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Thursday, 3rd October 2013

Session 1 **Interventional Cardiology**
Chair: Prof. David Foley

18.30–21.00 Case Reviews

Session 2 **Electrophysiology**
Chair: Prof. David Keane

18.30–21.00 Case Reviews

Friday 4th October

08.30–09.00 Registration

08.55–09.00 Welcome from Dr Donal Murray, President

Session 3 **Imaging**
Chair: Dr Caroline Daly

09.00–09.30 **Can we improve post - MI cardiac remodeling using fish oil? A randomized control trial using cardiac magnetic resonance imaging**
Prof Raymond Kwong
Brigham & Women's Hospital, Boston

09.30–10.30 **Oral Presentations**

1. One Year Follow Up of the CAPP Study: A Randomised Controlled Trial Comparing EST to Cardiac CT
McKavanagh P, Lusk L, Ball PA, Trinick TR, Duly E, Verghis RM, Agus AM, Walls GM, McCusker S, Orr C, Hamilton A, Harbinson MT, Donnelly PM
Ulster Hospital, Dundonald, Belfast, NI

2. Prevalence of Cardiac Abnormalities in the Turner Syndrome Population in Northern Ireland
Noad RL, McManus J, McKeown PP, Muir AR
Belfast Health and Social Care Trust, NI

3. Clinical Application of Perfusion CMR in Assessment of Suspected Coronary Artery Disease
James S, Waterhouse DF, Barrett M, Murphy TM, McAdam B, Foley DF, Sheahan RS, O'Hanlon R
Centre of Cardiovascular Magnetic Resonance, Blackrock Clinic, Dublin, Ireland

4. Hypertrophic Cardiomyopathy: Clinical and Imaging Characteristics of an Irish HCM Registry
McClelland S, O'Connor SA, Donohue S, Lavelle L, McErlean A, Dodd J, O'Hanlon R, Meaney J, McCreery CJ, Clarke J, McDonald K, Quinn M, Erwin JE, Quigley PJ, Maurer BJ, Keane D
St. Vincent's University Hospital, Dublin, Ireland

5. T1 Mapping Detects Myocardial Oedema in a Rat Model of Myocardial Ischaemia
O h-Ici D, Jeuthe S, Kozerke S, Kuehne T, Berger F, Messroghli D
German Heart Institute, Berlin; King's College, London, UK; University and ETH Zurich, Switzerland

6. Clinical Outcomes of Patients with Low-Flow, Low Gradient Severe Aortic Stenosis and Either Preserved or Reduced Ejection Fraction Undergoing TAVR
*O'Sullivan CJ, *Stortecky S, †Heg D, *Pilgrim T, *Hosek N, *Zanchin T, *Meier B, *†Windecker S, *Wenaweser P
*Swiss Cardiovascular Centre, Bern University Hospital; †Clinical Trials Unit, Bern University Hospital, Switzerland

10.30–11.00 **Poster Presentation**
Exhibition/Coffee

7. In-Vivo Study of Myocardial Metabolic Changes in a Rat Model
O h-Ici D, Weiss K, Sigfridsson A, Wissman L, Busch J, Messroghli D, Kozerke S
German Heart Institute, Berlin; King's College, London, UK; University and ETH Zurich, Switzerland

8. Significant Radiation Dose Reductions in Advanced Cardiac CT Imaging—Are We Keeping Up with the Guidelines? Our Experience with Ireland's Only 320 Slice
Kindler H, King G, Clarke J
Eagle Lodge Cardiac Centre, Limerick, Ireland

9. Exposure to Ionizing Radiation when Monitoring for Chemotherapy-Related Cardiotoxicity Using Multigated Acquisition Scanning: Does It All Add Up?
Murtagh G, Addetia K, Yu Z, DeCara J
University of Chicago, Chicago, Illinois, USA

10. Increased Anteroseptal Wall Thickness in HIV Positive Males Compared to Healthy Male Controls
Morgan RB, Loy A, O'Dea S, Mulcahy F, Meaney J, Daly CA
St James's Hospital Dublin, CAMI St James's Hospital, Dublin, Ireland

11. Serum Amyloid P-Component Update: Potential Mechanism by Which SAP Attenuates LV Remodelling in Hypertensive Heart Disease
Horgan S, Watson C, Glezeva N, Neary R, Ledwidge M, McDonald K, Baugh J
Conway Institute, University College Dublin, Dublin, Ireland

