incorrectly coded. These cases included dilated cardiomyopathy (n=3), tachycardia-induced cardiomyopathy (n=2), restrictive cardiomyopathy (n=1), intracranial haemorrhage (n=1). There was one case of myocarditis confirmed on CMR and one case of NSTEMI in a 34 year-old female who had severe LAD related infarction diagnosed on CMR. Of note, one patient, with a confirmed diagnosis, presented with TC on two separate occasions within three years. Data were expressed as mean ± SD and %.

Results The average age of this cohort was 64 ± 12 years, 90% were female and left ventricular ejection fraction at presentation was 34 ± 9%. All 20 patients had elevated Troponin I with peak level 3.13 ± 2.42 ng/ml. Coronary angiography was performed in all cases and showed no or minor CAD (n=18), 2 had moderate CAD. Classical anteroapical hypokinesis in the LAD territory was observed in all 20 patients. Follow-up imaging with either TTE, CMR or both was performed in 85% (n=17), all of which showed temporal resolution of RWMAs. 1 patient awaits scheduled repeat imaging and 2 patients were lost to follow-up. CMR was performed in 60% (n=12) of cases during initial presentation. Average length of stay was 21.2 ± 52 days and there were no inpatient deaths. There was no clinical indication to assess for phaeochromocytoma in our cohort.

Conclusions The number of cases of TC, as derived from HIPE data, seems small and had errors. We are cross-referencing our data with our cath lab database. In our small cohort, most subjects were female and all presented with classical findings. Our results confirm that a multimodality imaging approach, including early coronary angiography, is essential to ensure accurate and early diagnosis. Moreover, we found that early CMR is very helpful in the diagnosis and management of this interesting condition.

10 LEFT ATRIAL ADAPTION IN THE ATHLETIC HEART

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10.1136/heartjnl-2017-ICS17.10

Introduction As part of a screening programme we performed cardiac Echocardiography on an elite hurling team twice during the last four years and as new players emerged. We used conventional echo parameters plus deformation imaging to assess the athletic heart. We know from previous studies that left

ventricular stiffness and compliance is reduced in elite athletes. The aim therefore was to assess the retrograde effect of this on left atrial adaption in competitive athletes compared to controls.
Methods 20 competitive athletes and 20 age and sex-matched sedentary subjects were analysed using conventional Echocardiography and deformation imaging. LA stiffness was determined by measuring peak atrial longitudinal strain (PALS) and peak atrial contraction strain (PACS). Left ventricular (LV) stiffness was also calculated in both groups.
Results LA volume index was greater in athletes as compared with controls (22.6 ± 5.3 vs. 18.6 ± 6.5 mL/m, $p < 0.001$). LA, PALS and LA PACS were lower in athletes in comparison with controls ($p < 0.05$, $p \leq 0.001$, respectively). The Myocardial stiffness index calculated by E/Ea/ LVEDD was lower in athletes then controls. $P< 0.016$).
Conclusions Competitive athletes showed a small increase in LA volume and lower LA stiffness compared with controls. Thus, LA enlargement in the setting of the athlete's heart is not associated with increased LA stiffness. These findings further support the premise that reduced LA stiffness and increased LA volume index is associated with reduced left ventricular myocardial compliance.

General poster session 1

11 ROUTINE PRE-TREATMENT WITH ORAL BETA-BLOCKER FOR OPTIMISATION OF HEART RATES AND TO REDUCE SCAN TIMES PRIOR TO PROSPECTIVELY GATED CT CORONARY ANGIOGRAPHY

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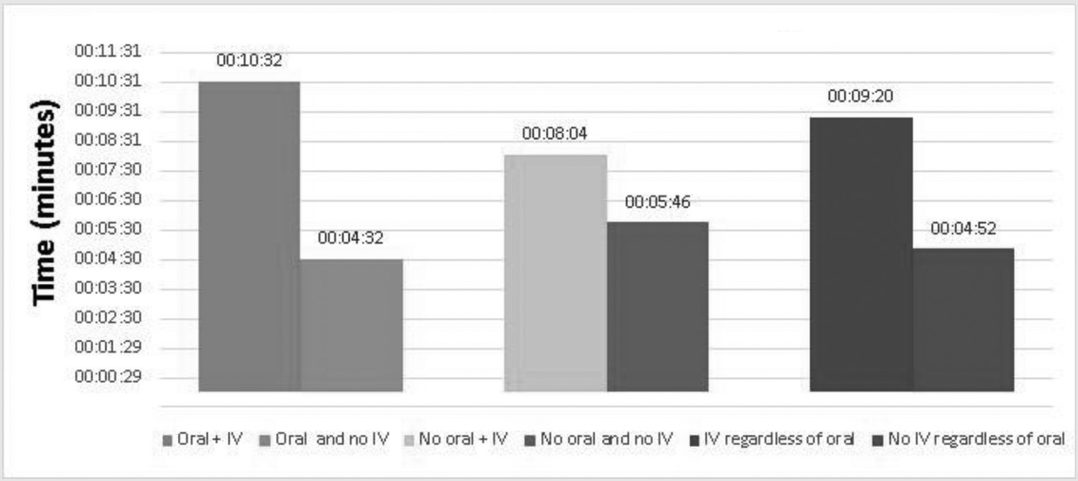
10.1136/heartjnl-2017-ICS17.11

Background Computed Tomography Coronary Angiography (CTCA) is sensitive and specific for ruling out coronary artery disease. Prerequisites in order to achieve optimum image quality include sinus rhythm and heart rate of 60–65 bpm. In the absence of contraindications beta-blockade is first-line treatment to reduce heart rate. Intravenous beta-blocker is frequently used, but this can, however, be time-consuming and may fail to achieve adequate heart rate control. Routine pre-treatment with oral beta-blocker prior to CTCA to reduce heart rate has not been fully evaluated in the literature. This observational study aimed to show that short term protocol guided pre-medication with oral beta-blocker is effective in optimising heart rates and is safe and tolerated by patients.
Methods We retrospectively and prospectively reviewed CTCA cases from a large single centre teaching hospital. Scanning was performed using a helical 80 detector row scanner with prospective gating (Aquilon Prime,Toshiba Medical System). Data collected included beta-blocker use, heart rate, scan time, total dose length product (DLP), adverse events and baseline patient characteristics. The first cohort of patients had CTCA prior to the introduction of a 5 day course of weight based dose Bisoprolol if resting heart rate >60 bpm. The second cohort of patients were followed prospectively after introduction of the protocol. Prior to the protocol routine beta-blocker prescription was at the discretion of the physician.
Results 204 CTCA studies were performed at Tallaght Hospital over an 8 month period. 100 cases took place before the protocol was released. 46 were prescribed oral beta-blocker prior to CTCA and 54 were not. Mean heart rate 64.71.9 bpm. Mean DLP 364.4 ±48 mGy.cm (mean effective dose 5.1 ±0.6 mSv). 104 cases took place after introduction of the protocol. Mean heart rate 57.8±1.2 bpm. Mean DLP 351.6 ±43 mGy.cm (mean effective dose 4.9±0.6 mSv). 67 patients (64%) were prescribed oral beta-blocker. Of these, 50 patients (75%) did not need IV metoprolol. Of the 37 patients not on oral beta-blocker, 21 (57%) did not need IV metoprolol. 14 of these patients did not meet criteria for oral beta-blocker as per protocol and none required IV metoprolol. Mean scanning time was significantly increased when IV metoprolol was used (table 1) ($p=0.00001381$). Mean DLP was 15.5 mGy.cm higher with IV metoprolol use (effective dose 0.22 mSv). 57% of patients had a family history of premature coronary artery disease, 47% dyslipidaemia, 31% hypertension and 24% active smokers. There were no adverse events associated with beta-blocker use and scan quality was similar when heart rate was controlled.
Conclusion Routine pre-treatment with a short course of oral beta-blocker prior to prospective ECG-gated CTCA reduces the requirement for IV beta-blocker peri-procedure, reduces effective radiation dose, significantly reduces scanning time, is safe, well tolerated and maintains diagnostic quality.

Abstract 11 Table 1 Mean CTCA scanning time for cases depending on oral and intravenous beta blocker usage.



12 OBSERVATIONS BY TRANSOESOPHAGEAL ECHOCARDIOGRAPHY POST-WATCHMAN IMPLANTATION IN ATRIAL FIBRILLATION: A CAUSE FOR CONCERN?

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10.1136/heartjnl-2017-ICS17.12

Introduction Data regarding incidence of para-device leaks, persistent inter-atrial septal (IAS) defects and thrombus post-Watchman device implantation for atrial fibrillation is limited. We aimed to observe the incidence of para-device leaks, persistent IAS defects and thrombus detected by transoesophageal echocardiography (TOE), post-Watchman implantation.

Methods We retrospectively identified all patients (n=112) who had a Watchman device implanted between 2014–2016 at 2 Beaumont Hospital and Mater Private Hospital by a single operator. Within this cohort, patients who had undergone post-procedural TOE were analyzed for evidence of para-device leaks, IAS defects (including patent foramen ovale (PFO)) and thrombus. Mean LA pressure was at least 12 mmHg for all patients to ensure volume loading for adequate sizing. Data were expressed as mean ± SD and %.

Results Baseline demographic of all patients were age, 77 ± 7 years; male, 71%; CHADSVASC2 score, 4.3 ± 1.4; with left ventricular ejection fraction 51 ± 8%. All patients had a 14 F catheter across the inter-atrial septum to facilitate Watchman device delivery with mean size 26.8 ± 3.5 mm. Post-procedurally, 84% were on dual antiplatelet therapy and 16% were anti-coagulated for minimum duration of 8.6 ± 4.5 and 8.8 ± 4.3 weeks, respectively. 67% (n=75) had post-procedural TOE performed with duration from time of implant of 5.3 ± 4.2 months. Within this group, there was a 32% (n=24) incidence of para-device leaks post-Watchman implant. Size of leaks measured <2 mm (17%, n=13), 2–5 mm (13%, n=10), 5–10 mm (1%, n=1). Locations of para-device leaks identified were inferior (11%, n=8), superior (15%, n=11), non-specific (7%, n=5). In addition, one patient had device thrombus. Incidence of PFO pre-Watchman was 16%. There was a 17% (n=8) incidence of de novo IAS defects post-Watchman implant after comparison with pre-procedural TOE. Mean IAS defect size pre- and post-Watchman was 0.12 ± 0.38 vs 0.29 ± 0.58 cm, respectively. This change in IAS defect size of 0.13 ± 0.57 trended towards significance (p=0.09).

Conclusions A modest incidence of para-device leaks and rare but significant incidence of para-device thrombus was observed by TOE post-Watchman implantation. Further work is required to correlate potential implications of these findings on longer term outcomes related to recurrent strokes. The significance of persistent IAS defects post device implant also requires further investigation in longitudinal registry follow-up.

13 INCIDENCE AND PREDICTORS OF PULMONARY NODULES AND OTHER SIGNIFICANT EXTRA-CORONARY FINDINGS FOUND ON CT CORONARY ANGIOGRAPHY: A PROSPECTIVE ANALYSIS OF AN UNSELECTED IRISH POPULATION IN A SINGLE CENTRE

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10.1136/heartjnl-2017-ICS17.13

Introduction CT coronary angiography (CTCA) has become the cornerstone in the diagnosis of coronary artery disease (CAD). Cardiologists need to be aware of the prevalence and importance of extra-coronary findings, of which pulmonary nodules are the most commonly encountered.

Aim To determine the incidence and predictors of significant extra-coronary findings on CTCA in an unselected prospectively recruited Irish population.

Methods All patients undergoing CTCA in the Midlands Regional Hospital Mullingar between May 2011 and April 2016 were included in a prospective database. CTCAs were performed using a standard departmental protocol. All patients had calcium scoring performed and, if heart rate and rhythm were suitable, had coronary angiography. All CTCAs were joint reported by experienced consultant radiologists and cardiologists. Pulmonary nodules were categorized according to the Fleischner guidelines. We also recorded all other significant extra-coronary findings reported. Data was analysed using chi-square and Mann-Whitney u tests using SPSS Statistics.

Results A total of 693 patients were included. 181 (26.1%) of these patients were found to have a significant extra-coronary finding on CTCA, of which 79 (11.4%) were pulmonary nodules. Other significant findings included non-nodule pulmonary findings (73), gastrointestinal (17), mediastinal (5), cardiac (4), and breast findings (3). There were no statistically significant predictors of the presence of pulmonary nodules identified in terms of age, sex and multiple cardiac risk factors including smoking history. (Table 1)

Abstract 13 Table 1 Presence of pulmonary nodules identified in terms of age, sex and multiple cardiac risk factors including smoking history

	Nodule	No nodule	p value
Age	55.9 years +/- 9.2	54.8 +/- 9.3	0.35
Sex	54% female	50% female	0.48
Diabetes	5.4%	5.2%	1.0
Hypertension	50%	41%	0.17
Hyperlipidaemia	82.5%	75.4%	0.27
Cardiac family history	84.9%	80.8%	0.52
Smoking history	53.3%	43.3%	0.109

Conclusion Significant pulmonary and non-pulmonary findings are commonly encountered during CTCA. Standard risk factors, including smoking, do not seem to predict the presence of pulmonary nodules. These findings emphasise the importance of a joint reporting system between cardiologists and radiologists in the interpretation of CTCA.

14 THE USE OF SACUBITRIL/VALSARTAN: A REAL WORLD EXPERIENCE IN A HIGH VOLUME SPECIALIST HEART FAILURE SERVICE

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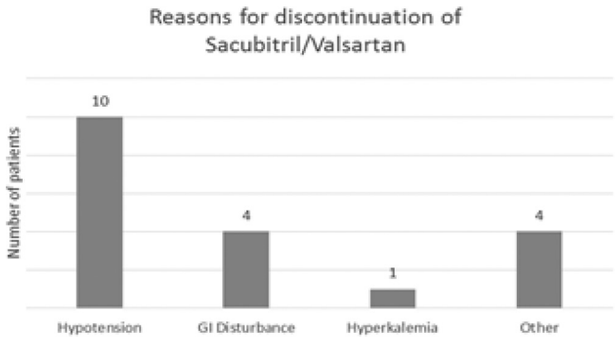
10.1136/heartjnl-2017-ICS17.14

Introduction Sacubitril/Valsartan is a novel therapy in the treatment of heart failure with reduced ejection fraction, demonstrating a lower cardiovascular mortality and heart failure hospitalisation rates compared to standard therapy. We analysed

the additive value of sacubitril/valsartan therapy on a well-managed real world heart failure cohort. Specifically, we aimed to see if there was an appreciable reduction in markers of fibrosis and cardiovascular risk – N-terminal pro-B-type natriuretic peptide (NT pro-BNP) and ST2, a soluble interleukin-2 receptor. We also qualitatively assessed change in diuretic therapy and subjective symptoms of wellness.

Methods All patients commencing sacubitril/valsartan therapy over an 18-month period were included. Of note, patients had been stable on angiotensin axis blockade prior to commencement. Patients were commenced on sacubitril/valsartan at the lowest dose and titrated upwards to either the maximum dose or to maximum tolerated dose based on renal function, blood pressure and symptoms. Serum renal function, NT pro-BNP and ST2 were measured at baseline and after completion of titration of therapy. Differences in baseline and follow-up biomarkers were analysed using a paired student's *t*-test. A *p* value of 0.05 or less indicated a significant change with therapy.

Results 131 patients were included during the observed time period. A total of 19 patients (14.5%) discontinued therapy due to intolerable side effects. Primary reasons for discontinuation of therapy included hypotension (n=10), gastrointestinal disturbances (n=4), hyperkalaemia (n=1) and others (n=4).



Abstract 14 Figure 1 Main reasons for discontinuation of sacubitril/valsartan

Figure 1 demonstrates the main reasons for discontinuation of sacubitril/valsartan as a result of adverse side effects.A total of 19 patients discontinued sacubitril/valsartan. Of patients tolerating therapy, 49 (43.8%) had a reduction in diuretic dose as compared to 3 (2.7%) requiring an increase. 49 patients (43.8%) self-reported a subjective improvement in heart failure symptoms as compared to 4 (3.6%) who reported deterioration in symptoms.

Change in biomarkers in patients completing therapy were assessed by measuring pre and post treatment serum levels. Table 1 below demonstrates the affects sacubitril/valsartan therapy had on the analysed biomarkers.

Abstract 14 Table 1 Average values for each biomarker pre and post treatment with sacubitril/valsartan

	Baseline	Follow-up	*p*-value
NT pro-BNP	1951	1516	<0.0001
ST2	43	38	0.16
eGFR	63	59	<0.0001
Potassium	4.43	4.53	0.32

Conclusion These data demonstrate the efficacy of sacubitril/valsartan in improving symptoms and biomarkers of cardiovascular risk whilst reducing the need for diuretic therapy in a real-world population. Reaassuringly, a strong signal was seen for reduction in NT pro-BNP. Intolerance to the novel therapy was low, although further experience with use of the agent may help avoid discontinuations in the future, especially where physicians may not consider reduction in diuretic dose during therapy to minimise side-effects

15 THE RELATIONSHIP BETWEEN THE BUCKBERG INDEX AND FUNCTIONAL CAPACITY IN STABLE CHRONIC HEART FAILURE PATIENTS

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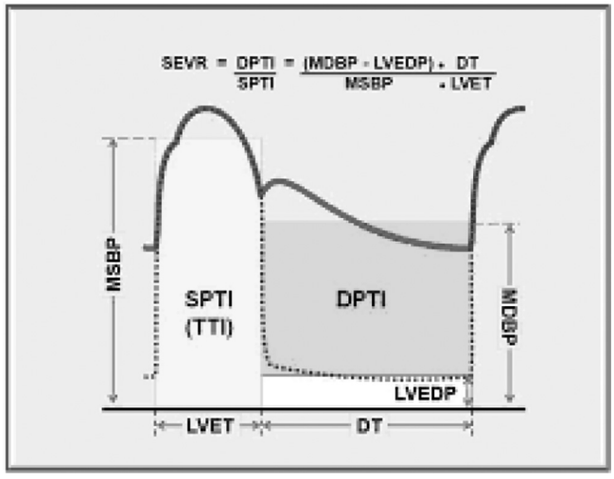
10.1136/heartjnl-2017-ICS17.15

Background The Buckberg index, a diastolic to systolic pressure-time integral ratio, is a resting measure of myocardial oxygen supply and demand. It compares the delivery of oxygen to the heart muscle during diastole to the cardiac workload during systole, calculated through pulse wave analysis. A sub-optimal Buckberg index creates an imbalance which may limit cardiac performance and functional capacity in patients with chronic stable heart failure.

Calculating the Buckberg Index



Buckberg Index (also known as sub endocardial viability ratio or SEVR) is a pressure-time ratio calculation derived from the pressures in the aorta and left ventricle. The diastolic pressure-time integral (DPTI) indicates sub endocardial blood supply while the systolic pressure-time integral (SPTI) indicates myocardial oxygen demand.

Purpose This study was conducted to assess the association between Buckberg index and functional capacity in chronic stable HF patients.

Methods 156 clinically stable HF patients, whose weight, condition and medications had not changed in the previous 3 months participated. Buckberg Index was completed using SphygmoCor system. Systolic-to-diastolic pressure shifts were assessed by the systolic and diastolic pressure-time integrals

and expressed as a percentage. Patients were then categorized as follows;

Buckberg index ≤150% Buckberg index 151–200% Buckberg index ≥201%

Functional capacity was evaluated via 6 Minute Walk testing, NYHA Class, 3 day accelerometer measuring daily step count (FitBit) and Kansas City Cardiomyopathy Questionnaire (KCCQ).

Results Univariate analysis (table 1) demonstrated statistically significant correlations between Buckberg index and 6 MWT distance, NYHA Class and the KCCQ, but not with daily step count (Fitbit). Although the total number of steps did not correlate with Buckberg Index, those with a BI <150% had significantly less steps (4612+/- 3114 steps/day) than those above >150% (6932+/- 4943 steps/day) p<0.01.

Abstract 15 Table 1 Univariate analysis results

Buckberg Index & 6 Minute Walk Test Distance	0.004**	r=0.23
Buckberg Index & NYHA Classification	0.022*	r= – 0.18
Buckberg Index & KCCQ OSS	0.001***	r= 0.26
Buckberg Index & KCCQ CSS	0.001***	r= 0.32
Buckberg Index & Daily Step Count (Fitbit)	0.074	r=0.147

* p<0.05, ** p<0.010, ***p<0.001

ANOVA revealed statistically significant differences among patients grouped (1–3) by Buckberg indexes in relation to 6 MWT ((F (2, 155) = 8.737, p= 0.001)), NYHA Class ((F (2, 156) = 3.407, p= 0.036)), KCCQ Overall summary score ((F (2, 149)=7.516, p= 0.001) and KCCQ Clinical Summary Score ((F (2,146)=11.308, p=0.001)).

Conclusion Buckberg index is associated with functional capacity in chronic stable HF patients. We recommend that HF patients are best managed if the Buckberg Index is >150%. The Buckberg Index is a very useful non invasive marker of sub endocardial viability and is associated with improved functional performance and quality of life (QOL). We observe that a Buckberg Index <150% is associated with both poor function and poor QOL.

16 THE INFERIOR VENA CAVA – NOT JUST A HOMOGENOUS TUBE BUT A COMPLEX STRUCTURE WHICH MAY HOLD USEFUL INFORMATION WHEN INTERPRETED CORRECTLY

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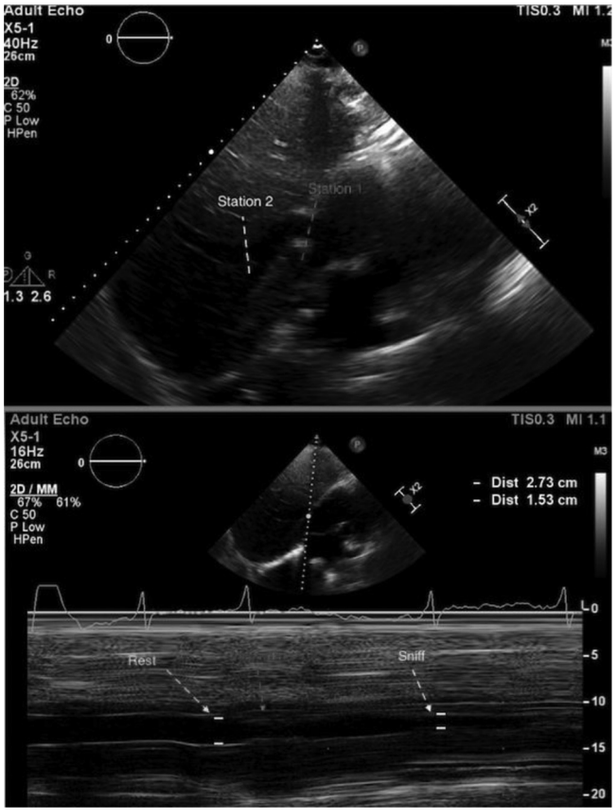
10.1136/heartjnl-2017-ICS17.16

Introduction The inferior vena cava (IVC) is a pliable capacitance vessel for circulating volume. Its current use is as per the American society of echocardiography (ASE) guidelines as an estimate of central venous pressure (CVP) based on maximal diameter (IVCD) and collapsibility index (IVCCI). The use of CVP to estimate volume status is useful in a range of conditions including heart failure and sepsis. Further consideration should be given to where and how these metrics are obtained, either on deep inspiration or sniff as well as location on the IVC where measurements are taken. More detailed, quantitative analysis rather than binary cutoffs may yield more clinically useful information, especially in patients who would be considered borderline volume overloaded by ASE criteria.



Abstract 16 Figure 1

Methods This was a sub study of IVC behaviour in heart failure patients. In addition to the standard measurements of maximal diameter and collapsibility index, we looked to see if there was variation in IVCCI by method of inspiration – deep inspiration vs sniff – as well as looking for variation in IVC behavior by station along the IVC where measurements were taken – between the hepatic vein / IVC junction and right atrium vs 1–2 cm caudad to the hepatic vein. IVC metrics were compared to serum B-type natriuretic peptide (BNP) and N-terminal pro-B-type natriuretic peptide (NT pro-BNP) as crude surrogates for volume status. As this was a small substudy, IVC metrics were detailed using descriptive statistics only.

Results 14 patients were included in total (table 1). 3 subgroups were identified:

1) Patients with IVCCI >40% with both inspiration and sniff with minimal difference (<19%), n=4 2) Patients with IVCCI <40% with both inspiration and sniff with minimal difference (<19%), n=4 3) Patients with difference in IVCCI on inspiration and sniff of >19%, n=6

Abstract 16 Table 1 Results

	Average eGFR (ml/min/1.73 m^2)	Average NT pro-BNP (pg/ml)
Group 1	52	664
Group 2	48	1744
Group 3	35	1476

As expected, the group with IVCCI >40% appeared to have a lower BNP and better renal function than the group with a low IVCCI. However, interestingly, the group with a low IVCCI with deep inspiration and a more normal IVCCI with sniff appeared to behave similarly to the volume overloaded patients with a higher NT pro-BNP.

When comparing position of where IVCCI was calculated along the IVC, patients with similar degrees of collapse at both sites (i.e. difference < +/-9%) had a higher BNP – average of 803 pg/ml, compared to those where there was a more marked discrepancy between IVCCI between the two stations – average of 208 pg/ml, suggesting reduced pliability due to increased circulating volume.

Conclusion Though a small observational substudy, there is potential to suggest that the IVC is not a homogenous, predictable collapsible tube. There may be a role for greater understanding of IVC anatomy and behaviour to more accurately assess volume status which could provide a useful tool for heart failure monitoring in volume-sensitive patients.

17 APPROPRIATENESS OF REFERRALS FOR DOBUTAMINE STRESS ECHOCARDIOGRAPHY IN A DISTRICT GENERAL HOSPITAL

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10.1136/heartjnl-2017-ICS17.17

Introduction NICE guidelines recommend functional testing for chest pain of recent onset where there is an intermediate pre-test probability (30–59%) of ischaemic heart disease using the Diamond Forrester (DF) score [1]. When the pre-test probability is low (10–29%), cardiac CT is recommended, and for patients with a high pre-test probability, invasive coronary angiography is recommended. In practice however, pathways can be influenced by local availability of imaging modalities. This audit aimed to assess appropriateness of referrals and outcome of patients referred for DSE in a district general hospital.

Methodology A retrospective audit of patients undergoing DSE from 1st Nov 2015–1st May 2016 was undertaken. Baseline demographics, risk factors, DF score and DSE outcome (positive or negative for ischaemia) were recorded. For patients with a positive DSE, findings at angiography were assessed. For patients with a negative study, the electronic care record was reviewed to assess incidence of adverse outcomes including acute coronary syndrome (ACS) and mortality. Statistical analysis was performed using Chi square test for parametric categorical variables and Mann Whitney U test for parametric continuous variables, $p<0.05$ taken as significant.

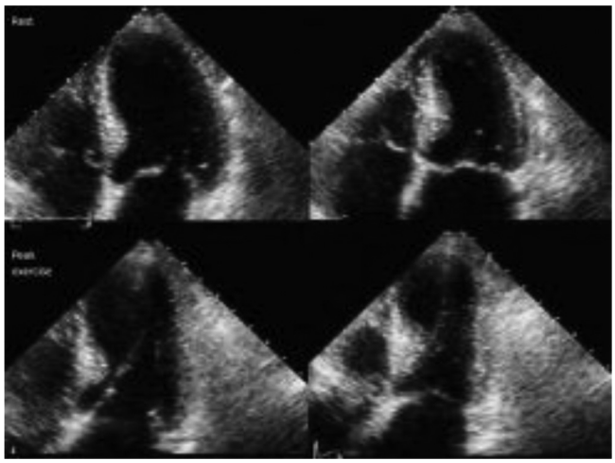
Results In total, 62 patients underwent DSE; 33 (53%) were male. Mean age was 67.5 yrs (SD 10.9 yrs). Mean DF score was 48% (SD 21%). In total 31 (50%) had a DF pre-test probability of 30–59% and were therefore appropriately referred according to NICE guidelines. Ten patients (16.2%) had a positive DSE of which 9 (90%) were male (see table 1). In the DSE positive group the mean DF score was 72%, range 12–89% (SD 23%) compared with a mean DF score of 46%, range 14–92% (SD 18%) in the DSE negative group, $p<0.05$. With the exception of one patient in the DSE positive group (DF 12%), all patients had a DF score of 60–89%, and according to NICE guidance would have proceeded directly to invasive angiography. Of the 10 positive DSEs, 9 had obstructive coronary disease at angiography and 5 proceeded to intervention.

In the DSE negative group, 30 (58%) had a DF score 30–59%, 7 (13.5%) patients had a DF score 60–89%, and 15 (28.8%) had a DF score 10–29%.

Of the 52 (83.4%) patients with negative DSE, there were no admissions for ACS during a follow up period of 6–18 months and no mortality.

Conclusion Patients referred for DSE had a range of DF scores with only 50% patients being appropriately referred according to NICE guidelines. Despite this, DSE correctly identified patients with obstructive coronary disease which required further therapy with a high degree of specificity. Patients with negative studies appear to have a low risk of cardiac events in the short to medium term despite an average DF score of 46%.

Local referral patterns do not adhere to NICE guidance and this may be influenced by access to investigations. DSE appears to identify high and low risk groups even across a range of DF scores.



Abstract 17 Figure 1 Dobutamine stress echocardiography (Normal function top row, akinetic mid to apical septum lower row)

Abstract 17 Table 1 Comparison of demographics of DSE negative and DSE positive patients

Factor	-ve DSE n= 52 (%)	+ve DSE n = 10 (%)	p value
Male	24 (46.2)	9 (90)	0.006
Hypertension	29 (55.7)	5 (50)	0.50
Diabetes	11 (21.2)	2 (20)	0.65
Cholesterol	27 (51.9)	6 (60)	0.30
Smoker	14 (26.9)	1 (10)	0.24

REFERENCE

1. Chest pain of recent onset: Assessment and Diagnosis. NICE Guidelines [CG95] Published Date: March 2010 (updated Nov 2016)

18 AN AUDIT OF CT-CORONARY ANGIOGRAPHY USE AND RESULTS FROM THE CHEST PAIN ASSESSMENT UNIT 2016, CONNOLLY HOSPITAL, BLANCHARDSTOWN

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10.1136/heartjnl-2017-ICS17.18

Background Major developments are ongoing in cardiology for the diagnosis of coronary artery disease, beyond ECG exercise stress test and invasive angiography. Options now include computed tomography coronary angiography (CTCA), cardiac MRI, stress echocardiography, and nuclear scintigraphy. Their proper utilisation has yet to be fully evaluated and depends on local experience, reflected by discrepencies between American and European guidelines.
Aims To evaluate the use of CTCA in Connolly Hospital Blanchardstown from the 1st January-31st December 2016, by reviewing patient profile referred including HEART Score, risk factors and results of investigations, with correlation to CTCA results.
Methods Review referral letters from CPAU requesting CTCA, alongside CTCA result and outpatient letters.
Results There were 196 patients referred for CTCA of 1117 assessed, 101 (51.5%) female, 95 male (48.5%), average age 53.9 years (range 34–75 years). The average HEART score was 2.8, with 2.5 risk factors per patient. From CTCA results, 106 showed normal coronary arteries (54%) and 33 showed minor disease (16.8%), of which 88 (63.3%) were female, 51 male (36.6%), 28 had positive ESTs (20.1%), and 45 had typical angina (32%). The average Heart Score was 2.6. Scattered non-obstructive disease recommending aggressive medical management was reported in 18. There were 35 CTCA reports (17.8%) recommending invasive angiograghy, 27 (77.1%) males and 8 (22.9%) females, with an average Heart Score of 3.2, and 3.19 risk factors. Typical angina was noted in 14, (38.8%) and 8 had positive ESTs (22.2%). One patient was admitted with ACS while awaiting CTCA. There were 3 non-attendances for appointment.
Conclusion There were 17.8% positive reports recommending invasive assessment and 9.18% showing moderate disease, correlating with higher Heart Scores. There were benign findings in 70.9%, the majority being female with lower Heart Scores and less risk factors. All Heart Scores of 0 and 1 had normal results, suggesting stricter referral of patients with Heart Scores $\geq$2 may be considered.

19 ELEVATED HEART RATE IN RECENTLY STABILISED HEART FAILURE PATIENTS AND LONG TERM CARDIAC OUTCOMES

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10.1136/heartjnl-2017-ICS17.19

Background Previous studies have shown that in acute heart failure, elevated heart rate (HR) on acute admission or on discharge is associated with increased short-medium term mortality and morbidity. In chronic heart failure, elevated HR is also associated with adverse outcome. The purpose of this study was (a) to evaluate heart rates in recently stabilised patients at the time of first outpatient review, 1–2 months following heart failure admission and (b) to assess if elevated heart rate at this time point continued to predict adverse outcome over long term follow up.
Methods All patient records presenting to the heart failure service in our Centre between July 2011 and June 2013 were assessed. Inclusion criteria were patients with left ventricular ejection fraction ≤40% on echo, outpatient attendance ≤8 weeks post discharge, in sinus rhythm, and in whom resting HR was recorded. Patients in atrial fibrillation at presentation were excluded. Elevated HR was defined as $\geq$70 beats per minute (bpm). The incidence of readmission for heart failure, acute coronary syndrome (ACS), and death was determined from clinical records with a minimum follow up of three years. Fisher's Exact Test and Student's t-test were used to determine statistical significance.
Results Of 235 patients presenting to the heart failure service between July 2011 and June 2013, 87 (37%) met inclusion criteria. Over half were >70 years of age, 57% were male, and 69% had an ischaemic cardiomyopathy. Mean HR was 69 bpm. Patients were followed for up to 5 years (mean 3.4 years, range 3.2–5 years). Readmission for heart failure occurred in 10 patients, ACS in 7 patients and death in 23 patients. Those with HR$\geq$70 bpm compared to those with HR<70 bpm died at a younger age (mean 70 vs 82 years; p=0.0024), were more likely to die before mean life expectancy of 81 years (92% vs 27% p=0.0028), and had a trend to increased incidence of premature death (defined as death <75 years) (58% vs 18%; p=0.089). There was no significant difference in readmissions for heart failure or ACS between the two heart rate groups.
Conclusions In this study of recently stabilised patients managed by a single heart failure team, in consistent fashion and according to a standardised protocol, those with elevated HR$\geq$70 were less likely to reach mean life expectancy and had a trend to premature death.

20 CHARACTERIZING DURABLE TARGETS FOR THERAPY IN ASYMPTOMATIC LEFT VENTRICULAR DIASTOLIC DYSFUNCTION BY SEQUENTIAL TWO-DIMENSIONAL DOPPLER-ECHOCARDIOGRAPHY AND CARDIAC MAGNETIC RESONANCE IMAGING

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10.1136/heartjnl-2017-ICS17.20

Background Two-dimensional Doppler-echocardiography (2 DE) remains the primary modality in assessing left ventricular diastolic dysfunction (LVDD) due to its widespread availability. In asymptomatic LVDD (ALVDD), the putative precursor of diastolic heart failure, 2 DE imaging of cardiac volume and mass has been reported to be prognostically significant. However, the consistency of such measures is not fully known with limited data on sequential imaging. We aimed to compare reproducibility of cardiac volumes and mass by sequential 2 DE against cardiac magnetic resonance imaging (CMR), the gold standard in evaluating volumes and mass, in patients with ALVDD.
Methods We sub-analysed imaging data from a prospective randomized clinical study (EudraCT 2010-021664-16) evaluating the impact of chronic doxycycline therapy on cardiac remodeling in patients with ALVDD, using 2 DE and CMR. Both modalities were performed by independent blinded observers at baseline, 6 months and 12 months. Cardiac

volumes and mass were indexed to body surface area at each timepoint for all patients. Pearson's correlation was performed between measurements of both modalities at (baseline, 6 months, 12 months) respectively. Results were reported as mean ± SD.

Results All patients (n=48) had mean age 69.8 ± 8.5 years and ejection fraction (EF) 67 ± 7% at baseline. Sequential correlations in EF (0.20, 0.15, 0.34), p = 0.17, 0.32, 0.02 respectively; and left ventricular end-diastolic volume index (LVEDVi) (0.37 , 0.17 , 0.07), p = 0.01, 0.27, 0.65 respectively, were compared between both modalities. Modest but significant correlations were observed between 2 DE and CMR for left atrial volume index (LAVi) (0.39, 0.50, 0.45), left ventricular mass index (LVMi)(0.46, 0.30 , 0.45) and left ventricular end-systolic volume index (LVESVi) (0.43, 0.58 , 0.48); all $p<0.05$.

Conclusion 2 DE-measured EF and LVEDVi demonstrated a predominantly poor correlation with CMR. However, 2 DE demonstrated modest correlation in LAVI, LVMI and LVESVi. The reproducibility of these sequential measurements against CMR supports their use as durable targets for measuring impact of therapies for ALVDD.

21 INITIAL CLINICAL FINDINGS FROM A PROSPECTIVE ROTATIONAL ATHERECTOMY REGISTRY

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10.1136/heartjnl-2017-ICS17.21

Rotational atherectomy (RA) of calcified coronary lesions has been used for almost 3 decades. Through plaque modification, it allows adequate stent expansion, theoretically reducing stent thrombosis and restenosis. UK data demonstrate increasing use of RA over recent years. Since January 2016, we have maintained a prospective registry of all RA cases and followed patients for major adverse cardiac events (MACE). During 2016, 753 PCI's were performed. RA was used in 36 cases (4.8%). Mean age was 75 years (+/- 9 years) and 72% were male. Patients presented electively in 42% of cases, stable acute coronary syndrome (ACS) in 42%, unstable ACS 14% and with ST elevation MI (STEMI) in 2% of cases. Mean Ejection fraction was 48% (+/- 10). Baseline mean Syntax Score was 22.3 (+/- 11.7).In total 34 cases (94%) were performed transradially. A temporary transvenous pacemaker was used in only 4 cases (11%). Primary target vessel for RA was the Left main stem (LMS) in 12 patients (33%), Left anterior descending 8 patients (22%), Circumflex 2 patients (6%) and Right coronary (RCA) in 13 patients (36%). Procedural success was achieved in 35 patients (94%). Maximum burr size was 1.75 mm with 86% of patients requiring only a 1.25 or 1.5 mm burr. In total, 34 patients (94%) had a mean 2.3 (+/- 1.3) drug eluting stents implanted. Mean total stent length was 63 mm (+/-27 mm). There was 1 periprocedural complication (distal wire perforation). During follow up, 4 patients (11%) had a MACE event (2 Non-ST elevation MI, 1 target lesion revascularization, 1 death). Complete revascularization (residual syntax score 0) was achieved in 40% of patients. Follow up MACE events were numerically higher in patients with incomplete revascularization (3 events vs. 1 event P = 0.619). This small series demonstrates the safety and efficacy of RA in contemporary PCI in a high-risk predominantly elderly cohort. Its use in patients presenting acutely including STEMI is more common than its use in the elective setting. The higher numeric MACE rate in patients with incomplete revascularization requires further exploration in a larger, ongoing registry.

22 EVALUATION OF A NURSE LED PRIMARY PCI ACTIVATION SERVICE

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10.1136/heartjnl-2017-ICS17.22

Introduction From the 15th September 2014 every citizen in Northern Ireland has 24/7 access to Cardiac Catheterisation for patients experiencing an acute STEMI or emergent PCI. In one of the 2 designated Primary Percutaneous Coronary Intervention (PPCI) enabled centres, registrar cover is not available, therefore the responsibility to activate the 24/7 PPCI Pathway was given to a senior cardiac nurse known as PPCI activator.

AIM To provide a safe and effective nurse led 24/7 PPCI service.

Method Consecutive calls received by the Activator from January 2015 to December 2015 were evaluated. An interventional cardiologist and senior PPCI activator retrospectively evaluated all case report files and ECGs. Each clinical decision made at the time of call was assessed and the diagnoses /outcomes were recorded. The total calls for the period Jan 2015 – Dec 2015 were recorded and continuous audit performed.

Results A total of 618 calls were received. Of this 416/618 (67%) were turned down. The nurse activators turned down 369/416 (89%)of the calls. The remaining 47/416 (11%) were turned down following discussion with the interventional cardiologist on call. On review all turn downs were deemed appropriate with a wide range of clinical diagnoses. Approximately 15% (58/416) of the referrals sent to the PPCI activator were actually discharged from the ER. Sepsis was diagnosed in 63/416 (15%) of cases. An acute coronary syndrome was ultimately diagnosed in 108/416 (25%) of cases. There were no inappropriate turn-downs by the PPCI activators.

Conclusion Nurse led decision-making in a PPCI pathway is a safe and effective way to manage referrals made for presumed STEMI. Work is required to improve ECG interpretation among those that refer to this pathway.

23 A REVIEW OF THE MANAGEMENT OF NON-CULPRIT PCI FOLLOWING PRIMARY PCI FOR STEMI IN A TERTIARY REFERRAL CENTRE

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10.1136/heartjnl-2017-ICS17.23

Background Robust evidence exists for Primary PCI of culprit lesions in the setting of a STEMI. Management of non-culprit lesions remains less clear, with evidence showing intervention of non-culprit lesions immediately following Primary PCI reduces unplanned revascularisation, but with no reduction in non fatal MI, or mortality, even when FFR guided revascularisation is used.

Aims To review current management of non-culprit lesions in a primary PCI tertiary referral centre in Ireland; to compare

the rate of immediate non-culprit PCI with planned subsequent inpatient/outpatient PCI.

Methods We obtained retrospective data from our hospital's STEMI database of all patients who had a diagnosis of STEMI made between January 1st 2015 and December 31st 2015. We used the hospital's electronic record to obtain details of the initial diagnosis and Primary PCI procedure, as well as any subsequent interventions. We excluded patients who presented following cardiac arrest, or who were treated for cardiogenic shock with inotropes. We excluded patients who had previously undergone CABG. We excluded non-culprit lesions if they involved the left main stem, or if they were chronic total occlusions.

Results 178 patients (36 female (20.2%)) were diagnosed with a STEMI in the study period. 100% of these were taken for Primary PCI, of whom 95.0% underwent successful treatment of the culprit lesion. Of the 169 patients who had successful treatment of the culprit lesion, 116 (68.6%) had more than 1 vessel disease, with 88 (52.1%) having a non-culprit lesion >50%. 25 of these patients had presented following cardiac arrest (12), had cardiogenic shock (5), CTO (1), previous CABG (4), or non culprit LMS (3). Of the remaining 63 STEMI patients who had successful treatment of the culprit lesion, only 3 patients underwent non-culprit PCI during the initial procedure, a further 15 patients underwent staged PCI (10 during the initial admission). Overall, within the 178 patients presenting with STEMI, 19 patients underwent staged PCI following STEMI, with 12 of these occurring during the same inpatient stay. 7 patients were referred for CABG.

Conclusions 4.8% of patients who were potentially eligible for non-culprit PCI following successful primary PCI of culprit lesions underwent further PCI of non-culprit lesions during the initial procedure, with a further 25% of these patients undergoing PCI in a staged manner. This shows a low rate of non-culprit PCI during the initial procedure, despite 10.7% of all STEMI patients undergoing staged PCI after the initial primary PCI.

24 A NON-RANDOMIZED COMPARISON OF TWO PACLITAXEL-COATED BALLOONS FOR THE TREATMENT OF CORONARY IN-STENT RESTENOSIS

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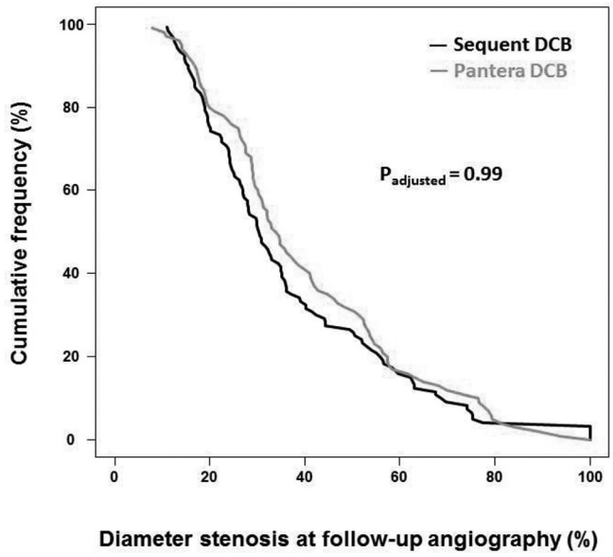
10.1136/heartjnl-2017-ICS17.24

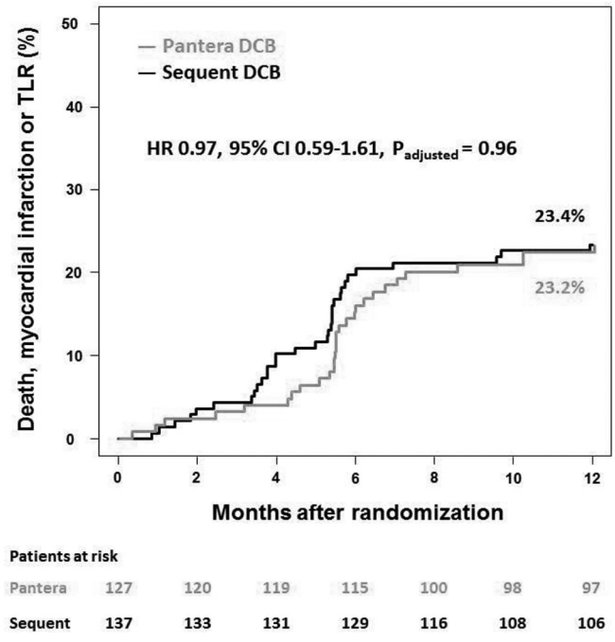
Aims Treatment of coronary in-stent restenosis (ISR) with paclitaxel-coated balloons (PCB) is recommended in European guidelines (class I recommendation, level of evidence A). Although iopromide-based PCB have been studied in numerous randomised trials, there is a relative paucity of data regarding butyryltri-hexyl citrate (BTHC)-based PCB and there has been no prospective head-to-head comparison of these devices. The aim of this study was to compare iopromide- and BTHC-PCB with respect to angiographic and clinical outcomes.

Methods Patients with ISR lesions treated with iopromide- and BTHC-PCB enrolled in 2 consecutive multicentre randomised trials were included. Patients treated with iopromide-PCB were enrolled between August 2009 and October 2011; patients treated with BTHC-PCB were enrolled between June 2012 and December 2014. Inclusion criteria were ischemic symptoms or evidence of myocardial ischemia in the presence of a restenosis >50% located in a native vessel DES. Exclusion criteria included target lesion located in the left main stem or in a coronary bypass graft, acute ST-elevation myocardial infarction within the preceding 48 hours, cardiogenic shock, and severe renal insufficiency. The primary angiographic endpoint was binary angiographic restenosis at 6–8 months. The primary clinical endpoint was the composite of death, myocardial infarction or target-lesion revascularisation at 1 year. Multivariate analysis was performed to adjust for differences in baseline characteristics between treatment groups.

Results 264 patients were treated with iopromide-PCB (n=137) or BTHC-PCB (n=127). Baseline clinical



Abstract 24 Figure 1



Abstract 24 Figure 2

characteristics were similar for both groups, apart from a higher incidence of hypertension and lower incidence of prior myocardial infarction in the iopromide-PCB group compared with the BTHC-PCB group. Treatment groups were well-matched in terms of baseline angiographic and procedural characteristics, apart from smaller vessel size (2.78 vs. 2.89 mm, p=0.02) and lower % diameter stenosis post-procedure (18.4 vs. 22.3%, p=0.001) in the iopromide-PCB group. Surveillance angiography at 6–8 months was completed in 84% of patients. The primary angiographic endpoint occurred in 39 (32.5%) vs. 32 (32.0%) patients in the iopromide-PCB vs. BTHC-PCB groups ($P_{adjusted}$=0.99) (Figure 1). The primary clinical endpoint occurred in 32 (23.4%) and 29 (23.2%) patients in the iopromide-PCB and BTHC-PCB groups, respectively ($P_{adjusted}$=0.96) (Figure 2). Rates of death (3 [2.2%] vs. 2 [1.6%], $P_{adjusted}$=0.89), myocardial infarction (3 [2.2%] vs. 2 [1.6%], $P_{adjusted}$=0.62), TLR (30 [22.0%] vs. 27 [21.7%], $P_{adjusted}$=0.99) and target-lesion thrombosis (1 [0.7%] vs. 0 [0%], $P_{adjusted}$=0.93) were similar in both groups.

Conclusions In patients treated for in-stent restenosis, iopromide-PCB and BTHC-PCB showed comparable angiographic and clinical outcomes at 1 year.

25 STEMI PATIENTS WITH EJECTION FRACTION 35 PERCENT OR LESS; PERCENT IMPROVEMENT, AVERAGE TIME TO IMPROVEMENT AND OUTCOMES 2014–2017, 2017

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10.1136/heartjnl-2017-ICS17.25

Introduction Left ventricular ejection fraction (LVEF) is an independent risk factor for adverse cardiac outcomes post ST elevation myocardial infarction (STEMI). Post-STEMI patients can have lower than expected LVEF due to reasons other than myocardial necrosis owing to physiological aspects such as hibernation and stunning of myocardium. Much interest in the literature focuses on the months post infarction. This project attempts to assess the acute window in the weeks post STEMI where it is hypothesised there can be considerable improvement in LVEF.

Methods This retrospective study assessed follow up data on STEMI patients presenting to University Hospital Limerick (UHL) between January 2014 and January 2017. The study was initially presented to the UHL ethics committee and having being vetted was approved. An existing STEMI heartbeat database and PCI clinic database were used to identify the patient cohort estimated to be ten percent of STEMI cases based on an extensive literature review. Patients who had STEMI and had an inpatient transthoracic echocardiogram (TTE) showing LVEF of 35% or less were selected. Patients were excluded if they did not attend follow up in UHL or they did not have a repeat TTE done between 28 to 48 days post STEMI. Basic demographics, culprit vessel, time to follow up TTE as well as percentage improvement were recorded by accessing the patients electronic cardiology record comprising of TTE and coronary angiography reports via McKeeson Cardiology Software.

Results There were 634 STEMI cases presenting to UHL for primary percutaneous intervention (pPCI) during the study period. A total of 44 patients were identified to have a post-pPCI LVEF of 35% or less. 9 patients were excluded as they did not have repeat TTE within the requisite 48 day follow up period. 2 patients suffered fatal outcomes of death. 4 patients had not attended UHL for repeat TTE with repeat imaging at tertiary hospitals in Ennis and Nenagh respectively. Of the 29 patients with sufficient data, 83% (n=24) were male with the average age of 60.3 ±13.1 years. Culprit vessels were the left anterior descending artery in 83% (n=25) of patients, right coronary artery in 14% (n=4) patients and left circumflex artery in 3% (n=1). Average LVEF at baseline was 29.2% ±4.77%. Average time to repeat measurement was 37.4 ±5.3 days. There was an improvement in 20 patients, with an increase in LVEF of between 2.5% to 17.5%. 7 patients showed no improvement. 2 patients disimproved. This represents 69% of the cohort showing improvement within 48 days with a median increase in LVEF of 5% (interquartile range 15%).

Conclusions This small sample of STEMI patients shows promise for improvement in LVEF within 48 days post STEMI. This shows potential for improved cardiac function in the weeks rather than months post STEMI in line with concepts of stunning and hibernation of myocardium post myocardial infarction. It also provides an estimate on post STEMI low LVEF patients that may be candidates for alternative novel or research therapies.

Oral abstract presentations 2

26 USE OF A ONE HOUR HIGH SENSITIVITY TROPONIN T MEASUREMENT IN THE INITIAL ASSESSMENT OF PATIENTS PRESENTING WITH CARDIAC CHEST PAIN TO EMERGENCY DEPARTMENTS IN THE BELFAST TRUST

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10.1136/heartjnl-2017-ICS17.26

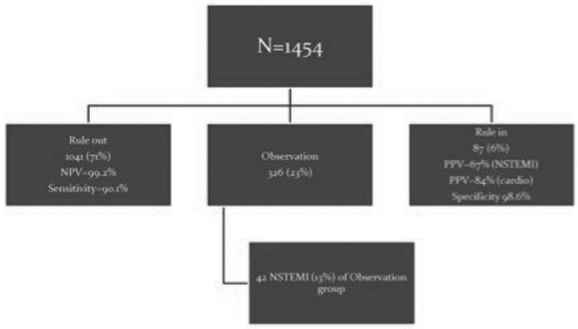
Aims To establish the safety and efficacy of a rapid one hour chest pain pathway using high sensitivity troponin T (HsTnT) to triage patients presenting with cardiac sounding chest pain to Emergency Departments (ED) in the Belfast Health and Social Care Trust (BHSCT).

Methods Recent ESC guidelines support the use of HsTnT and a one hour pathway to safely "rule out" myocardial infarction (MI) in patients presenting to the ED with suspected cardiac chest pain. After an initial pilot study the BHSCT implemented a one hour pathway in July 2016 incorporating results of HsTnT levels at presentation and one hour, patient risk assessment and 12 lead ECG. Based on this the pathway triaged patients to a "rule out MI", "observation" or "rule in MI" group. After introduction follow up data was collected on every patient presenting with chest pain between 1st July 2016 and 30th September 2016 to both ED's within the BHSCT. Follow up data on final diagnosis, MACE, re-presentation to the ED and mortality was collected for a period of six months.

Results Of the 1,454 patients included in the analysis (see figure 1) 594 (41%) were female and the average age was 62. 1,041 (71.6%) patients were triaged to the rule out group and there were no new cardiac diagnoses in this group at 90 days and no cardiac deaths at 6 months. 326 (22.4%) patients were triaged to the "observation" group and there were 4

(1.2%) cardiac deaths in this group at 6 months. Within the observation group a further 42 patients were diagnosed with MI (13% of observation group). 87 (6.0%) patients were triaged to the "rule in" group where 65 (74.7%) had a diagnosis of NSTEMI and 90% had a diagnosis requiring admission under cardiology. There were 6 (6.9%) cardiac deaths in the "rule in" group at 6 months. The negative predictive value for the rule out group was 99.6% and sensitivity 90.1%. The positive predictive value for the rule in group was 84% with a specificity for a cardiac diagnosis of 98.6%.

Conclusion Implementation of a one hour troponin pathway in conjunction with clinical assessment is accurate and safe. Using the pathway meant that 77% of patients could be rapidly ruled 'out' or 'in' using the one hour pathway enabling timely decision making in the ED and safe discharge for 71% patients. In those patients for whom acute MI was ruled out, there were no cardiac deaths after six months follow up.



Abstract 26 Figure 1 Triage of patients presenting to ED with suspected cardiac chest pain using one hour algorithm

27 ANGIOGRAPHIC RESTENOSIS AFTER CORONARY STENTING IN PATIENTS WITH PREVIOUS CORONARY BYPASS SURGERY

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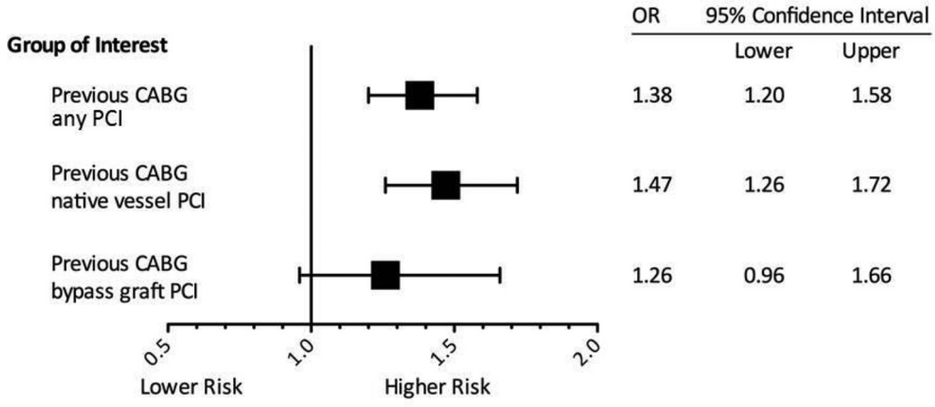
Introduction Restenosis after percutaneous coronary intervention (PCI) with stent implantation in patients with prior CABG is poorly studied. The aim of this study was to investigate the incidence and predictors of angiographic restenosis after PCI in patients with and without prior CABG.

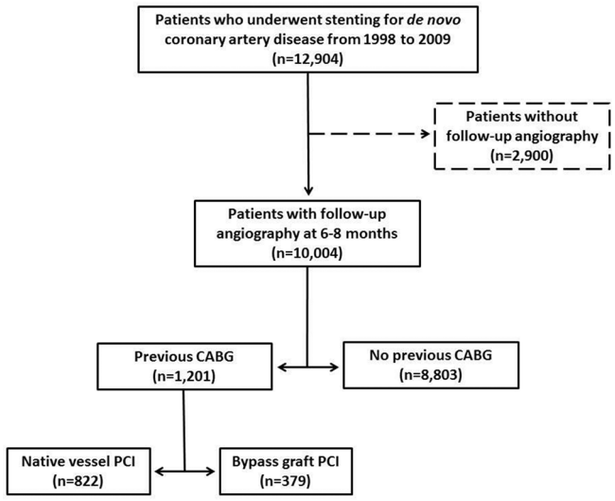
Methods Patients undergoing successful PCI of 1 or more de novo lesions with available surveillance angiography at 6–8 months after intervention were eligible for inclusion. Exclusion criteria were cardiogenic shock, renal replacement therapy and prior cardiac transplantation. Patients with prior CABG were further classified into patients who underwent bypass graft PCI versus native vessel PCI. The primary endpoint was in-segment binary restenosis at 6–8 months angiographic follow-up. Multivariate analyses were performed to adjust for differences in baseline characteristics between groups and to determine predictors of binary restenosis.

Results 10,004 patients with 14,999 lesions were included, 8,803 patients (88%) without prior CABG and 1,201 (12.0%) with prior CABG. Of patients with prior CABG, 379 (31.6%) patients had PCI to a bypass graft and 822 (68.4%) to a native vessel. A study flow diagram is shown in figure 1. Compared with patients without prior CABG, patients with prior CABG were older, had higher rates of diabetes and prior myocardial infarction, lower left ventricular ejection fraction and larger reference vessel diameter (2.95 vs. 2.85 mm, $p<0.001$). At 6–8 month angiographic follow-up, the rate of binary restenosis was significantly higher in patients with prior CABG compared to patients without prior CABG (25.0% vs. 20.0%, Padjusted<0.001). Among patients with prior CABG, patients with bypass graft PCI as compared to patients with native vessel PCI had a lower incidence of diabetes, a higher rate of presentation with ACS, larger target vessel size (3.42 vs. 2.80 mm, $p<0.001$) longer lesion length (16.0 vs. 13.9 mm, $p=0.01$) and significantly higher BMS use (72.1% vs. 37.0%, $p<0.001$). At 6–8 month angiographic follow-up, there was no significant difference in binary restenosis rates among patients with bypass graft PCI compared with those with native vessel PCI (23.8% vs. 25.3%, Padjusted=0.81). In patients with prior CABG, there was an independent association between native vessel PCI and restenosis (OR 1.47, 95% CI 1.26–1.72, $p<0.001$) but not bypass graft PCI and restenosis (OR 1.26, 95% CI 0.96–1.66, $p=0.09$) (Figure 2).

Conclusions Compared with patients without prior CABG, patients with prior CABG had overall higher rates of restenosis. In patients with prior CABG, restenosis rates were similar in patients undergoing bypass graft PCI and native vessel PCI



Abstract 27 Figure 2 Predictors of in stent restenosis according to treatment group



Abstract 27 Figure 1 Study Flow Diagram

and native vessel PCI was independently associated with binary restenosis at 6–8 months.

28 INITIAL EXPERIENCE OF DONEGAL CROSS BORDER PROGRAM BETWEEN LETTERKENNY UNIVERSITY HOSPITAL (ROI) AND ALTNAGELVIN AREA HOSPITAL (NI)

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10.1136/heartjnl-2017-ICS17.28

Introduction County Donegal has traditionally been isolated as a result of its geographical remoteness from 24/7 Primary Percutaneous Intervention (PPCI) enabled centres in the Republic of Ireland. The National Acute Coronary Syndrome (ACS) programme is designed to increase access to PPCI for patients with ST Elevation Myocardial Infarction (STEMI). A cross-border initiative between the SAOLTA Hospitals, HSE, Republic of Ireland and the Western Health and Social Care Trust in Northern Ireland commenced on 5th May 2016 to provide PPCI for Donegal. We sought to evaluate the initial effectiveness of this unique Cross border PPCI pathway.
Methods ECG's from Donegal patients suspected of having a STEMI were transmitted from the National Ambulance Service (NAS) or Letterkenny University Hospital (LUH) ER to Altnagelvin Hospital PPCI service. All data were recorded for continuous audit purposes to assess performance indicators, ECG interpretation and the number of referrals made to the PPCI activator in Altnagelvin. All patients who had an ECG transmitted to Altnagelvin PPCI centre from May 2016 to March 2017 were included.
Results 139 patients were referred with a suspected STEMI to the Cross Border PPCI pathway with 88/139 patients (63%) referred from the National Ambulance Service (NAS); the rest referred from LUH ER. 95/139 (68%) patients were turned down. Only 44/139 patients were accepted for PPCI with a false activation rate of 32%. Only 30/139 patients actually had a final diagnosis of STEMI. The mean time from STEMI diagnosis on ECG to reestablishing flow in the culprit artery was 117.8 minutes within guidelines. No complications occurred during transfer and 89% were repatriated within 24 hrs. All 95 patients that were turned down were deemed appropriate with only 10/95 (10.5%) actually requiring PCI prior to discharge.
Conclusion Initial audit of this unique Cross Border PPCI pathway suggests that it is working effectively. The high referral rate and high rate of turn-downs suggest that diagnostic accuracy of ECG interpretation may need to be evaluated. The high rate of false activations is notable and also requires further investigation. The early success of this unique Cross border service is very encouraging when considering the geographical remoteness of Donegal. Work will continue to further improve this vital service for the people of Donegal.

29 DEVELOPMENT OF MINIMALLY INVASIVE MITRAL REPAIR PROGRAM

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10.1136/heartjnl-2017-ICS17.29

Introduction Setting up a minimally invasive approach to mitral valve repair requires a mentored approach and team work of all personnel involved. Prior to program commencement the surgical team had site visits to an international centre of excellence.
Methods Over the last year, we have subsequently undertaken mitral repair using a thoracoscopic approach in 22 patients. Their ages ranged from 27 to 86 years, (11 male, 11 female) with a mean age 60 years. A specialist surgeon, experienced in minimally invasive mitral surgery was present at all cases.
Results All patients had a successful mitral repair performed. One patient required conversion to full sternotomy. One patient had an abdominal bleed requiring interventional radiology coiling of the source artery. There were no re-operations and no patient required dialysis. On echo all patients had no, trivial or mild mitral regurgitation. There was 0% mortality and no peri-operative case of CVA or other major mobidity.
Conclusions Minimally invasive mitral valve repair is a feasible and beneficial option in mitral surgery. It has a learning curve and team training and proctoring are essential when developing it in a surgical unit. It has the potential to enhance patient care in a select group of patients.

30 PAST, PRESENT AND FUTURE PRACTICE OF SURGICAL VERSUS TRANS-CATHETER AORTIC VALVE REPLACEMENT: A NORTHERN IRELAND PERSPECTIVE

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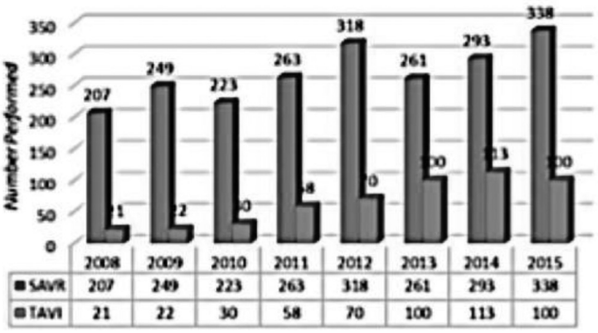
10.1136/heartjnl-2017-ICS17.30

Introduction Trans-catheter aortic valve implantation is now a Class 1 recommendation for high-risk patients alongside surgical aortic valve replacements and a Class 2 a recommendation for intermediate risk patients (AHA 2017 guidelines). The purpose of this study was to evaluate the change in clinical practice of surgical aortic valve replacement (SAVR) since the introduction of trans-catheter aortic valve implantation (TAVI) in Northern Ireland.

Methods A retrospective analysis was conducted on data collected from all patients who underwent SAVR and TAVI between 2008 and 2015. Patients who underwent emergency or salvage surgery, including those who underwent surgery for infective endocarditis were excluded from the analysis. TAVI and SAVR patients were compared for preoperative risk profile and short-term outcomes including in-hospital mortality and postoperative length of stay.

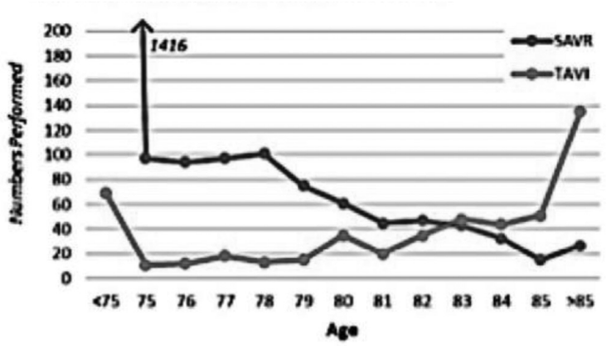
Results In total, 2152 SAVR and 517 TAVI procedures were performed during that period. Patients undergoing SAVR were younger than those undergoing TAVI (mean age 67.7 ±12.2 vs. 81.8±6.6 years) and had a lower preoperative logistic European System for Cardiac Operative Risk Evaluation (EuroSCORE) risk profile with a mean EuroSCORE of 8.2% ±8.9% vs. 18.6% ±11.8% (Table 1). The number of SAVR procedures increased from 207 in 2008 to 338 in 2015, while the number of TAVI increased from 21 in 2008 to 100 in 2015 (Figure 1). A reduction in SAVR was seen in octogenarian patients corresponding to increase in TAVI in the same age group (Figure 2). A reduction in concomitant SAVR was also seen from 2013 onwards, in line with increasing number of TAVIs with previous PCI (Figure 3). Postoperative length of stay also decreased in both groups from 13.7 to 12 days after SAVR and from 10.7 to 4.4 days after TAVI. In-hospital mortality decreased in both groups between 2008 and 2015, from 2.9% to 0.3% with SAVR and from 4.8% to 2.0% with TAVI (Figure 4).

Conclusion The findings demonstrate that both TAVI and SAVR practice has increased, paralleled with improved hospital outcomes. The latter is likely the result of good patient selection due to a robust MDT process. We estimate an increase in the utilisation of TAVI in the coming future as a result of the increasingly ageing population as witnessed over the last 3 years.

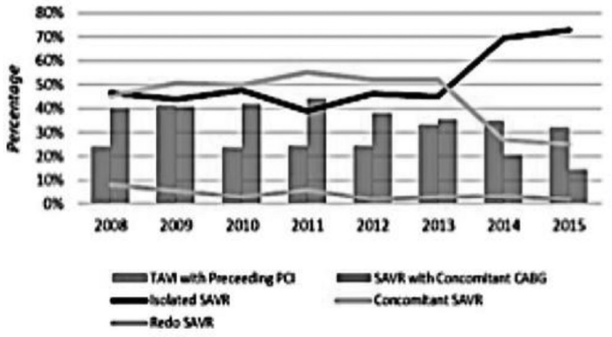


	2008	2009	2010	2011	2012	2013	2014	2015
SAVR	207	249	223	263	318	261	293	338
TAVI	21	22	30	58	70	100	113	100

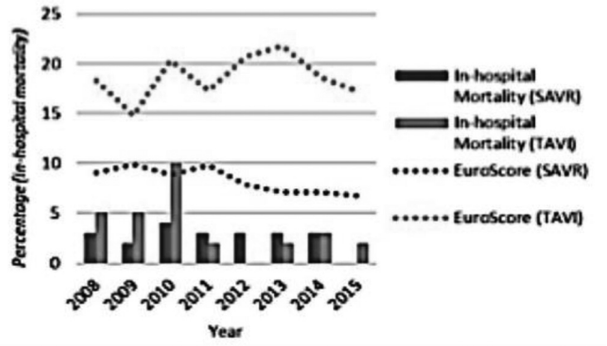
Abstract 30 Figure 1



Abstract 30 Figure 2



Abstract 30 Figure 3



Abstract 30 Figure 4

Abstract 30 Table 1 Patient Characteristic

Characteristics	SAVR (N=2152)	TAVI (N=517)	p Value
Pre-Operative			
Age (Mean)	67.7±12.2	81.8 ± 8.6	p<0.0001
Female Sex – no. (%)	774 (36%)	292 (56%)	p<0.0001
Estimated Logistic EuroSCORE (%)	8.2 ± 8.9	18.6 ± 11.8	p<0.0001
COPD – no. (%)	355 (16%)	156 (30%)	p<0.0001
Aortic-valve pathology - Stenosis – no. (%)	1551 (72%)	433 (84%)	p<0.0001
Coronary intervention – no (%)	639 (30%)	156 (30%)	p=0.83
Concomitant procedure (AVR + Other) – no (%)	903 (42%)	0 (0%)	N/A
Previous Sternotomy	80 (4%)	103 (20%)	p<0.0001
Early Outcomes			
Median LOS (days)	12.2 ± 10.1	7.3 ± 8.0	p<0.0001
In-hospital mortality	2.2% ± 1.2%	3.5% ± 3.1%	p=0.30

*COPD denotes chronic obstructive pulmonary disorder, LOS length of stay.

Oral abstract presentations 3

31 EIGHT YEARS OF CARDIAC SCREENING IN HIGH RISK IRISH POPULATION

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10.1136/heartjnl-2017-ICS17.31

Introduction Sudden cardiac death (SCD) is defined as death from cardiac arrhythmia within one hour of symptom onset. Aetiology may be structural cardiac conditions including ischaemic heart disease (IHD) which is multifactorial in origin, and cardiomyopathies including hypertrophic cardiomyopathy (HCM), dilated cardiomyopathy (DCM), and arrhythmogenic cardiomyopathy (AC, previously known as ARVC), all of which may be genetic in origin and inherited. Sudden arrhythmic death syndrome (SADS) is SCD with structurally normal heart at post mortem. Primary arrhythmic syndromes causing SADS include long QT syndrome (LQTS), Brugada syndrome (BrS) and catecholaminergic polymorphic ventricular tachycardia (CPVT), again often hereditary. In addition to coping with a devastating loss, families are faced with a fear that surviving family members could be affected. Could preventable action amongst the surviving at risk of SCD be undertaken? Can people with no risk be reassured? These are the purpose of this cardiac screening facility. The Centre for Cardiac Risk in Younger Persons (CRYP), a largely charitably funded service was opened in Tallaght Hospital in 2007, with a full-time dedicated facility open since November 2008. Assessment of surviving relatives and affected individuals is led by a consultant cardiologist with specific training in inherited cardiac conditions. The assessment includes taking a complete history with compilation of detailed family pedigree, examination, non-invasive cardiac investigations and, where appropriate genetic analysis collaborating with the Centre for Medical Genetics, Our Lady's Children Hospital. Post mortem reports of deceased relatives are always obtained. Baseline cardiac investigations include electrocardiogram (ECG), echocardiogram (ECHO), exercise stress test either bicycle (WHO protocol) or treadmill (Bruce Protocol) and Holter monitor for up to 7 days. Drug provocation (Ajmaline and Epinephrine) tests are done to unmask BrS and LQTS or CPVT as appropriate. Further diagnostic tools may be employed including loop recorders (external and internal), coronary angiography (invasive or CT), cardiac magnetic resonance imaging and electrophysiological testing.

Methods This is a retrospective review of all patients seen in the CRYP from November 2008 to end 2015. Percentages were calculated based on number of individuals or families reviewed as appropriate.

Results 4778 individuals representing 3486 families were assessed (many attending on multiple occasions over the time period for follow-up). 54% were males. Individuals were classified according to reason for referral (e.g. diagnosis in the family) and or conditions identified. These results are presented in Table 1. Table 2 summarises further breakdown of the SADS family screening. In total 17% of 1056 individuals were diagnosed with a cardiac condition, and 83% of 1056 individuals could be reassured and discharged. 1934(40 %) of all normal individuals continue to attend for further investigations.

Abstract 31 Table 2 Individuals screened due to family members with SADS further breakdown

Condition	Number of individuals, N=n / (%)
Total (N=n, X=number of families)	1056, 723
Individuals Normal Dx	880 (83%)
Individuals with Positive Dx	122 (17%)
LQTS	43 (35%)
Cardiac significant	17(14%)
Vasovagal syncope (VVS)	16(13%)
Supraventricular tachycardia (SVT)	16(13%)
IHD	14(11%)
DCM	6(5%)
Cardiac significant	5(4%)
CPVT	3(2%)
BruS	1(1%)
HCM	1(1%)
No diagnosis	54(5%)

Abstract 31 Table 1 Individuals screened based on diagnosis or conditions identified in CRYP unit (2008–2015)

Diagnosis	Numbers evaluated N=n, (No of Families)	Individuals with positive diagnosis	% families screened with positive findings
Total	4778		
SADS	1056(723)	122 (17%)	22
HCM	628(523)	120 (19%)	23
IHD	627(459)	94 (15%)	20
LQTS	436(316)	139 (32%)	44
DCM	344(195)	41 (12%)	21
ARVC	138(27)	30 (22%)	111
CPVT	58 (8)	14 (24%)	175
BrS	57(17)	7 (12%)	41
Other Dx	1434(1218)	380(26%)	31

Conclusions A significant number of individuals and families have benefited from the largely charitably funded dedicated service over the 7 year period presented. Contrary to published prevalence from other populations including the USA, LQTS is the most common diagnosis in our population followed by HCM. A large number of patients with cardiac conditions have been identified hopefully protected from the worst possible consequences of their conditions. Of equal importance a large number of unaffected individuals have been reassured and can benefit from the improved quality of

life such peace of mind brings. The remainder of patients who are currently unaffected, in the absence of clinically useful genetic results, will require long-term follow-up in circumstances where conditions such as cardiomyopathies which display age-related penetrance are a risk. Expansion and public funding of facilities such as ours should, in our opinion, be considered a priority for the Irish population.

32 NURSE-LED DC CARDIOVERSION SERVICE AT ALTNAGELVIN AREA HOSPITAL

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10.1136/heartjnl-2017-ICS17.32

Introduction Atrial Fibrillation (AF) is the most common arrhythmia and is associated with an increased risk of thromboembolic events. Direct Current Cardioversion (DCC) is a routine elective treatment to attempt to restore sinus rhythm in patients with atrial fibrillation/flutter. This usually requires one to two medical doctors and a cardiology nurse to assist. A delay in medical staff being able to perform the DCC due to their workloads, led to longer waiting times for patients, increasing the length of their bed stay thereby increasing pressure on cardiac beds in a busy coronary care unit (CCU). To address this problem, a nurse led DCC service was set up. The aim was to provide a safe and efficient service for patients.
Methods A nurse led cardioversion pathway was created in January 2017 in consultation with the Cardiologists and Pharmacy. All referrals originated from a Cardiologist, All patients referred by a Cardiologist who were haemodynamically stable were considered for Nurse Led DCC after eligibility criteria were met. All patients had to be taking anticoagulation for at least 4 weeks. Pre-procedural details were obtained including consent, medical history, medications, allergies, and physical examination. All patients had bloods and echocardiography performed before being included in the service. DCC was performed using the Trust conscious sedation policy using midazolam. Post procedure monitoring was done until discharge. Data including anticoagulant status, (NOAC/warfarin), referral source, sedation requirements, number of shocks, pad position, adverse reaction, anaesthetic involvement and length of stay were recorded for continuous audit purposes immediately post DCC, at discharge and at 6 week's review. Length of stay was compared to doctor led procedures for similar time period.
Results A total of 24 Nurse led DCCs have been performed since the service began with 92% achieving sinus rhythm following DCC. Nurse led DCC length of stay was significantly less than Doctor led DCC length of stay leading to higher patient satisfaction (420 minutes vs. 240 minutes, $p<0.05$).

Data collected to date also suggests a trend towards lower amounts of sedation being used by the nurse led DCC service, enhancing patient outcome and higher patient satisfaction.

NOACs were the anticoagulant of choice in 24/24 (100%) cases. None of the patients were taking Warfarin avoiding the need to cancel procedures if the INR was sub-therapeutic in the weeks leading up to the day of the procedure.
Conclusion A Nurse led DCC service appears to be safe, efficient and effective way to treat AF. Such a service reduces the length of stay and increases patient satisfaction. We hope to extend this service into more complex patients that are currently excluded and will continue to audit this very worthwhile service.

33 THE DIAGNOSTIC YIELD OF SCREENING FIRST-DEGREE RELATIVES IN SUDDEN ARRHYTHMIC DEATH SYNDROME

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10.1136/heartjnl-2017-ICS17.33

Introduction While the commonest cause of sudden death remains coronary artery atherosclerosis, when detailed post mortem examination fails to find any abnormality in an individual with no history of cardiac disease, the term sudden arrhythmic death syndrome (SADS) is applied. Conditions that may result in SADS are often familial and screening of first-degree relatives according to a protocol of clinical assessment and cardiac investigation is frequently undertaken. We aimed to assess the diagnostic yield of this approach in individuals referred to the Belfast Trust Inherited Cardiac Conditions Clinic because of SADS in a first degree relative.
Methods Retrospective analysis of clinic databases between January 2012 and December 2015 was undertaken. Where SADS was listed as reason for attendance, it was confirmed the patient was a first degree relative of the deceased and that post-mortem including toxicological analysis had failed to reveal a cause of death. The outcome and conclusions of screening in each individual were then assessed using medical records and cardiac investigation databases.
Results We identified 55 incidents of SADS with referral of first-degree relatives for screening. Data were available on 97 individuals, at least one from each family. All those screened had a standard resting 12 lead ECG, 96% had a transthoracic echocardiogram, 89% had an exercise stress test, 88% had ambulatory ECG monitoring, 69% had an ajmaline challenge. Based on screening of first-degree relatives, a diagnosis was made in 6 (10.9%) families and 8 (8.2%) individuals. In four families, one individual was diagnosed with Brugada Syndrome based on a Type 1 ECG response to ajmaline. In another family, 1 individual had QT prolongation on repeated ECGs without apparent secondary cause or genetic explanation on standard testing. In the remaining family, 3 members were shown to have QT prolongation on 12 lead ECGs and each carried the same mutation in KCNH2, consistent with long QT syndrome, type 2.
Discussion These findings suggest that in SADS cases, the diagnostic yield from a strategy based solely on screening of first-degree relatives is low. Our protocols are consistent with other centres. The highest yield investigations appear to be resting 12 lead ECG and ajmaline challenge. It is important that each individual attends screening under such difficult circumstances is made aware that the process may well provide reassurance but is unlikely to yield a definitive cause for their loved ones death. In the majority of SADS cases, precise diagnosis remains elusive. This provides an opportunity for improvement through continued development of molecular autopsy panels linked to large bioinfomatic databases.

34 PROTEOMIC AND MICRO RNA BIOMARKER DISCOVERY TO IDENTIFY NOVEL MARKERS OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN PATIENTS WITH DIABETES

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10.1136/heartjnl-2017-ICS17.34

Introduction The need for biomarkers to identify cardiac dysfunction in patients with diabetes (DM) is becoming increasingly pressing due to the global rise in disease prevalence and reducing healthcare resources to detect and manage these complications. With the risk of heart failure being 2–5 fold greater in those with diabetes, early identification of cardiac dysfunction may facilitate more timely management and reduce or delay future heart failure development. The aim of this ongoing study is to identify serum protein and micro RNA (miRNA) biomarker signatures that can be used to diagnose asymptomatic left ventricular diastolic dysfunction (LVDD) in diabetic patients.

Methods The biomarker discovery cohort consisted of a selected subset of 200 patients from within the STOP-HF population. Four pooled age- and gender-matched groups of 50 patients were analysed, with and without DM and with and without asymptomatic LVDD. LVDD was defined on echocardiography as left atrial volume index $\geq$34 ml/m^2 and E'<10 cm/sec. For proteomics biomarker discovery, samples were enriched via immune-depletion and digested using trypsin before being run on a Q-Exactive mass spectrometer (Thermo Scientific). For miRNA analysis, Taqman array cards were used which have 745 microRNA Taqman probes on a 384-well micro-fluidic card (Applied Biosystems).

Results The proteomics and miRNA discovery analysis identified over 70 potential biomarkers that were differentially expressed in patients with both diabetes and LVDD compared with the other three discovery groups. GO-Term enrichment analysis revealed a significant involvement of processes relating to inflammation, including Humoral immune response, Complement activation, and Acute inflammatory responses (q-values: 1.00 E-30, 1.00 E-30, 1.00 E-30 respectively).

Conclusion Verification and validation of the diagnostic potential of these novel protein and miRNA biomarkers candidates may support future strategies for the early identification and monitoring of LVDD in diabetic populations. Furthermore, functional analysis and identification of disease relevance of these biomarkers could highlight new therapeutic targets, including novel anti-inflammatory approaches.

35 THE AMBULATORY CARDIOLOGY UNIT; REDUCTION OF ADMISSIONS AND PATIENT OUTCOMES AFTER 1 YEAR

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10.1136/heartjnl-2017-ICS17.35

Introduction Recent developments in health service reform in Northern Ireland have seen the publication of the Bengoa Report, Systems, Not Structures, [1] which clearly states that "something very different has to happen at the delivery of care level." Maintenance of existing services is not sustainable, and new methods of managing health care needs must be developed and evaluated. In 2015, the Belfast Trust piloted an Ambulatory Cardiology Unit (ACU). The ethos of ACU was to reduce pressure on the ED by providing a unit where rapid evaluation, treatment and follow-up could be provided by the Cardiology team, and at the same time reduce in-patient admissions to Cardiology beds. Here we report on the experience of an Ambulatory Cardiology Unit during the first year of service.

Methods In order to measure the impact of the new service, a pre- post design was used for comparison with admission rates for 1 year after the initiation of ACU with admission rates in the preceding year, when there was no alternative to in-patient admission or out-patient care. In addition, a database was maintained for all ACU patients. This allowed the team to not only keep track of how many patients were seen and which conditions were treated in the ACU, but also allowed for follow-up for unscheduled care re-attendance, admission to hospital and mortality at 30 days, 6 months and 1 year.

Results Activity; 946 new patients were seen in the first year. 698 reviews were carried out within the first year, bringing the total number of patient episodes to 1644. Reduction in admissions; There was an overall decrease in cardiology admissions of 13.5% over a period of 1 year. Admissions with AF were reduced by 24% and syncope by 29%. There was a reduction of 45% in admissions with Pericarditis. Outcomes at 30 days – unscheduled re-attenders, n=60. Admissions, n=25. Admissions with same condition as originally seen in ACU, n=4 (0.4% of patients seen). Mortality n=4 – none from the same cause as original referral. Outcomes at 6 months – Unscheduled re-attenders, n=217. Admissions, n=60. Admissions with same condition as originally seen in ACU, n=12 (1.3 % of patients seen). Mortality n=12–2 from the same cause as original referral (end-stage HF). This equates to 0.2% of all patients seen.

Conclusion Our unit has demonstrated that it has been possible to reduce admissions to cardiology in-patient beds by 13.5%, and patient outcomes indicate that the service is safe with only 1.7% admitted for the same reason as originally seen and only 0.2% mortality from the same condition as originally seen in ACU. Although this is a very small service, it has made an impact and demonstrates an alternative way of working. In the current climate, where ministers and clinicians agree that current methods of managing emergency care are unsustainable, our service represents a model which could be implemented by other specialities.

Moderated poster session 2

36 VARIABLE DIAGNOSTIC ACCURACY IN READING ECGS IN A NURSE-LED PRIMARY PCI PATHWAY

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10.1136/heartjnl-2017-ICS17.36

Background The Electrocardiogram (ECG) remains as the crucial tool to diagnose acute ST-elevation myocardial infarction (STEMI). Activation of the cardiac catheterization team to perform Primary Percutaneous Coronary Intervention (PPCI) largely depends on the interpretation of the ECG at the time of first medical contact with the patient. In Northern Ireland, if the referrer decides that the ECG shows a STEMI they would then transmit the ECG to a designated Coronary Care Nurse who

then decides whether to activate the PPCI pathway or to transfer the patient to the nearest Emergency Department (ED).

Objective We sought to ascertain the impact, ECG based decisions have on the PPCI pathway and specifically on clinical outcomes.

Methods ECG and clinical data were retrospectively reviewed for consecutive patients referred to the PPCI pathway over an 8-month period as part of a continuous audit. Patients were either accepted or turned down for PPCI by the Nurse. All ECGs were retrospectively adjudicated upon with a final diagnosis made by a senior Coronary Care nurse and Interventional Cardiologist. ECG interpretation was evaluated in the referrer group, the ECG machine, and the nurse activator.

Results A total of 344 patients were referred to the PPCI pathway over the 8-month period. 114 (33%) were accepted for PPCI. All accepted patients met diagnostic ECG criteria with 97/114 (85%) having a final diagnosis of STEMI. 230 referrals (67%) were turned down for PPCI, predominantly on the basis of lack of diagnostic criteria. All turndowns were considered appropriate. Paramedics were the main referrers 205/344 (60%) with the remainder from ED. The ECG machine suggested an ischaemic diagnosis in 95/97 (Sensitivity=98%) of patients with STEMI and 103/198 (1-Specificity=52%, Specificity=48%) of the turndown cases (patients with a final diagnosis of ACS/angina were excluded from the turndown group when calculating machine specificity). Of those referred for PPCI, 66% of the ED referrals were turned down. Of those referred by Paramedics for PPCI 67% were turned down. The STEMI group were significantly younger that the turndown group (63 ± 12 vs. 68 ± 17, $p<0.01$) with higher mortality in the turndown group at 12 months (17.1% vs. 10.5%). No STEMIs were missed.

Conclusions ECG interpretation by referrers in this nurse-led primary PCI pathway is sub-optimal. The high rate of false positives in ECG machine diagnoses in the turndown group could be an influencing factor in the human-decision making. There is a need to find ways to improve ECG interpretation, particularly in a time critical PPCI pathway.

37 OPTICAL COHERENCE TOMOGRAPHY TISSUE COVERAGE AND CHARACTERIZATION BY GREY-SCALE SIGNAL INTENSITY ANALYSIS POST BIFURCATION STENTING WITH NEW GENERATION BIOABSORBABLE POLYMER EVEROLIMUS-ELUTING STENTS

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10.1136/heartjnl-2017-ICS17.37

Introduction Bifurcation stenting has historically been associated with higher rates of adverse clinical events. Optical coherence tomography (OCT) surveillance including grey-scale signal intensity (GSI) analysis provides information on vessel wall healing and can differentiate mature from immature tissue coverage after stent implantation. We sought to evaluate OCT-assessed healing of a novel thin-strut bioresorbable polymer everolimus-eluting stent after 3–6 months post bifurcation stenting.

Methods Patients receiving bifurcation stenting with a planned two-stent approach using a thin-strut bioresorbable polymer everolimus-eluting stent and having an OCT surveillance data collected at 3–6 months post stenting follow-up were included in this study. OCT was performed using commercially-available frequency domain OCT imaging system. Raw data of OCT image acquisitions were collected and sent to a centralized core laboratory. Morphometric analysis of contiguous cross-sections was performed at 1 mm longitudinal intervals within the stented segment (QIvus 3.0.26.0 software). GSI analysis of tissue overlying stent struts was also performed. For each cross-section, the neointimal region of interest (ROI) above each covered stent strut was delineated and 256-level GSI was measured for every pixel within the ROI (Image J software). Tissue coverage was classified as mature or immature according to a standard cut-off values derived from prior published studies (91.6 if strut calibration, 109.7 if guidewire calibration).

Results Data on a total of 31 vessels from 17 treated patients was available at a median of 5 months post stenting. Morphometric analysis revealed the mean length of stented segments to be 27.68 ±16.35 mm. The mean minimum lumen area was 5.97 ±2.97 mm ^{2} while the minimum stent area was 6.67 ±2.63 mm ^{2}. Average lumen area was 8.27 ±2.97 mm^2 while the average stent area was 9.02 ±2.95 mm^2. The total number of frames assessed was 869, with a total of 9,975 visible struts. Overall strut coverage was 96.93%, while 0.34% of struts were malapposed. The mean thickness of neointimal coverage was 101.47 ±42.16μm, while the mean neointimal area was 0.75 ±0.49 mm^2 and the mean percentage stenosis 9.18±7.45%. A total of 28 lesions and 7,971 neo-intimal regions of interest (ROIs) were assessed using GSI analysis. The mean GSI score was 95.11. A total of 53.79% of ROIs were classified as mature. Scatter plot of the GSI scores is depicted in Figure 1, Panel A, while the distribution of immature and mature ROIs is displayed in Figure 1, Panel B.

Conclusions At 3–6 months after implantation of thin-strut bioresorbable polymer EES in bifurcation lesions using a planned two stent approach, antirestenotic efficacy was high and rates of uncovered and malapposed struts was low. GSI analysis showed that more than half of neointimal areas analysed were classified as mature in keeping with well advanced vessel healing.

38 ONE-YEAR OUTCOME OF MULTI-VESSEL PCI VERSUS STAGED PCI IN ST ELEVATED MYOCARDIAL INFARCTION

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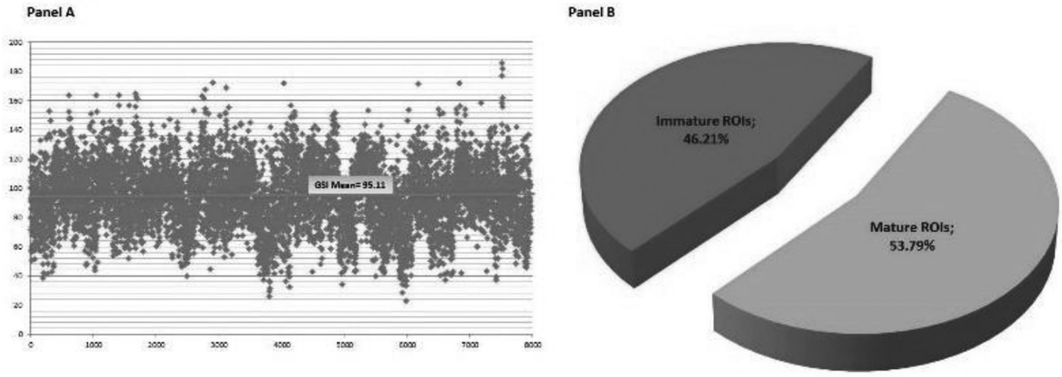
10.1136/heartjnl-2017-ICS17.38

Background In patients with multivessel coronary artery disease presenting with STEMI, the CVLPRIT and PRAMI trials recommend undertaking only culprit artery PCI at the time of Primary PCI (PPCI); staged revascularization may then be performed at a later stage, in the days to weeks after PPCI.

Purpose The aim of this study was to review patients presenting with STEMI and multivessel disease and compare one-year outcomes of those undergoing multivessel PCI (MVPCI) at the time of PPCI to those undergoing staged PCI after initial acute culprit artery intervention.

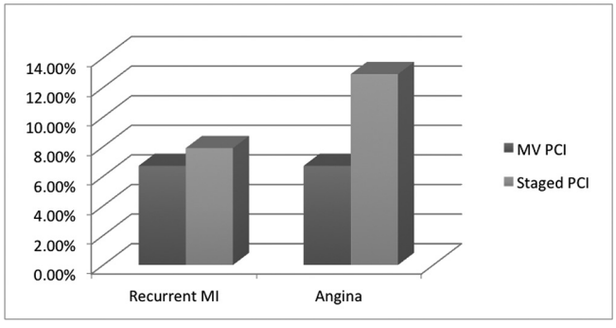
Methods St. James's Hospital is Dublin's largest PCI centre. We identified all patients undergoing PPCI for STEMI between January and December 2015 using the Code STEMI database. Electronic health records, chart review and HIPE data were used to further characterize patients. The number



Abstract 37 Figure 1 Figure 1A: Scatter plot of GSI scores Figure 1B: Distribution of immature and mature ROIs

of patients undergoing MVPCI during index procedure was recorded, as was the number undergoing staged intervention. Those referred for CABG were excluded from further analysis Average patient length of stay and need for re-intervention and mortality at one year were noted.

Results There were 417 patients with a confirmed diagnosis of STEMI, either clinically or angiographically; out of this 364 (87.2%) underwent PPCI. 153 patients (36.6%) presenting with STEMI had multi-vessel coronary artery disease, 136 (88.8%) had PCI and 17 (11.2%) had CABG. Of the 136 undergoing PCI for multi-vessel disease, 59 (43.4%) underwent MVPCI during PPCI; the average age of this group was 61 years and 12 (21%) were female. 77 (56.6%) patients underwent staged PCI, the average age was 62 years and 13 (17%) were female. Of those undergoing staged PCI 21 (27%) occurred during the index patient admission and 56 (73%) occurred as an outpatient. Within one-year of follow-up 4 (6.7%) in the MVPCI group and 6 (7.8%) in the staged PCI group had represented with recurrent MI requiring further revascularization, thus the relative risk of MVPCI patients presenting with recurrent MI was 0.8701, though the p value was non-significant at 0.82. 4 patients (6.7%) in MVPCI and 10 patients (12.9%) in staged PCI represented with angina, this represents a relative risk of 0.522, again with a non-significant p-value of 0.25. 1 patient died in MVPCI group, though this was due to non-cardiac causes; there were no deaths in the staged PCI group. Median hospital stay was 8.4 days (range 4.4–17.7) in the MVPCI group and 6.3 days (range 3.3–26.2) in the staged intervention group.



Abstract 38 Figure 1 One year outcome multi-vessel PCI

Conclusion In the largest Irish Primary PCI center, we found there no significant difference in patients representing with recurrent MI requiring repeat revascularization in multivessel PCI as compared to staged PCI. There was a trend for those undergoing staged PCI to represent with more angina than those undergoing MVPCI, though this did not reach statistical significance. There was no difference in length of stay between cohorts.

39 LONG-TERM OUTCOMES OF A RANDOMIZED COMPARISON OF DRUG-ELUTING STENTS VERSUS BARE METAL STENTS IN SAPHENOUS VEIN GRAFT LESIONS – 5-YEAR FOLLOW-UP OF THE ISAR-CABG TRIAL

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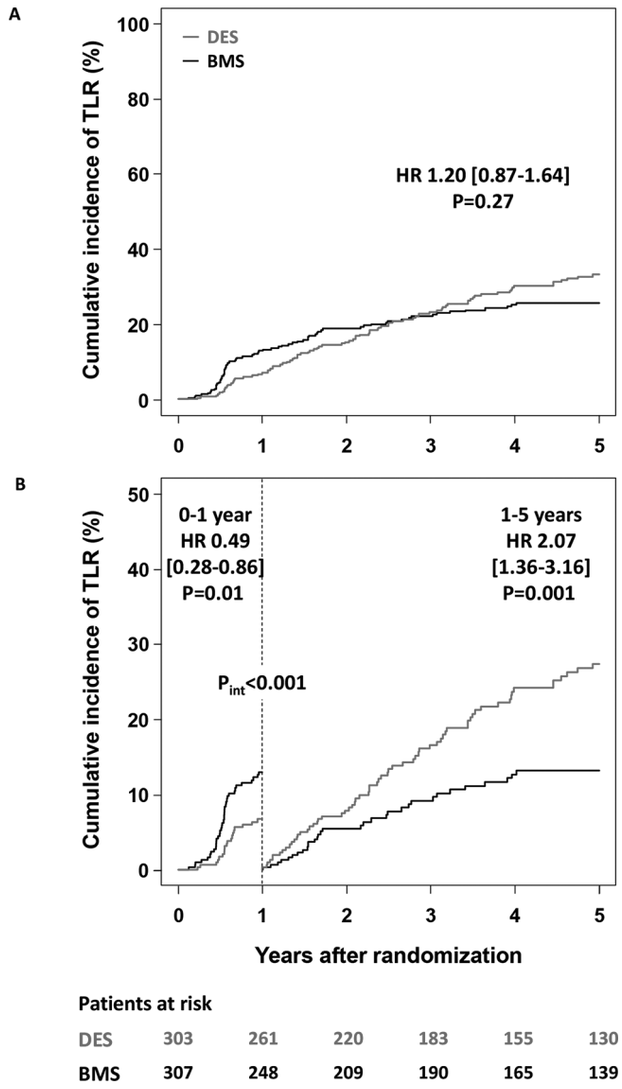
10.1136/heartjnl-2017-ICS17.39

Background In the ISAR-CABG (Is Drug-Eluting Stenting Associated with Improved Results in Coronary Artery Bypass Grafts?) trial, clinical outcomes at 1 year were superior in patients randomized to treatment of saphenous vein graft lesions (SVG) with drug-eluting stents (DES) compared with bare metal stents. The aim of this analysis was to compare clinical outcomes between treatment groups at 5-year follow-up.

Methods Patients with symptoms or objective evidence of myocardial ischaemia in the presence of >50% de novo stenosis of saphenous vein grafts undergoing PCI were randomly allocated (1:1) to treatment with DES or bare metal stents. Within the DES group, patients were randomized (1:1:1 allocation) to treatment with one of 3 drug-eluting stent types: early generation paclitaxel-eluting stent or sirolimus-eluting stent or new generation biodegradable polymer sirolimus-eluting stent. The primary endpoint was the combined incidence of death, myocardial infarction, or target lesion revascularization (TLR). Secondary endpoints were the combined incidence of death or myocardial infarction, TLR and definite stent thrombosis.



Abstract 39 Figure 1

Results 610 patients were randomized to treatment with DES (n=303) or BMS (n=307). There were no differences in baseline clinical, lesion or procedural characteristics between treatment groups. At 5 years, the primary endpoint occurred in 159 (55·5%) patients in the DES group vs. 157 (53·6%) patients in the bare metal stent group (hazard ratio [HR] HR 0·98, 95% CI 0·79–1·23, P=0·89): death or myocardial infarction in 93 (32·8%) versus 108 (36·6%) patients (HR 0·85, 95% CI 0·64–1·12, P=0·24) and target lesion revascularization in 84 (33·1%) vs. 69 (25.5%) patients (HR 1·20, 95% CI 0·87–1·64, P=0·27) (Figure, Panel A), respectively. The incidence of definite stent thrombosis was in 5 (2·0%) vs. 1 (0·4%) patients in the DES and bare metal stent groups, respectively (5·11 (0·60–44·72), p=0.14). There was an interaction between the treatment effect with time for both the primary endpoint and TLR ($P_{interaction}$=0·004 and <0.001, respectively). Landmark analysis showed that despite significantly lower rates of the primary endpoint and TLR in the DES group compared with the bare metal stent group at one year, between 1 and 5 years, the primary endpoint occurred numerically more frequently in the DES group (HR 1·28, 95% CI 0·97–1·68, P=0·08), driven by a significantly higher rate of TLR (HR 2·07, 95% CI 1·36–3·16, P=0·001) (Figure, Panel B). There was no significant difference in incidence of any endpoint among the 3 groups randomized to treatment with the 3 DES types studied.

Conclusion In patients undergoing treatment of SVG lesions, the clinical advantage of DES over bare metal stents demonstrated at 1 year was not sustained at 5-year follow-up due to higher attrition of efficacy in the DES group.

40 TRANSCATHETER PARAVALVULAR LEAK CLOSURE; A SINGLE CENTRE EXPERIENCE

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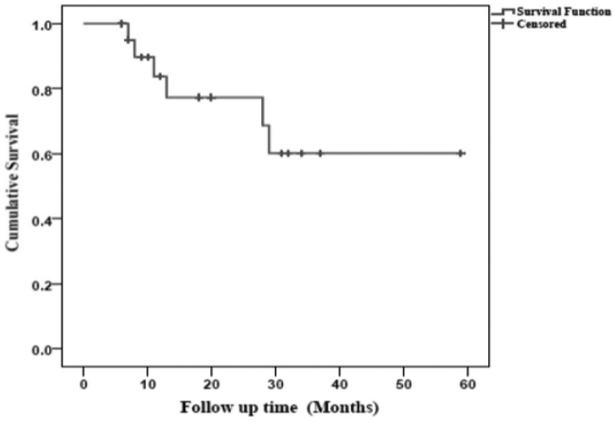
10.1136/heartjnl-2017-ICS17.40

Introduction Significant paravalvular leak (PVL) is estimated to occur in at least 1–2% of patients undergoing surgical aortic and/or mitral valve replacement, and 3–4% of patients undergoing percutaneous aortic valve replacement (TAVR). Surgery for repair of PVL is associated with a 30-day mortality of approximately 10%. Percutaneous closure of PVL has emerged as an alternative to surgical repair.

Methods Using a prospective registry, we sought to examine the clinical outcomes of patients treated with percutaneous closure of PVL at a tertiary referral hospital in Ireland.

Results A total of 21 patients (mean age 68 ±13 years, 76% male) were treated for PVL. Heart failure (HF) and haemolysis (HL) were the presenting symptoms in 62% and 24% of patients, respectively. The remaining 14% of patients presented with both HF and HL. Of the 21 prosthetic valves treated, 9 were in the mitral position, and 12 were in the aortic position. A total of 26 PVL procedures were performed in the 21 patients (mean of 1.2 procedures/patient). The mean number of plugs used per patients was 1.9 (range 0–4). There was one (3.8%) major adverse procedural complication (stroke) and two minor (7.7%) procedural complications (both vascular access complication treated with endovascular techniques). Among patients with HF as the presenting symptom (n=16), the mean NYHA class before and after percutaneous PVL closure was 2.6 ±0.62 versus 1.5 ± 0.63. None of these patients have required repeat surgery over a median follow-up of 20 months (IQR 9.5–32). Among patients with HL, clinical success was achieved in 2 of 5 patients (40%). A total of 6 deaths (28%) occurred in the patient cohort over a mean follow-up of 22 ±13.4 months. Thirty-day mortality was 0%. Figure 1 shows the Kaplan Meier Estimate of survival.

Conclusions Patients with PVL represent a high-risk patient cohort. Percutaneous PVL offers a safe alternative to surgical PVL repair, and appears particularly effective in those patients who present primarily with HF as their presenting symptom.



Abstract 40 Figure 1 Kaplan-Meier curve showing survival free from death by any cause

General poster session 2

41 CARDIOGENIC SHOCK OUTCOMES FOLLOWING PRIMARY PERCUTANEOUS CORONARY INTERVENTION: AN AUDIT OF THE SERVICE AT THE ROYAL VICTORIA HOSPITAL BELFAST

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10.1136/heartjnl-2017-ICS17.41

Introduction Mortality rates in patients with acute myocardial infarction (MI) complicated by cardiogenic shock remain high. There are few randomised control trials which have looked at this. The role of primary percutaneous coronary intervention (PCI) in cardiogenic shock was evaluated in the 1999 'Should we emergently revascularize Occluded Coronaries for Cardiogenic shocK' (SHOCK) trial, which showed that mortality at 30 days was not significantly reduced by early revascularization. We have considered the outcomes of patients presenting to a tertiary centre in a contemporary time period who underwent PCI.
Methods We reviewed PCI performed in the calendar year 2015 as coded on the Cardiovascular Imaging and Information System (CVIS) with cardiogenic shock and outcomes checked with the Northern Ireland Electronic Care Record (NIECR). Cardiogenic shock was coded by a cardiologist and defined as systolic blood pressure <80 mmHg despite hydration or requiring immediate inotropes, intra-aortic balloon pump (IABP) or autopulse support. The dataset included demographic characteristics: gender, age, diabetes mellitus (DM), smoking status, previous MI/ coronary artery bypass grafting (CABG)/PCI; procedural characteristics: access, coronary disease, thrombolysis in MI (TIMI) flow pre- and post-PCI, level of cardiac support; and mortality details: time from presentation, cardiac support, and extent of coronary artery disease.
Results There were 1833 PCI cases in 2015, of which 558 (30%) were elective and 1275 (70%) were emergency. Cardiogenic shock only occurred in the emergency cohort, of whom 73 (6%) were affected. The median age of patient affected by cardiogenic shock was 70 years (41–96 years), of whom 47 (64%) were male, 19 (26%) had previous MI, 7 (9.5%) had previous CABG, and 13 (27%) had previous PCI. DM affected 22 (30%), 31 (42.4%) were smokers, and 19 (26%) had known poor left ventricular (LV) function. Triple vessel disease was present in 21 (29%). Stent thrombosis occurred in two cases. Glycoprotein IIb/IIIa inhibitors were used in 33 (45%) cases, and 15 (21%) required admission to ICU.
Implications This audit has highlighted that 70% of the caseload at the Royal Victoria Hospital cardiac catheterisation laboratory is emergency. There was a 52% mortality rate in cardiogenic shock in the year 2015, which is comparable with the SHOCK trial. Patients who had previous MI, DM and poor LV function were more likely to have a poor outcome. These will have implications on the future suitability of intervention when multiple factors are present.

42 1 YEAR CLINICAL OUTCOMES FOLLOWING PRIMARY PCI FOR STEMI IN POST CARDIAC ARREST PATIENTS, WITH COMPARISON TO AN OVERALL STEMI POPULATION

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10.1136/heartjnl-2017-ICS17.42

Aims To retrospectively review patients who presented with a STEMI to a primary PCI centre between 1st January 2015 and 31st December 2015, and assess their 1 year mortality, refractory angina, unplanned revascularisation and heart failure, and to compare these data with patients who underwent Primary PCI following cardiac arrest or required inotropic support during the procedure.
Methods We used the hospitals STEMI registry to obtain patient records for all patients who presented between 1st January 2015 and 31st December 2015 with a STEMI. We used the local electronic records to obtain details about the initial presentation and follow up details.
Results 178 patients, 36 female (20.2%) presented to our institution with a STEMI during the study period. Mean age (mean (+/- SD)) was 62.9 years +/- 12.6. Follow up was obtained on 62.4% of patients, with a mean follow up of 11.8 months (+/- 5.4). 95.0% of patients underwent successful primary PCI. At 1 year, overall rates of complications were as follows: death 11.7%, refractory angina 3.6%, unplanned revascularisation 4.5%, non fatal MI 4.5% and heart failure 17.1%. 10 patients (5.6%) presented following cardiac arrest. 3 (1.7%) additional patients were commenced on inotropes during Primary PCI. For primary PCI patients following cardiac arrest or with commencement of inotropic support, the rates of complications at one year were as follows: death 46.2%, refractory angina 0%, non fatal MI 0%, unplanned revascularisation 0%, heart failure 38.5%.
Conclusions Mortality post STEMI at one year remains high at 11.7%, rising up to 46.2% in patients post – arrest or requiring inotropic support. The most frequent complication encountered following STEMI is heart failure, which is more frequent in the post arrest patient cohort.

43 COMPARING OUTCOMES IN PATIENTS UNDERGOING TAVI: GENERAL ANAESTHETIC VERSUS CONSCIOUS SEDATION

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10.1136/heartjnl-2017-ICS17.43

Introduction The Transcatheter Aortic Valve Insertion (TAVI) experience has been evolving globally for over a decade and a half. The first ever in-human TAVI was carried out in 2002 and was performed under mild sedation and local anaesthesia (1). As TAVI has progressed from a novel therapy to a mainstream treatment it has been adopted worldwide as the standard treatment for severe aortic stenosis in symptomatic patients who have contraindications or other considerations that are prohibitive to surgical aortic valve replacement (SAVR). Despite growing data on TAVI, consensus on best anaesthetic approach is yet to be reached. The recent WRITTEN survey of over 70,000 TAVI procedures worldwide reveals that general anaesthesia (GA) remains the preference in 60% of centres (2). Despite GA remaining the favored approach, a number of studies have demonstrated a trend towards conscious sedation (non-GA) (3 4). The advantages of conscious sedation over GA are thought to include improved recovery time and reduced reliance on anaesthetic staff. The impact of anaesthesia type on patient outcome was analysed using data from the recent CoreValve ADVANCE study. Using propensity score-matching analysis, the characteristics and outcomes of patients who underwent TAVI with either GA or non-GA were compared. The study demonstrated no statistical difference between GA and non-GA groups in all-cause mortality, cardiovascular mortality, or stroke through 2-year follow-up. Length of hospital stay was similar between the two groups (5).

Methods Using data from the newly formed Mater Hospital TAVI database we compared key patient outcomes against anaesthesia type. Patients were divided into general anaesthetic group (TAVI-GA), conscious sedation directed by anaesthesia staff (TAVI-SA) and conscious sedation directed by cardiology staff (TAVI-SC). Measured outcomes included procedure time, length of ICU stay, need for vasopressor support and over all length of hospital stay.

Conclusions The statistical analysis for this study is ongoing with results expected May 2017. Overall this study aims to add to the growing body of international data regarding anaesthesia choice in TAVI. It will also compare Mater Hospital data against similar studies. Looking to the future a randomised control trial would likely be the design of choice to help better reach an international consensus. Planning and implementing such a trial would be difficult given the clinical complexity of typical TAVI candidates by their nature.

44 SINGLE INSTITUTIONAL EXPERIENCE OF INTERRUPTED AORTIC ARCH REPAIR ASAD KHAN, MOHAMED ELRIH, YAMIN ALZAIN, PROF MARK REDMOND,JONATHAN MCGUINNESS,LARS NOLKE. PAEDIATRIC CARDIOTHORACIC SURGERY UNIT,OUR LADY'S CHILDREN'S HOSPITAL CRUMLIN DUBLIN

A Khan, M Elrih, J McGuinnes, L Nolke, M Redmond. *Our Lady's Children's Hospital Crumlin, Dublin, Ireland*

10.1136/heartjnl-2017-ICS17.44

Introduction Interrupted aortic arch (IAA) is a rare congenital heart disease and is often associated with other cardiovascular anomalies,including ventricular septal defect (VSD), truncus arteriosus,aorto-pulmonary window and various types of single ventricle.One staged repair of interrupted aortic arch (IAA) was first described by Barratt-Boyes et al.One-stage repair incorporating direct arch anastomosis was first described by Trusler in 1975.As outcomes of neonatal cardiac surgery have been improved, primary complete repair of IAA and concomitant congenital heart disease in neonatal period has been gradually applied in many institutions.

Methods Retrospective chart review and data base of patients operated for interrupted aortic arch from 2007 to 2016 has been reviewed.

Results 22 patients underwent interrupted aortic arch repiar between 2007 to 2016. Mean Age at the one stage repair was 5 day.Mean age at the second stage repair was 8 months.15 patients(68.1%) were female and 7 patients(31.8%) were male. Di George syndrome was associted in 9 patients(40.9%).Type B (81.9%) was the most common. Mean weight at one stage repair was 3.15 kg at one stage repair.A variety of concmmitent procedures were performed same time including VSD repair in 19 patients(86.3%),AP window repair in one patient (4.5%),Left pulmonary artery reimplntation in one patient (4.5%) and trucus arteriosus repair in one patient (4.5%). Mean total bypass time and cross clamp time was 174 minutes and 89 minutes respectively.The mean circulatory arrest time was 28 minutes.Postoperative mean ventilatory support was 6 days.The overall mortality was one patient(4.5%).

Conclusion Surgical outcomes for Interrupted aortic arch has significantly improved in last decade. One stage repair with concommitent procedures can be undertaken with good results.

45 MITRAL VALVE REPAIR – A SINGLE CENTRE 10 YEARS EXPERIENCE

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10.1136/heartjnl-2017-ICS17.45

Introduction Mitral valve repair surgery is the procedure of choice for degenerative mitral valve disease in symptomatic patients. There is a paucity of national records in mitral valve repair rates and outcomes in Ireland.

Aim We set out to review our mitral valve repair rates for degenerative disease as proposed by the local Heart Team / Joint Cardiology-Cardiac meeting recommendation.

Method A non-randomised retrospective observational study of prospectively collected data from an electronic patient database was conducted over a 10 year period.

Results There were a total of 53 mitral valve repair procedures (39 males/14 females; age 64.7± 12.3 years) carried out within a total number of 117 mitral surgical procedures in our unit from 2007 to 2017. Exclusion criteria included mitral stenosis, mitral regurgitation due to ischaemic heart disease, rheumatic valve disease and complex repair procedures involving extensive anterior leaflet pathology or annular calcification. Repair techniques included annuloplasty (96.2%), leaflet ressection (60.3%), neochords implantation (15.1%) and sliding plasty (9.4%). Concommittant procedures included tricuspid valve repair (15%), atrial fibrillation ablation (17%), CABG (5.6%) and AVR (7.5%). There were 2 intraoperative conversions resulting in mitral valve replacement which equates to a 96.2% repair rate among patients considered for mitral valve repair based on heart team recommendations. Clinical and echocardiographic follow-up was achieved in 94.3% of patients. During a median follow up of 63 months there were 2 cardiac deaths. Freedom from mitral regurgitation and reoperation rate were respectively 88.7% and 5.6%.

Conclusion Mitral valve repair can be carried out with satisfactory short and long-term results in centres with a dedicated interest.

46 ENHANCED PRO-INFLAMMATORY SYSTEMIC RESPONSE AND POTENTIAL VIRAL FACTOR IN CORONARY ARTERY ECTASIA

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10.1136/heartjnl-2017-ICS17.46

Background Coronary artery ectasia (CAE) is a common coronary artery disorder associated with adverse outcome but with determined pathophysiology. In the present study we sought to examine the systemic chronic inflammatory response that might associate CAE with respect to normal.
Methods Plasma samples from 16 patients with coronary artery ectasia (median age 64.9 ± 7.3 years, 12 male) and 71 matched controls (64.8 ± 8.6 years, 31 males) with normal coronary arteries. Samples were analysed at Umea university Biochemistry Laboratory, Sweden, using the V-PLEX Proinflammatory Panel 1 (human) Kit. Statistically significant differences ($p<0.05$) between patients and controls were determined using Mann-Whitney U-tests.
Results The CAE patients had significantly higher systemic levels of INF and TNF IL-1 and IL-8 ($p = 0.007$, 0.01, 0.001 and 0.002 respectively), while the levels of IL-2 and IL-4 were lower ($P < 0.001$ for both). The systemic levels of IL-10, IL-12 p and IL-13 did not differ significantly between patients and controls. None of these markers was significantly different between patients with Pure (n=6) and mixed (n=10) CAE with minimal atherosclerosis.
Conclusion These results indicate an enhanced systemic pro-inflammatory response in CAE, irrespective of additional atherosclerosis. The profile of this response indicates activation of macrophages, as well as possible involvement of a viral factor. The raised IL-8 levels may suggest additional evidence for angiogenesis.

47 NOVEL INFLAMMATORY BIOMARKERS OF CORONARY PLAQUE INSTABILITY AND RUPTURE

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10.1136/heartjnl-2017-ICS17.47

Background Plaque inflammation precipitates rupture the sequel of which is coronary thrombosis and myocardial cell death. A panel of inflammatory biomarkers to detect plaque instability may increase diagnostic accuracy in chest pain patients. Interleukin 15 receptor alpha (IL-15 Rα) a receptor for interleukin 15, which modulates T cell proliferation and Galectin -3 (Gal-3) a lectin that is upregulated when monocytes differentiate into macrophages, are both intrinsically involved in plaque maturation and rupture. We aimed to determine their utility in detecting plaque rupture and instability.
Methods Consecutive patients presenting with chest pain to the emergency department of St James's Hospital, Dublin or those referred directly for angiography were recruited between September 2014 to December 2015. Patients were divided into non-cardiac chest pain (NCCP), stable angina (SA) and acute coronary syndrome (ACS-unstable angina, NSTEMI and STEMI) based on clinical presentation, chest pain scoring tools (HEART, TIMI and GRACE score), electrocardiogram (ECG) changes, troponin measurements and angiographic data. Serum concentration of Gal-3 (0.3–10 ng/ml) and IL-15 Rα (31.25–2000 pg/ml) was determined by ELISA (*R and D Systems Inc)*.
Results Patients (n=184), with NCCP (n=83), SA (n=51) and ACS (n=50) were recruited. The mean age for the entire cohort was 61± 12 years with 65% males. The mean concentration of IL-15 Rα was 728± 74 pg/ml in ACS patients, 629 ±76 pg/ml in SA and 515± 54 pg/ml in NCCP ($p= 0.05$). The mean Gal-3 concentration was 9.8± 2.6 ng/ml in ACS, 9 ± 2.3 ng/ml in SA and NCCP was 8.4± 0.3 ng/ml ($p = 0.02$). Both Gal-3 and IL-15 Rα were highest in patients with ACS. In patients with UA who were troponin negative and less likely to have undergone plaque rupture the mean Gal- 3 concentration was 9.9 ± 2.9 ng/ml ($p= 0.03$) and for IL-15 Rα it was 819± 608 pg/ml ($p=0.04$) which was significantly higher than those with NCCP and SA. In patients presenting with ACS the correlation between IL-15 Rα and Gal-3 was $r= 0.5$ ($p=0.02$). The correlation in UA was stronger with $r=0.6$ ($p=0.02$).
Conclusion In patients with ACS both IL-15 Rα and Gal-3 were significantly elevated when compared to those with NCCP and SA. In patients with UA who were troponin negative and likely presented with unstable plaque, IL-15 Rα and Gal-3 were significantly elevated with a high degree of correlation. Both markers may indicate plaque instability.

48 EFFECTIVE ATRIAL CONDUCTING SIZE DOES NOT PREDICT HUMAN AF VULNERABILITY

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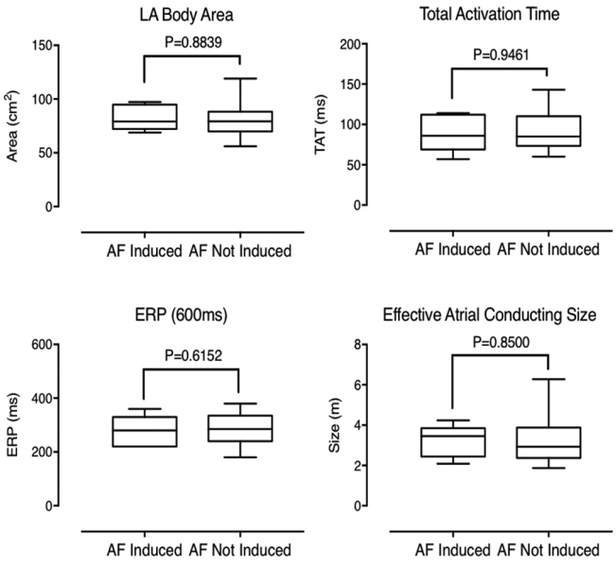
10.1136/heartjnl-2017-ICS17.48

Background The multiple wavelet hypothesis is an established theory to explain initiation and maintenance of atrial fibrillation (AF).
Purpose We hypothesised that if the multiple wavelet hypothesis is valid for human AF, the ability of a chamber to support AF would be proportional to the Effective Atrial Conducting Size, a function of total area, conduction velocity and atrial refractoriness.
Methods High density activation mapping (CS pacing) followed by complete wide area encirclement was performed in 27 patients (19 paroxysmal, 8 persistent) undergoing 1st time ablation. The following parameters were measured: (1) LA body area [A], was measured using Carto3; (2) Refractoriness [ERP] was measured at the posterior wall; (3) Total activation time [TAT] was measured from earliest to latest LA activation; (4) Conduction velocity [CV] was defined as sqrt(A)/TAT. Effective Atrial Conducting Size was calculated as A/(CV*ERP). A rigorous AF induction protocol consisting sensed doubles, sensed triples and incremental atrial pacing was applied. Sustained AF was defined as AF >30 s duration.
Results Sustained AF was induced in 7 (26%) patients. Individually there were no differences in LA area, TAT, CV or ERP

between patients with and without AF induction (all P>0.05, Figure 1). Effective Atrial Conducting Size was 3.2±0.8 m in patients in whom AF was induced, and 3.2 ±1.1 m in patients in whom AF was not induced (P=0.85).

Conclusion Effective Atrial Conducting Size was not associated with the ability to induce AF. These data suggest that multiple wavelets are unlikely to constitute the dominant mechanism of AF in these patients.



Abstract 48 Figure 1 Measured and calculated study parameters

49 PREVALENCE AND PREDICTORS OF QTC PROLONGATION IN ACUTE MEDICAL ADMISSIONS

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10.1136/heartjnl-2017-ICS17.49

Introduction An ECG is commonly performed at the point of medical admission. Amongst the myriad of information provided by an ECG, the QT interval is often overlooked and is a risk factor for ventricular arrhythmias. We sought to determine the prevalence of QTc prolongation amongst patients admitted to hospital on acute medical take and to determine if there was a relationship between this, electrolyte abnormalities and drugs known to prolong the QT.

Methods Prospective observational study, analysing the clinical notes of >100 consecutive patients admitted to our centre. The primary outcome to be assessed was the prevalence of a prolonged QTc.

Secondary outcomes were: (1) Degree of QTc prolongation (2) Presence of QTc prolonging medications on admission (3) Initiation of QTc prolonging medications after admission (4) Presence of Electrolyte abnormalities associated with QTc prolongation Chi squared test was used to compare categorical data. Students t test was used to compare means between groups.

Results 26% of all patients admitted had a QTc above the traditional normal range of 440 ms. 14% of patients had a QTc in the practically prolonged category as per AHA guidelines (>450 ms for men, >460 ms for women) and 2% of patients had a QTc in the very prolonged range (>500 ms). No patients had documentation of their QTc in their medical admission note, despite our pro-forma medical admission note template having a section specifically for ECG findings. Nearly half of all admitted patients (47%) were taking at least one medication known to prolong the QTc prior to their admission. 29.78% of these patients were then prescribed a further medication known to prolong the QT interval. 8 of these patients had a QTc >460 ms. A higher proportion of patients with QTc >440 ms were on drugs known to prolong the QTc than patients with normal QTc but this did not reach statistical significance (61.5% vs 42.5%, p=0.0945). Overall, 24% of all admitted patients were started on at least one medication associated with prolongation of the QTc. Of the patients with prolonged QTc at baseline, 34.6% were started on a medication known to prolong the QTc. Electrolyte abnormalities associated with QTc prolongation were also measured in our cohort. Of these only serum K+ was found to be statistically significantly lower in the prolonged QTc group (Mean 3.28 mmol/L vs. 3.98 mmol/L, p=0.0077). Serum Magnesium (p=0.1193) or Calcium (p=0.1443) levels were numerically but not statistically significantly lower in the prolonged QTc group.

Conclusion(s) QTc prolongation is common amongst acute medical admissions in the Irish setting. A high proportion of medical admissions are already on medications known to prolong the QTc. We would recommend screening for QTc prolongation in all patients admitted on medical take.

50 MACROSCOPIC AND MICROSCOPIC ANALYSIS OF THE LEFT ATRIAL APPENDAGE WITH A VIEW TO A NOVEL ABLATION STRATEGY FOR ATRIAL FIBRILLATION

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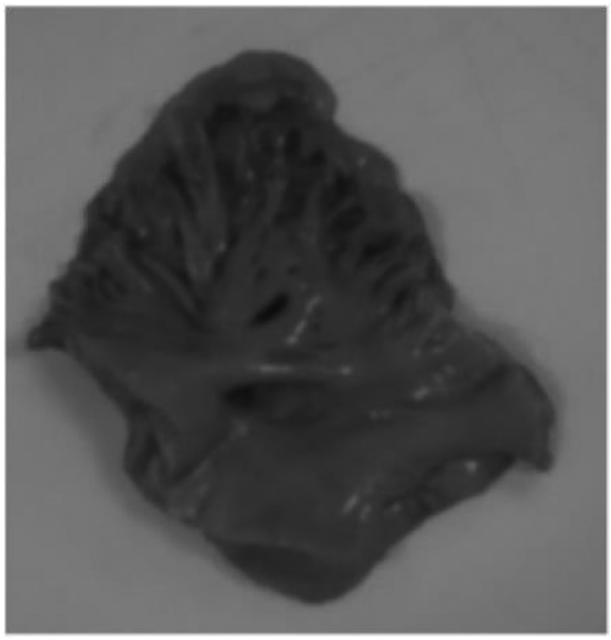
10.1136/heartjnl-2017-ICS17.50

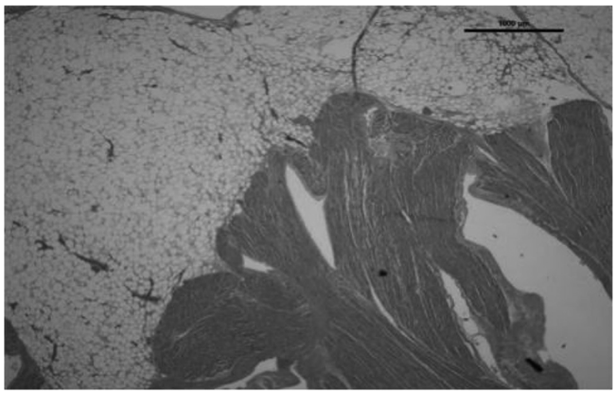
Introduction The left atrial appendage (LAA) has a key role in the formation of thrombus and subsequent embolic complications in atrial fibrillation (AF). It has been studied extensively, from recent interest in the various morphologies of the LAA and relative risk of thrombus to LAA occlusion and LAA ablation.

Methods/Results Eleven post-mortem LAA samples were collected for visual analysis, two were not included due to poor sample quality. On examination of the nine remaining samples, several common patterns of pectinate muscle orientation were noted. The LAA samples were noted to have a smooth circumferential neck of muscular tissue giving rise to a dominant singular smooth trunk of papillary muscle in 7 cases and two trunks in 2 cases. These trunks were either shallow (5 samples) or more muscular and raised (4 samples) (Figure 1). Shallow trunks tended to be wider than the raised trunks and may even be circumferential (2 samples). The main trunk arborised to give off papillary muscle branches down to third or fourth order branches. The samples were visually assessed for the percentage of smooth papillary muscle versus non-papillary recesses and were found to have 50% smooth muscle in 3 samples, 50–75% in 3 samples and >75% in 3 samples. We performed histological analysis of further LAA samples collected during cardiac surgery in a parallel study. We identified a distint pattern of myocyte orientation from the neck, mid-section and apical section of the LAA. The neck of the



Abstract 50 Figure 1 Sample with single raised trunk dividing early into second order branches, 50% smooth papillary muscle

LAA had dense circumferential orientation of the myocytes. In the mid-section, arborisation of the papillary muscles can be appreciated with fibrous separation between myocyte bundles. Finally, in the apical segment of the LAA, myocytes can be seen reaching the epithelial surface in discrete bundles with very little communication between each bundle, often limited to one or two individual myocytes (Figure 2).



Abstract 50 Figure 2 Histological sample of LAA apex showing myocyte bundles reaching the epithelial surface with minimal communication between bundles

Conclusions/Implications We have identified via the examination of a small number of LAA's a common pattern of macroscopic papillary muscle orientation. Histological analysis of further samples has shown arborisation of myocyte fibres with minimal communication in distal segments of the LAA. We hypothesize that this information could be used to include a specific LAA ablation strategy for persistent AF. If the ostium of the LAA was ablated in a near-circumferential pattern leaving only a small gap in line with the predominant myocardial trunk that this could organize LAA activity with potential amelioration of its roles in the maintenance of persistent AF and in thrombostasis.

51 DOES DEGREE OF LOW AMPLITUDE ATRIAL VOLTAGE CORRELATE WITH POOR LEFT ATRIAL FUNCTION IN ATRIAL FIBRILLATION?

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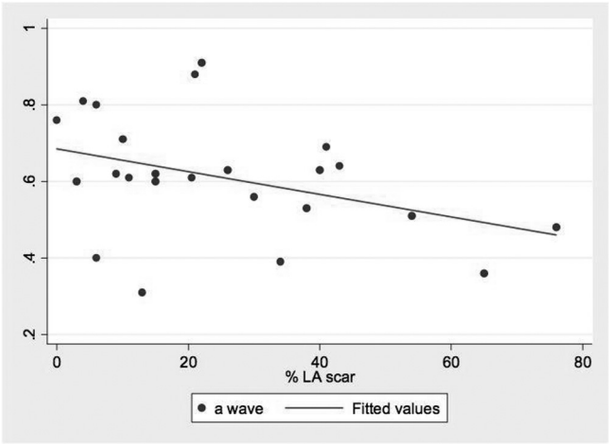
10.1136/heartjnl-2017-ICS17.51

Background Patients with atrial fibrillation (AF) frequently have atrial scarring characterised by discrete regions of low voltage. Pre-existing left atrial scarring is an independent predictor of pulmonary vein isolation (PVI) failure. Novel mapping algorithms have also been developed to assess the degree of atrial fibrosis. This may be expressed as a percentage of the total left atrial (LA) volume mapped. In addition to the electrical remodelling seen, structural remodelling occurs, with dilatation and reduced function. The most accurate determinant of LA function is debated, but the most frequently used method is transmitral A Wave velocity on pulsed-wave Doppler. The relationship between LA function and electrical changes seen in AF has not been defined.

Methods This was a single centre observational study. Left atrial voltage maps were created in patients undergoing PVI for the first time in the Mater Private Hospital between August 2016 and April 2017. LA voltage maps were initially created with a Lasso catheter with some further points taken with a Smarttouch ablation catheter (both Biosense Webster, Diamond Bar, California). Voltage greater than 0.5 mV was accepted as normal tissue and voltages < 0.2 mV scar. After creation of the voltage maps, the percentage scar was assessed using a novel computer algorithm (Biosense Webster). Pre-ablation echocardiograms were studied and the LA function was assessed by measuring the trans-mitral pulse wave Doppler. Assessments were only made in sinus rhythm.

Results Out of 96 patients who had undergone PVI, only 24 were found to have had sinus rhythm on pre-procedural echo. The mean age was 63.5 (standard deviation or SD 10.6) years. 66% of the group were men. 58% had paroxysmal AF. The mean amplitude of the A-wave in the study was 0.61 (SD 0.16) ms^{-1}. An average of 1269.7 (SD 857.0) mapping points were taken. The mean LA percentage scar was 25.1 (SD 20.3) %. Using linear regression, adjusted for age at time of procedure, there was a significant negative association between a wave (in ms^{-1}) and % LA scar (Beta coefficient -72.44, 95% CI -122.99 to -21.88, p=0.007). Using pairwise correlation, the correlation coefficient between LA scar and A wave was -0.38, p=0.06.



Abstract 51 Figure 1 Two-way scatterplot with fitted regression line between left atrial scar and transmitral A wave velocity. A wave measure in ms^{-1}, LA scar expressed as a percentage

Conclusion Our study found an inverse correlation between transmitral A wave and degree of left atrial scarring when LA function was adjusted for patient age, indicating that LA electrical remodelling as measure by percentage scar is associated with decreased LA function in patients with AF. However, there were only 24 patients in this study and ongoing research with more patients is warranted to further substantiate this.

52 PREVALENCE OF CORONARY ARTERY CALCIFICATION IN PATIENTS WITH EARLY STAGE LUNG CANCER AND MISSED OPPORTUNITIES FOR CARDIOVASCULAR RISK OPTIMIZATION

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10.1136/heartjnl-2017-ICS17.52

Introduction Cardiovascular (CV) disease is a leading cause of morbidity and mortality in cancer survivors. Patients with lung cancer often have traditional CVD risk factors.Quantification of coronary artery calcium (CAC) on gated noncontrast cardiac CT, as a screening test for subclinical coronary artery disease, is a proven tool for the prediction of long-term cardiovascular risk. CAC may also be incidentally identified on noncontrast non-gated chest CT imaging (NCCT) performed during evaluation of patients with lung cancer. This presents an opportunity to modify CV risk in this cancer cohort.

Aims To determine the prevalence of CAC among patients with a new diagnosis of early stage non-small cell lung cancer (NSCLC)

To investigate if the incidental finding of CAC in patients with NSCLC who were not on the combination of aspirin (ASA) and statin prompted initiation of these agents at any time within the following 6 months.

Methods We carried out a single center, retrospective cohort study of 143 patients referred to thoracic surgery with early stage NSCLC who had undergone noncontrast CT chest imaging prior to surgery. Baseline demographics, cardiovascular risk factors, oncological history, as well as usage of anti-platelet and lipid lowering agents, were determined from review of electronic medical record review. All NCCTs were independently reviewed by two readers with training in advanced CV imaging using validated techniques to identify and grade severity of CAC. Medications usage at 6 months following NCCT was assessed to determine if the incidental finding of CAC in patients without pre-existing diagnoses of coronary artery disease (CAD), peripheral arterial disease (PAD), or cerebrovascular disease (CVD), prompted prescription of anti-platelet and lipid lowering agents. Data on absolute and relative contraindications to prescription of these agents, and on any new CV events in this intervening period were also sought.

Results Of the 143 patients included in this study, the mean age was 67 years (range 41–88), and 42% were male. Image quality was adequate to evaluate for CAC in 138 (96.5%) of patients. CAC was detected in 109 (79%) patients; 68 of these patients had no pre-existing diagnosis of CAD, PAD, or CVD. Of these 68 patients, 37 were on ASA, a statin or both at baseline. At 6 months following the incidental finding of CAC on NCCT, only 3 additional patients had been commenced on ASA and none on a statin.

Conclusion CAC is a very prevalent finding on NCCT chest imaging performed in patients with early stage lung cancer, but does not prompt prescription of antiplatelet and/or lipid lower agents in the majority of cases. The finding of subclinical coronary atherosclerosis during staging NCCT chest imaging presents an opportunity for interventions that could improve cardiovascular outcomes in this cohort of cancer patients.

53 FAST NOT ALWAYS BETTER – DIABETIC SCREENING AT TIME OF STEMI

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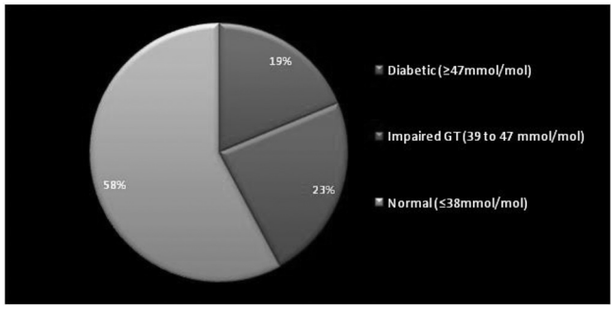
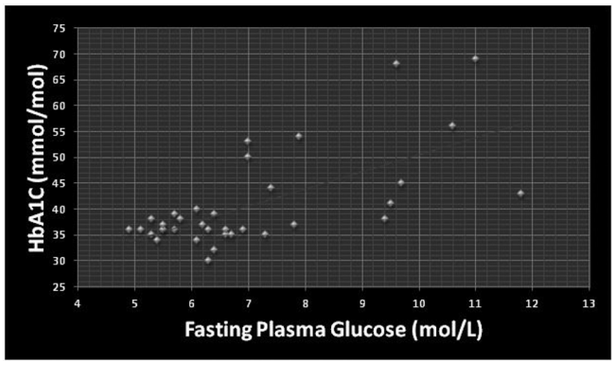
10.1136/heartjnl-2017-ICS17.53

Introduction The European Society of Cardiology recommends that all patients with coronary artery disease should have their glycaemic state evaluated to enable risk stratification and optimal management. The World Health Organisation and American Diabetes Association agree on diagnostic criteria, and allow the use of Fasting Plasma Glucose, Two-hour plasma glucose challenge or HbA1 c to establish a diagnosis of Diabetes [1]. The purpose of this study was to assess how random and fasting plasma glucose tests compare to HbA1 c as a diagnostic tool during the acute phase of an ST elevation MI.



Abstract 53 Figure 1 HbA1 C results during STEMI Abstract 53



Abstract 53 Figure 2 Relationship between HbA1 C and fasting glucose

Methods We reviewed all patients admitted to a tertiary referral centre with HIPE coded diagnosis of ST elevation myocardial infarction from 1st January to December 31st 2016. Their blood glucose and HbA1 c results during their inpatient stay were analysed and the Pearson correlation coefficient of fasting glucose and HbA1 c was calculated to assess their relationship.

Results Of 164 patients included for analysis, 135 had their glycaemic state evaluated (82%), a further 20 patients (12%) were repatriated to a local hospital prior to glycaemic testing. The most common test was fasting plasma glucose (49%), followed by Hba1 C (39%) and random glucose (38%). 37 of the 64 HbA1 c tests (58%) returned a normal result (≤38 mmol/mol). Within the cohort of patients with a normal HbA1 c, 41% had an abnormal fasting or random plasma levels. 4/15 (27%) of the pre-diabetic HbA1 c results were preceded by normal fasting or random glucose levels. The Pearson correlation coefficient between Fasting plasma glucose and HbA1 c was 0.66, indicating a moderate correlation. 19/164 patients (12%) had a pre-existing diagnosis of diabetes mellitus. A new diagnosis of Diabetes Mellitus was confirmed by HBa1 c testing (≥48 mmol/mol) in 4 patients (2.8%), and a pre-diabetic state (39 to 47 mmol/mol) was diagnosed in 14 patients (9.7%) without a previous diagnosis.

Conclusions There is a significant under diagnosis of Diabetes Mellitus in patients presenting with STEMI. Routine glycaemic testing can identify previously undiagnosed patients. Our study shows a moderate correlation between fasting plasma glucose and HbA1 c. Plasma glucose levels are severely affected during the acute inflammatory response associated with STEMI,[1] and therefore HbA1 c represents an alternative for accurate assessment of glycaemic state. Routine use of HbA1 c testing on patients with STEMI will help diagnose new diabetics, assess glycaemic control in patients with a pre-existing diagnosis, and identify those patients who are in a pre-diabetic state.[2]

54 THE NLRP3 INFLAMMASOME AND OTHER RELATED RECEPTORS AS POTENTIAL BIOMARKERS IN CORONARY ARTERY DISEASE (CAD) AND MAJOR ADVERSE CARDIAC EVENTS (MACE)

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10.1136/heartjnl-2017-ICS17.54

Introduction Coronary artery disease (CAD) is the leading cause of death worldwide caused by atherosclerosis, now believed to be a complex inflammatory process. Mounting data indicates that the Nucleotide-binding domain, leucine-rich containing family, pyrin domain-containing-3 (NRLP3) inflammasome is critical in the pathogenesis and/or regulation of a variety of inflammatory diseases including atherosclerosis. NLRP3 is a multiprotein complex responsible for the activation of capase-1 and proteases required for processing and activating IL-1 b and IL-18. Previous evidence suggests that NLRP3 is activated and regulated by the cannabinoid receptor type 1 (CB1 r) and scavenger receptor, cell surface cluster of differentiation 36 (CD36 r) in response to modified lipoproteins through amplification of inflammation or exposure to oxidised low-density lipoproteins (oxLDL). CB1 r and CD36 r are therefore considered risk factors for atherosclerosis, in the promotion of cholesterol accumulation and release of inflammatory mediators. To date, no study has investigated NLRP3, CD36 r and CB1 r collectively as a potential panel of biomarkers to predict major adverse cardiovascular events (MACE).

Purpose To measure the expression of the NLRP3 inflammasome and associated receptors (CD36 r and CB1 r) and to determine if levels correlate with cardiovascular risk.

Methods Consecutive patients were recruited from the cardiac catheterisation laboratory and outpatient clinics. Group 1 were defined as Very high risk patients (VHR) with a 10-year risk SCORE ≥10% risk of fatal CVD. VHR patients were subdivided in Acute Coronary Syndrome patients (ACS-VHR) and elective percutaneous coronary intervention patients (ELEC-VHR). Group 2 were low risk patients (LR) with a 10-year risk SCORE <1% risk of fatal CVD. Proteins were extracted from a buffy coat preparation using the Mammalian Protein Extraction Reagent (M-PER) and then analysed by western blot. RNA was extracted from the buffy coat and analysed by real time PCR.

Results A total of 60 patients were recruited and the cohort consisted of VHR (n=40), which were divided into ACS-VHR (n=20) and ELEC-VHR (n=20), and LR (n=20). NLRP3 gene expression was higher in VHR compared to LR (0.0284 ± 0.0013 vs. 0.0142 ± 0.0019, $p<0.0001$). NLRP3 protein levels were also higher in VHR compared to LR ($p<0.05$). NLRP3 gene and protein levels were particularly higher in

ACS-VHR compared to LR ($p<0.05$). CB1 r protein levels were higher in VHR compared to LR ($p<0.01$). CD36 R gene expression was not significantly between VHR and LR, however protein levels were significantly different.

Conclusion These results indicate that NLRP3 and CB1 r can potentially differentiate between VHR and LR patients. An ongoing larger cohort study is underway to investigate the utility of NLRP3, CD36 r and CB1 r along with other promising biomarkers to better predict CAD and MACE.

55 QUALITY OF LIFE IS SIMILAR IN PATIENTS WITH CHRONIC STABLE HEART FAILURE ON EITHER VASODILATING OR NON-VASODILATING BETA BLOCKERS. MODIFIED KANSAS CITY CARDIOMYOPATHY QUESTIONNAIRE

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10.1136/heartjnl-2017-ICS17.55

Background Beta-blockers with additional nitric oxide-mediated vasodilating properties are beneficial in patients with heart failure but its unknown if they are better than non-vasodilating Beta blockers.

Aim To compare quality of life in patients with chronic heart failure stabilised on vasodilating and non-vasodilating beta-blockers.

Methods and Results 163 patients having chronic stable heart failure for at least 6 months were evaluated according to their treatment with vasodilating or non-vasodilating betablockers. Modified Kansa city cardiomyopathy score was used to assess quality of life. Table 1 summarises patient characteristics, comorbidities and parameters of quality of life in both groups.

Abstract 55 Table 1 Patient characteristics, comorbidities and parameters of quality of life

	N=163		
Groups	Non-vasodilating Beta-blockers (n=132)	Vasodilating Beta-blockers (n=31)	P value
Gender n,(%)}	Male : 99 (75.3%)	18 (58.7%)	0.051
Age (yrs)	66.7±12.2	67.0±13.2	ns
Left ventricle EF (%)	39.9±12.2	39.7±11.3	ns
LVIDd(cm)	6.4±1.0	6.2±1.1	ns
Haemoglobin (g/dL)	13.1±1.6	13.0±1.5	ns
eGFR (ml/min	58.6±18.0	54.7±19.2	ns
Anti-proBnp	1243±1812	1692±2253	ns
Heart rate	71.0±14.7	69.8±15.27	ns
Comorbidities	n (%)	n (%)	
Ischaemic cardiomyopathy	58 (43.4)	12 (38.7)	ns
Diabetes	25 (18.6)	5 (16.1)	ns
Renal disease	55 (41.7)	17 (51.9)	ns
Hypertension	75(56.8)	17(56.8)	ns
COPD	16(12.1)	6 (19.4)	ns
Smokers	7 (9.2)	11(12.6)	ns
Ex-smoker	46 (60.5)	43(49.4)	ns
Treatment			
ACE inhibitors	122(92.4)	31(100)	ns
Calcium blockers	17 (12.9)	2 (6.5)	ns
MR antagonists	91 (68.9)	24 (77.3)	ns
Devices	12 (9.1)	3 (9.7)	ns
KCCQ -7 score			
Physical limitation	69.7±22.2	67.6±32.1	ns
Symptom stability	54.3±17.4	54.8±18.6	ns
Symptom frequency	75.5±17.4	74.6±24.6	ns
Symptom Burden	77.5±23.2	77.1±25.4	ns
Symptom Total score	76.9±23.2	74.6±26.5	ns
Self-efficacy	78.2±23.8	75.9±30.0	ns
Quality of life	66.8±27.0	64.7±26.7	ns
Social limitation	66.7±29.6	66.6± 29.7	ns
Overall summary	70.222.6	68.425.7	ns
Clinical summary	73.4±23.1	72.2±22.6	ns

Conclusion There was no difference in the quality of life of patients on vasodilating and non-vasodilating beta-blockers. While vasodilation should improve quality of life, the lack of difference in our study may reflect that patients may already have maximal vasodilation due to their other therapeutic agents such as ACE or ARBs. This indicates that beta blocker choice is not essential in otherwise optimally treated patients.

Brian Maurer Young Investigator Award

56 THE INFERIOR VENA CAVA – A REPRODUCIBLE AND CLINICALLY USEFUL TOOL IN THE MONITORING AND TREATMENT OF HEART FAILURE WHICH DESERVES GREATER CLINICAL PROMINENCE

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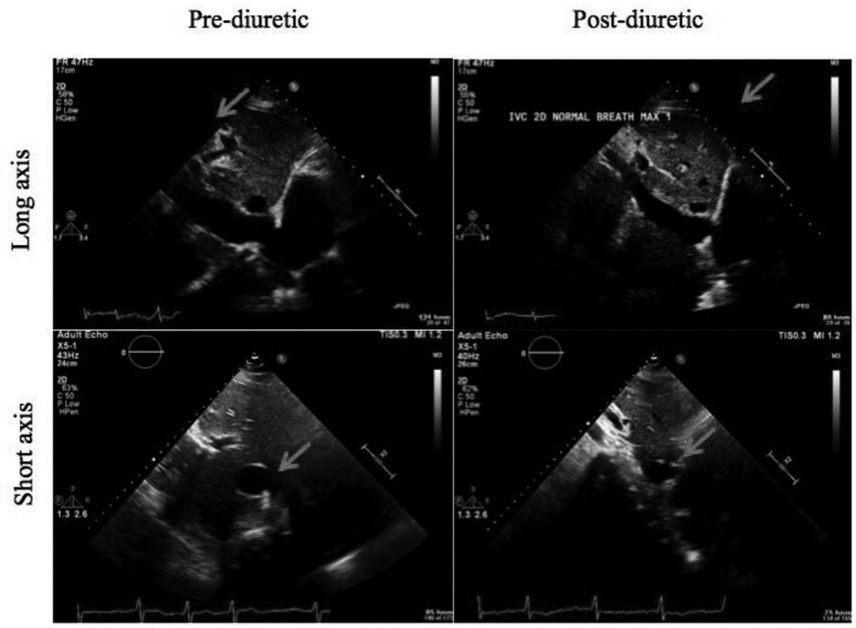
10.1136/heartjnl-2017-ICS17.56

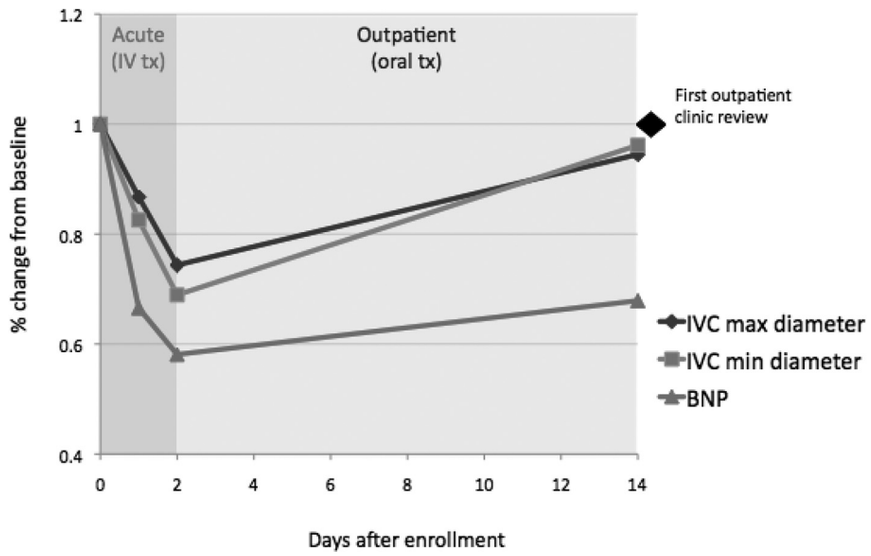
Background/Introduction Heart Failure (HF) management has advanced, however hospitalisation rates and mortality remain high. Maintaining euvolaemia is key to preventing decompensation but can be challenging. The Inferior Vena Cava (IVC) is a pliable reservoir for circulating volume, and changes in its shape during respiratory cycles are recognized as markers of intravascular volume status, albeit not routinely used in HF management.

Purpose To assess the reproducibility and test the clinical utility of using the IVC as a marker of volume status in a chronic HF population as well as to track change in IVC metrics in response to volume removal.

Methods This was a multicentre study conducted between St. Vincent's University Hospital (SVUH) and St. Michael's Hospital (SMH) in Dublin. Stable outpatients were enrolled in prospective fashion during routine scheduled heart failure visits to SMH. Reproducibility was measured by three repeated measurements of maximal IVC diameter (IVCd) and collapsibility index (CI) at 0, 1 and 24 hours. Recompensating HF patients were enrolled prospectively from attendances to SVUH emergency department with acute decompensated heart failure. IVC metrics after admission were followed daily for 48 hours



Abstract 56 Figure 1



Abstract 56 Figure 2

and then at 14 days post-admission. Dialysis patients were enrolled from patients undergoing intermittent haemodialysis in SVUH for stable chronic kidney disease. IVC metrics were measured at commencement, midpoint and end of dialysis. Data collected were correlated with markers of volume overload including natriuretic peptide (BNP).

Results A total of 60 patients were included, 40 in the stable cohort and 10 each in the dialysis and recompensating arms. Serial IVC measurements over 24 hours showed good reproducibility, with an average standard deviation around the mean of 1.3 mm for IVCd and 7% for CI. When examining the stable cohort, patients with a dilated or poorly collapsible IVC had a significantly higher N-terminal pro B-type NP (3682 pg/mL vs 490 pg/mL, p=0.015) and poorer glomerular filtration rate (55 ml/kg/min vs 69 ml/kg/min p=0.029). Patients in the dialysis arm had an overall IVCd reduction of >30% over the course of their treatment which correlated with a 15% rise in haematocrit. Patients in the recompensating arm experienced a 30% reduction in IVCd during inpatient treatment over 48 hours. This subsequently rose after discharge back to similar size as their IVCd at enrollment, potentially reflecting the fact that the first month post-discharge is where rehospitalisation rates are highest.

Conclusion(s) Measurement of IVC metrics appears to reflect volume status as well as matching fluid shifts in response to dialysis and diuretics. Use of the IVC to more precisely maintain euvolaemia in volume-dependent patients may deserve greater attention as a therapeutic target.

Abstract 56 Table 1

	Normal IVCd andIVCCI	High IVCd or low IVCCI	*p* value
E/e'	13	19	0.02
NTpro BNP (pg/mL)	3682	490	0.015
BNP (pg/mL)	652	329	0.013
eGFR (mL/kg/1.73 m^2)	55	69	0.029

57 THE EFFECT OF REMOTE ISCHEMIC CONDITIONING AND GLYCERYL TRINITRATE ON PERIOPERATIVE MYOCARDIAL INJURY IN CARDIAC BYPASS SURGERY PATIENTS: THE ERIC-GTN STUDY

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10.1136/heartjnl-2017-ICS17.57

Introduction Remote Ischaemic Conditioning (RIC) using transient limb ischemia/reperfusion has been reported to reduce perioperative myocardial injury (PMI) in patients undergoing coronary artery bypass grafting (CABG) and/or valve surgery. The role of intravenous Glyceryl Trinitrate (GTN) therapy administered during cardiac surgery as a cardioprotective agent and whether it interferes with RIC cardioprotection is not clear and is investigated in the ERIC-GTN trial (Clinicaltrial.govidentifier: NCT01864252).

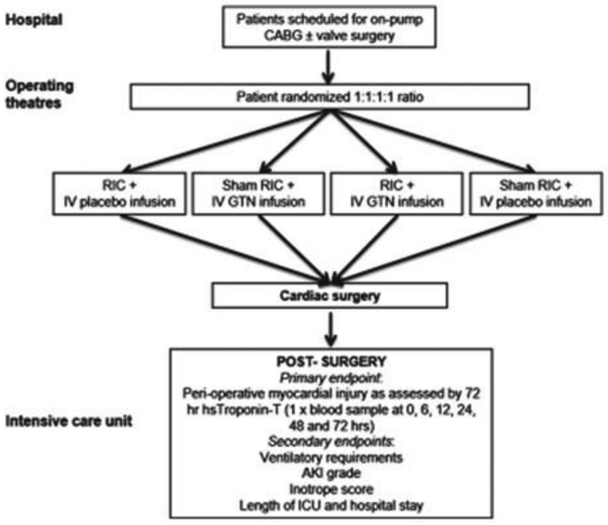
Aims The ERIC-GTN trial has been designed to determine whether intraoperatively administered IV GTN is cardioprotective during cardiac surgery and to investigate the interaction between RIC and IV GTN in their cardioprotective effects.

Hypothesis 1: Intra-operative intravenous GTN will reduce PMI in patients undergoing CABG and/or valve surgery.

Hypothesis 2: RIC will reduce PMI in the absence of GTN in patients undergoing CABG and/or valve surgery.

Hypothesis 3: RIC will not reduce PMI in the presence of GTN in patients undergoing CABG and/or valve surgery.

Design The ERIC-GTN trial is a single site, double-blind, randomised placebo-controlled study. Consenting adult patients (>18 years) undergoing elective CABG ±valve surgery with blood cardioplegia will be eligible for inclusion. 260 patients will be randomised to one of four treatment groups following aesthetic induction: (1) **RIC alone**: RIC protocol comprising three 5-minutes cycles of simultaneous upper arm and thigh cuff inflation/deflation followed by an intravenous (IV) placebo infusion; (2) **GTN alone**: A simulated sham RIC protocol will be applied followed by an IV GTN infusion; (3) **RIC+GTN**: RIC protocol followed by IV GTN infusion; and (4) **Neither RIC or GTN**: Sham RIC protocol followed by IV placebo infusion. The primary endpoint will be peri-operative myocardial injury as quantified by the 72 hour area-under-the-curve (AUC) serum high sensitive Troponin-T.



Abstract 57 Figure 1

Implication The ERIC-GTN trial will determine whether intraoperative GTN therapy is cardioprotective during cardiac surgery, and whether it affects RIC cardioprotection. We recruited 180 out of 260 patients so far and are currently undertaking a pre-specified interim analysis.

58 NOT AVAILABLE FOR PUBLICATION

59 SUBCLINICAL DIASTOLIC DYSFUNCTION IS PREVALENT IN DIABETES, PROGRESSES OVER TIME AND MAY REFLECT A HANDICAP IN NATRIURETIC PEPTIDE FUNCTION

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10.1136/heartjnl-2017-ICS17.58

Purpose Left ventricular diastolic dysfunction (LVDD) is a prevalent feature of cardiomyopathy in diabetes. It is also a significant predictor of cardiovascular disease in general at risk populations. B- type Natriuretic Peptide (BNP) is a well established marker of diastolic function in the general population but emerging data indicate a natriuretic peptide (NP) handicap in diabetic patients which may compromise its use in this population. Therefore we aim to describe the prevalence, progression and importance of LVDD in diabetes and determine the accuracy of NP in predicting LVDD and its progression.

Methods Patients enrolled in the STOP-HF service between Jan 2011 and Dec 2013 with diabetes were included and compared with a non-diabetic cohort. Using transthoracic echocardiography (TTE), we measured LAVI in addition to

standard Doppler-echocardiographic parameters (including E/E' and left ventricular mass index (LVMI)). TTE was performed at baseline and at a predefined follow up visit (2 to 5 years post baseline). A significant increase in LAVI (LAVI progression) was defined as a change of > 3.5 ml/m^2. BNP was measured at baseline and follow up visits. Hospitalisation for major adverse cardiovascular events (MACE) was identified from hospital discharges at least 2 years after the baseline visit. Multivariable-adjusted logistic regression was used to identify factors associated with LAVI progression and hospitalisation for MACE.

Results There were 1238 patients enrolled in the service. Four hundred and forty seven (36.1%) of these were diabetic (mean age 64.7 years). The mean LAVI was 26.1 ml/m^2 in the diabetic group and 26.8 ml/m^2 in the non diabetic group (p = 0.5). LAVI progression was similar in both groups (31.6% DM vs 29.4% non DM, p = 0.44). Use of RAAS modifying therapy was higher in the diabetic group (56.3% vs 43.1%, p < 0.001). MACE occurred in 7.2% of the diabetic population and 3.2% of the non diabetic population (p = 0.001). MACE occurred in 6.4% of those with LAVI progression and in 3.7% of those without LAVI progression (p = 0.047). Baseline BNP was predictive of LAVI progression in the non diabetic group (OR 2.00, CI 1.04–3.86) but not in the diabetic group (OR 2.16, CI 0.86–5.42). Progression of BNP to an abnormal level at follow up was predictive of LAVI progression in the non diabetic group (OR 2.86, CI 1.62–5.07) but not in the diabetic group (OR 1.41, CI 0.64–3.09). Baseline BNP and progression of BNP to an abnormal level at follow up was predictive of MACE hospitalisation (OR 3.6, CI 1.54–8.41 and OR 3.93, CI 1.83–8.42 respectively). LAVI progression was associated with MACE on univariate analysis (OR 1.79, CI 1.00, 3.20) but not on multivariate analysis (OR 1.32, CI 0.71–2.44).

Conclusions Preclinical diastolic dysfunction is prevalent among diabetics, progresses over time in a significant proportion and is potentially linked to clinical events. While NP identified the non diabetic at risk group, it did not predict risk in the diabetic group suggesting a handicap in NP function. This leaves an opportunity to intervene in the natural history of diabetic cardiomyopathy by modulating the NP system.

Moderated poster session 3

60 UTILITY OF T WAVE AMPLITUDE AS A NON-INVASIVE RISK MARKER OF SUDDEN CARDIAC DEATH IN HYPERTROPHIC CARDIOMYOPATHY

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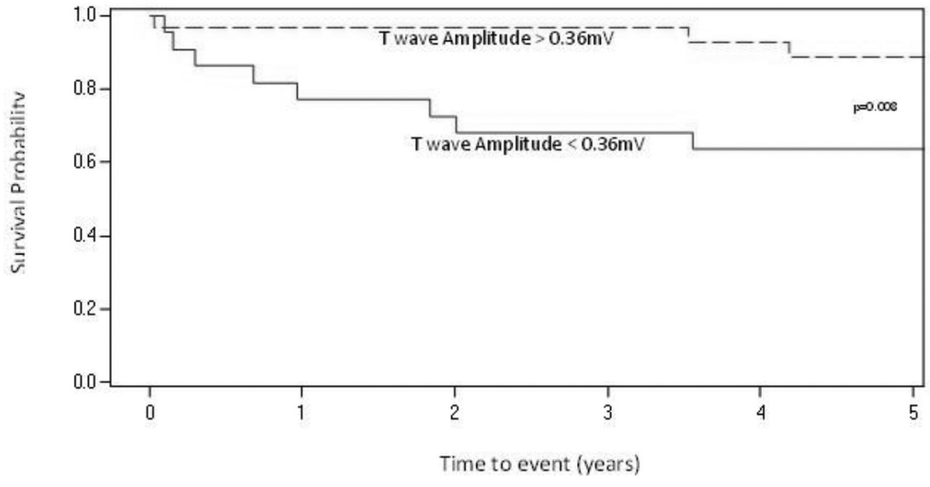
10.1136/heartjnl-2017-ICS17.59

Objective Sudden cardiac arrest (SCA) is the most devastating outcome in hypertrophic cardiomyopathy (HCM). Presently, risk stratification is imperfect and underscores the need to identify novel markers for malignant disease. We evaluated repolarization features on the surface electrocardiograms (ECG) to identify potential risk factors for SCA.

Methods Data was collected from 52 HCM patients who underwent implantable cardioverter defibrillator (ICD) implantation. Leads V2 and V5 from the ECG closest to the time of ICD implant were utilized for measuring the Tpeak-Tend interval (Tpe), QTc, Tpe/QTc, T-wave duration, and T-wave amplitude. The presence of the 5 traditional SCA-associated risk factors was assessed, as well as the HCM risk-SCD score.

Results 16 (30%) patients experienced aborted cardiac arrest over 8.5±4.1 years, with 9 receiving an ICD shock and 7 receiving ATP. On univariate analysis, T-wave amplitude was associated with appropriate ICD therapy (HR per 0.1 mV 0.79, 95% CI 0.56–0.96, p=0.02). Aborted SCA was not associated with a greater mean QTc duration, Tpeak-Tend interval, T-wave duration, or Tpe/QT ratio. Multivariate analysis (adjusting for cardinal HCM SCA-risk factors) showed T-wave amplitude in Lead V2 was an independent predictor of risk (adjusted HR per 0.1 mV 0.74, 95% CI 0.57–0.97, p =0.03). Addition of T-wave amplitude in Lead V2 to the traditional risk factors resulted in significant improvement in risk stratification (C-statistic from 0.65 to 0.75) but did not improve the performance of the HCM SCD-risk score.

Conclusion T-wave amplitude is a novel marker of SCA in this high risk HCM population and may provide incremental predictive value to established risk factors. Further work is



Abstract 60 Figure 1

needed to define the role of repolarization abnormalities in predicting SCA in HCM.

61 DIAGNOSING CONCEALED BRUGADA SYNDROME; A 5 YEAR INHERITED CARDIAC CENTRE REGISTRY

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10.1136/heartjnl-2017-ICS17.60

Brugada syndrome (BrS) is associated with increased risk of cardiac arrest due to ventricular fibrillation and remains an important cause of sudden arrhythmic death syndrome (SADS). BrS is recognised by phenotypic electrocardiographic (ECG) patterns alongside specific clinical risk factors. The type 1 BrS pattern may either be spontaneous or concealed. Ajmaline, a class 1 C Sodium channel antagonist, is used to unmask the concealed pattern seen in BrS. We, retrospectively, reviewed all 231 patients that underwent ajamline provocation between 2011 and 2016. 59 (26%) patients had a concealed type 1 BrS pattern after ajmaline provocation. 105 patients with a family history of BrS were screened, in whom 38(36%) had a concealed pattern. Within this group 6 families had a history of overlapping Long QT Syndrome (LQTS). 61 patients screened had a family history of SADS. 5(8%) of these patients had a positive response. A further 12 patients were screened due to potential arrhythmic symptoms alongside borderline type 2 or 3 BrS patterns. 16 patients were referred after an aborted cardiac arrest (ACA), with 3(19%) of these patients having concealed BrS pattern after ajmaline provocation. 15(30%) of the patients with concealed BrS had an identifiable SCN5 A variant after serological genetic analysis. An A-ICD was inserted in 5(9%) patients with concealed BrS including all 3 patients with prior ACA and one patient with non-sustained monomorphic ventricular tachycardia (VT) detected via an implantable loop recorder (ILR). These patients remain free from VT and device-led therapy at present. An ILR was inserted in 9(17%) patients to further risk stratify patients with on-going potential arrhythmic symptoms. On ILR interrogation, 2 patients had episodes of non-sustained VT. Electrophysiological studies (EPS) were performed for diagnostic purposes, alongside ajmaline provocation, in 4(6.8%) of the patients with concealed BrS. 2 EPS were entirely negative. Ventricular fibrillation (VF) was induced in one study, and this patient currently awaits A-ICD insertion. The remaining EPS were negative. No cardiac adverse events occurred during or after ajmaline infusion. One patient had documented evidence of temporary cholestatic jaundice post administration, a recognised but rarely reported complication. All 59 patients with BrS remain free from sustained ventricular arrhythmias, ACA and sudden cardiac death (SCD) at this time. In conclusion, ajmaline provocation is a safe and important diagnostic test for BrS. The ACA and ventricular arrhythmic event rate was low in our patient cohort. There was a 26% diagnostic yield in those patients referred as part of familial BrS screening, similar to that seen in other registries. The presence of a SCN5 A variant was seen in 30% of those with concealed BrS which is higher than previously published yields ~20–25%. 19% of patients with a history of unexplained ACA had concealed BrS which is higher than that seen in the CASPER registry.

62 GALECTIN-3 AS A MARKER OF UNSTABLE CORONARY PLAQUE

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10.1136/heartjnl-2017-ICS17.61

Introduction Galectin-3 (Gal-3) is a pleiotropic lectin that is upregulated when monocytes differentiate into macrophages. It plays an important role in cell proliferation, angiogenesis and apoptosis. We aimed to determine the utility of Gal-3 as a marker of coronary plaque rupture and unstable plaque.

Methods Consecutive patients presenting with chest pain to the emergency department of St James's Hospital, Dublin and those referred directly for angiography were enrolled between September 2014 to December 2015. Patients were divided into non-cardiac chest pain (NCCP), stable angina (SA) and acute coronary syndrome (ACS-unstable angina, NSTEMI and STEMI) based on clinical presentation, chest pain scoring tools (HEART, TIMI and GRACE score), electrocardiogram changes, troponin measurements and angiographic data. GENSINI and Syntax scores were used as measures of total plaque burden at angiography. Serum concentration of Gal-3 (0.3–10 ng/ml) was performed by ELISA (*R and D Systems Inc)*.

Results Patients (n=191), with NCCP (n=96), with SA (n=47) and with ACS (n=48) were enrolled. Mean age was 61± 11 years with 65% males. The mean concentration of Gal-3 in NCCP was 8.4± 0.3 ng/ml, 9 ± 2.3 ng/ml in SA and 9.8 ± 2.6 ng/ml in ACS (p =0.02). In patients with symptoms of chest pain within the preceding 12 hours (NCCP=50, SA= 27, ACS= 42) the mean concentration of Gal-3 was 10.1± 0.4 ng/ml for ACS, 9.1± 1.7 ng/ml in SA and 8.7± 0.3 ng/ml in NCCP (p = 0.01). In patients with UA who were troponin negative and less likely to have undergone plaque rupture, Gal-3 was significantly elevated compared to both NCCP and SA at 10± 1.8 ng/ml (p<0.001). Table 1 highlights the correlations between Gal-3 and ACS patients.

Abstract 62 Table 1 Correlation between Gal-3 and various markers in ACS patients

Variable	Pearsons Correlation Coefficient	p value
GRACE score	0.4	0.01
CRP	0.4	0.004
Creatinine	0.3	0.005
Hemoglobin	-0.3	0.004
HEART score	0.09	0.9
TIMI score	0.02	0.1
GENSINI score	0.08	0.3
Syntax score	0.001	0.9
Troponin	0.09	0.2

Conclusion Gal-3 was significantly elevated in ACS patients with plaque instability and rupture. In UA patients who were troponin negative and less likely to have undergone plaque rupture Gal-3 was significantly elevated. Gal-3 may be a marker of unstable coronary plaque where myocardial infarction has not occurred.

63 HYPOXIA INDUCES GENE-SPECIFIC EPIGENETIC MODIFICATIONS IN HUMAN CARDIAC FIBROBLASTS WHICH ARE ASSOCIATED WITH THE DEVELOPMENT OF MYOCARDIAL FIBROSIS

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10.1136/heartjnl-2017-ICS17.62

Introduction Ischemia caused by coronary artery disease and myocardial infarction leads to aberrant ventricular remodelling and cardiac fibrosis. This occurs partly through accumulation of gene expression changes in resident fibroblasts, resulting in an overactive fibrotic phenotype. We have recently shown that human myocardial tissue hypoxia is associated with an enhanced pro-fibrotic gene profile in the tissue and, more significantly, that hypoxia-induced pro-fibrotic changes in cardiac fibroblasts are associated with global DNA hypermethylation. Based on this epigenetics data, we have conducted a gene-specific methylation study to investigate methylation changes that occur in hypoxic ventricular fibroblasts and to gain novel insights into pathways and mechanisms that may contribute to post-ischemic cardiac remodelling.

Methods Human ventricular cardiac fibroblasts were exposed to 1% oxygen for up to 8 days. Global methylation changes were assessed using anti-5-methylcytosine (5 MeC) staining, flow cytometry, QPCR, and western blot. Gene-specific methylation changes associated with hypoxia and an increased fibrotic state were determined by 5 MeC immunoprecipitation and GeneChip human promoter arrays (Affymetrix), and validated by bisulphite genomic sequencing (BGS). Gene functional classification and pathway analysis were performed (DAVID, FUNRICH).

Results Hypoxia-induced pro-fibrotic changes in cardiac fibroblasts included increased cell proliferation and increased alpha smooth muscle actin, collagen 1, DNMT1 and DNMT3 B expression which associated with global DNA hypermethylation. Array analysis revealed 32 gene-specific hypermethylation changes and 101 hypomethylation changes occurred in hypoxia. Fifteen pathophysiologically relevant genes (5 hypermethylated, 10 hypomethylated) were identified by functional classification and pathway analysis to have a role in cardiac fibrosis, extracellular matrix remodelling, transforming growth factor beta signalling, cell proliferation, wound repair, ischemia, hypertension, hypertrophy, and heart failure. These are being validated using bisulphite genomic sequencing.

Conclusion Epigenetic modifications and changes in the epigenetic machinery identified in cardiac fibroblasts during prolonged hypoxia may contribute to the pro-fibrotic nature of the ischemic milieu in the heart during disease. The application of epigenetic based therapy, such as DNA methylation modifiers, as a treatment option for cardiac pathologies associated with fibrosis and ischemia may provide therapeutic benefit.

64 SCREENING OF PATIENTS WITH A FAMILY HISTORY OF PREMATURE CORONARY ARTERY DISEASE

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10.1136/heartjnl-2017-ICS17.63

Introduction Family history of premature coronary artery disease (pCAD) increases CAD risk in first-degree family members by 2 to 3-times by increasing susceptibility to atherosclerosis development. Screening and appropriate risk management could result in avoidance of myocardial infarction or sudden cardiac death.

Aim To assess for evidence of atherosclerotic coronary disease, through computed tomography coronary angiography (CTCA), in patients with a family history of pCAD (FHx +), to guide appropriate management and follow up.

Method This was a single-centre, cross sectional study conducted in the Cardiac Risk in Younger Persons (CRYP) centre between the years 2009–2016. A total of 547 patients were assessed clinically, including blood investigations. Individuals were considered for CTCA when they were 10 years younger than the earliest cardiac event in the family.

Results 230 of the cohort (42%) had a total cholesterol level >5 mmol/L. 33 of these individuals have had CTCA to date. 16 (48%) who underwent CTCA had evidence of atherosclerosis, with 4 (12%) requiring intervention either by means of Primary Coronary Intervention or Coronary Artery Bypass. 12 individuals (36%) had evidence of non-obstructive coronary plaques and commenced on secondary prevention with aspirin and statin. The remaining 52% have been reassured and managed conservatively with lifestyle advice and plans to reassess in 5 years. Subanalysis of CTCA results comparing patients with high total cholesterol (> 5 mmol/L) levels with pCAD (FHx+) and patients without a family history of pCAD (FHx-) showed 50% of FHx+ patients showed plaque requiring intervention compared to 16.6% (1 out of 6) in FHx-.

Conclusion Our study demonstrated that the risk of having a family history of pCAD increased healthy, asymptomatic individuals risk of CAD, with almost 2-fold risk increase. Although screening in asymptomatic patients is controversial, given the socioeconomic impact from the consequence of CAD in this group of patients; it potentially allows early detection and alteration of the natural history. In addition, over 50% of our cohort with a positive family history and elevated cholesterol showed no evidence of plaque formation, and can potentially defer pharmacological therapy pending reassessment. A lack of current guidelines on age to commence formal CV risk assessment and risk management, results in ad hoc practices. Studies of families with genetically proven FH confirm that not all affected individuals develop premature atherosclerosis, and therefore do not require early aggressive pharmacological intervention. CTCA is emerging as a promising modality to improve screening in this population given the low radiation dose with ECG-gated CTCA, and should be considered even in low-risk patients with a family history of pCAD.

Abstract 64 Table 1 Demographics of 230 patients with an elevated total cholesterol

Parameter	Number(Percentage)
Family history <40 years	49(17)
LDL >3 mmol/L	196(85)
HDL < 1 mmol/L	190(83)
Diabetes	5(2)
Current/Ex-Smoker	44(19)
Homocysteine <15	147(64)
Lipoprotein (a) <72	113(49)

Oral presentation session 4

65 THE WHO, THE WHERE, AND THE WHAT OF THE IRISH CARDIOLOGY HIGHER SPECIALIST TRAINING SCHEME 1998–2017

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10.1136/heartjnl-2017-ICS17.64

Aims On behalf of the IBTCM we completed a retrospective study of trends in the Higher Specialist Training (HST) Scheme in Cardiology since its inception in 1998 (relates to the Rep. of Ireland trainees only). Our intention was to examine the data for any notable trends in gender balance, completion rates, subspecialty training location, subspecialty, eventual geographical post location, and public/private mix.

Methods A database was compiled by the second author. This data was augmented by information gathered from online sources including published resumes, hospital departmental profile pages, PubMed author searches and professional profiles published on LinkedIn.

Results A total of 136 doctors have entered the Cardiology HST Scheme since 1998. 90 have qualified, 28 are currently in training, 3 are on a leave of absence, 12 are presently on fellowship/subspecialty training, and 3 have resigned from the scheme. The gender balance was found to be as follows male v female: Overall: 70%v30%. Qualified: 72%v28%. In Training: 57%v 43%. On average the scheme took 6.3 years to complete. On average 7.4 doctors are enrolled on the scheme each year (nadir of 4 in 2009, peak of 10 in 2002 and 2006). On average 5 doctors qualify from the scheme each year (nadir of 1 in 2000, 2 in 2004, peak of 10 in 2012). Private only posts – in the 5-year period of 2007 to 2011, 2 such posts were filled, from 2011–2016, 7 such posts were filled.

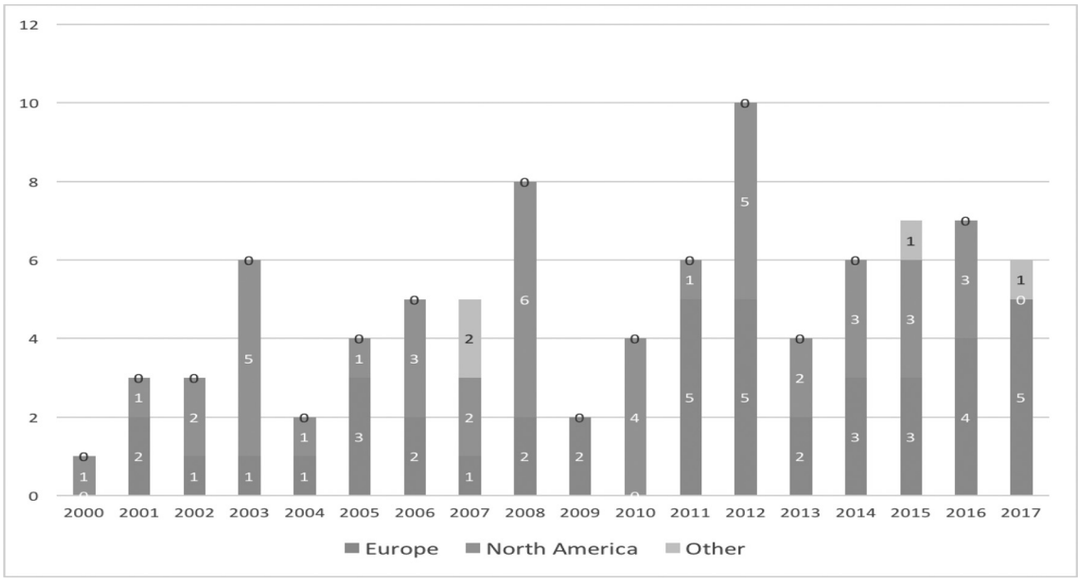
Abstract 65 Table 1 Subspecialty of those who have qualified since 1998. Included are 13 (14.4%) who hold dual accreditation in general medicine

Subspecialty	Count	Percentage
Interventional	45	42.9
Imaging	22	24.4
Electrophysiology	8	8.9
Heart Failure	5	5.6
Public Health / Prevention	2	2.2
Sports Cardiology	2	2.2
Non invasive	1	1.1
General	5	5.6
Other	1	1.1
Congenital	2	2.2
Research	1	1.1

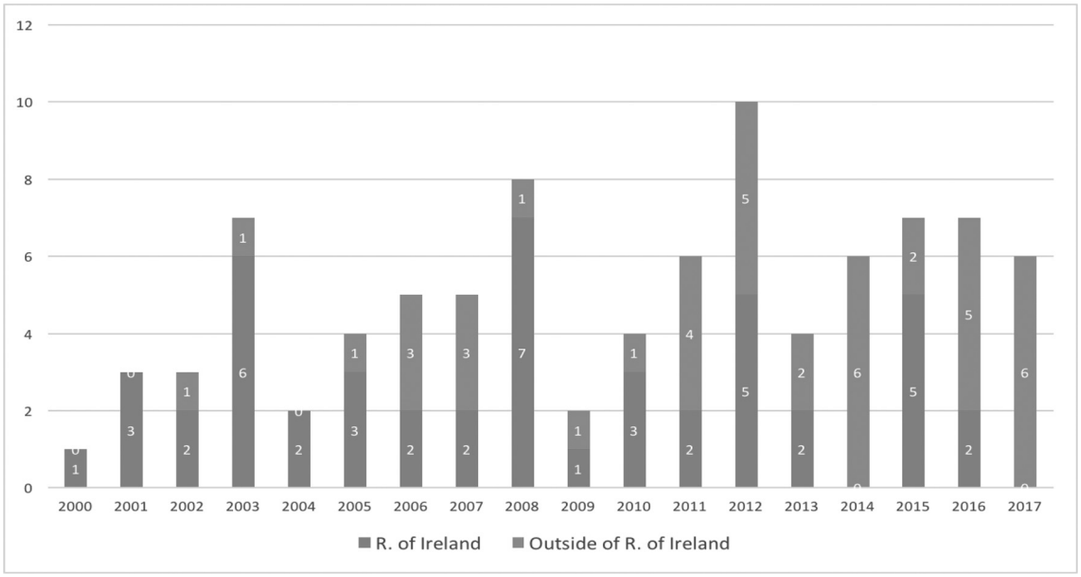
In geographical terms, after qualification, the most popular post location was Ireland (53.3%), followed by the USA (14%), then the UK (12%).

Conclusions The HST Scheme has a high rate of successful completion. In Ireland cardiology remains a male dominated specialty (27% female), though there is a trend seen in the current trainees towards greater gender equality. This is in marked contrast to the gender balance found in cardiology trainees across Europe(Female:43%Ireland,70%Europe) and in Irish HST trainees in general (55% female).

Interventional cardiology (46%) followed by imaging (24%) (encompassing Echocardiography, Cardiac CT and MRI) eclipse the other subspecialties, combined those specialties make up 70% of those qualified since 1998. A small but notable increase in those qualifying with EP subspecialisation was in seen in the last 10 years, however only 1 out of 6 of those



Abstract 65 Figure 1 Subspecialty training location grouped by year of qualification



Abstract 65 Figure 2 Breakdown of those working in Ireland versus abroad post qualification grouped by year of qualification

qualifying found posts in Ireland. In geographical terms, a little over half of those enrolled on the scheme return to Ireland post qualification. North America remains a popular choice for subspecialty training. However, in more recent years there seems to be a trend towards increased subspecialty training in Europe. An increased popularity in private only posts has been noted in recent years. It is hoped that this work will in the future be expanded to include comparisons with data from the UK and the EU as a whole.