12. Adverse Impact of Smoking on Mortality and Kidney Transplantation Among Patients with and without Cardiovascular Disease in End Stage Kidney Disease
Roche D, Lim RY, Yermak D, Casserly L, Cronin C, Hannigan A, Kiernan T, Stack A
University Hospital Limerick, Limerick, Ireland

13. Renal Artery Sympathetic Nerve Anatomy in The Human: A Histologic Post-Mortem Study to Guide Future Catheter Denervation Strategies
Roy AK, Cunningham M, Buckley U, Waterhouse DF, Crotty T, Keane D
St. Vincent's University Hospital, Dublin, Ireland

14. Vendor Independent Software for Rapid Comprehensive Assessment of Changes in Left Ventricular Function During Serial Echocardiographic Studies
Murtagh G, Mor-Avi V, Tsang W, Bhave NM., DeManby B, Kruse E, Yamat M, Lang RM, DeCara JM
University of Chicago, Chicago, Illinois, USA

15. The Association Between Timeliness of Reperfusion Therapy, Left Ventricular Function and In-Patient Mortality of Stemi Patients Presenting Out of Hours vs Working Hours
Barry T, Lim RY, Fitzpatrick N, Kiernan TJ
University Hospital Limerick, University of Limerick, Graduate Entry Medical School, Ireland

Session 4 **Electrophysiology**
Chair: Dr Carol Wilson

11.00–11.30 **Broad Complex Tachycardia: What is the Mechanism?**
Dr Peter O'Callaghan
Cardiff & Vale NHS Trust, Cardiff, UK

11.30–12.30 Oral Presentations

16. Does the In-Patient Management of Atrial Fibrillation Differ Significantly Depending on Team of Care?
Morgan RB, Faller E, Fenelon A, Mahon C, Blennerhassett L, Curtin L, McMahon G, Murphy RT, Daly CA
St James's Hospital, Dublin, Ireland

17. Comparison of a Novel 14-day Adhesive Continuous ECG Monitoring Patch to Traditional 24-hour Holter Monitoring in Symptomatic Arrhythmia Patients
Barrett P, Komatireddy R, Topol EJ
Scripps Translational Science Institute, 3344 N. Torrey Pines Court, Suite 300 La Jolla, CA 92037, USA

18. Prevalence of Atrial Fibrillation and Impact on Clinical and Imaging Characteristics in an Irish Registry of Patients with HCM
McClelland S, O'Connor S, Keane D
St. Vincent's University Hospital and Blackrock Clinic, Co Dublin, Ireland

19. Treadmill Exercise Test Measurements as a Diagnostic Tool in Relatives of Long QT Syndrome Patients
[1]Noonan B, [2]Moran D, [2]Gallagher M, [2]Mahon N, [2]Galvin J, [3]Watson W, [2]McGorrian C
[1]School of Medicine and Medical Science, UCD, Dublin, Ireland
[2]Department of Cardiology, Mater Misericordiae University Hospital, Dublin, Ireland
[3]Department of Cardiology, Connolly Hospital, Blanchardstown, Dublin, Ireland

20. Frequent Premature Atrial Contractions are Associated with Increased Mortality and Recurrent Stroke Following Ischaemic Stroke/TIA
[1]Keaney JJ, [2]Akijian L, [1]Mulholland D, [2]Ní Chróinín D, [2]Hannon N, [2]Sheehan O, [1]McGorrian C, [1]Blake G, [1]Mahon N, [3]Kyne L, [3]Duggan J, [2,3,4],Murphy S, [2]Kelly PJ
[1]Cardiology Department, Mater Misericordiae Hospital, Dublin, Ireland
[2]Department of Stroke, Mater Misericordiae University Hospital, Dublin, Ireland
[3]Medicine for the Elderly, Mater Misericordiae University Hospital, Dublin, Ireland
[4]Royal College of Surgeons in Ireland, Dublin, Ireland

21. Pulse Width Optimisation of ICD Defibrillation Waveform is both a Safe and Effective Programming Strategy at Time of Implant
Nolan PG, McFadden C, MacNeill BD, Crowley J, Nash PJ, Daly K
University College Hospital, Galway, Ireland

12.30–14.00 Lunch/Exhibition

Session 5 **Structural Heart Disease**
Chair: Dr Nicola Johnston

14.00–14.30 **Radiation Induced Heart Disease**
Dr Brian Griffin
Cleveland Clinic

14.30–15.30 Oral Presentations

22. Is Valve Choice the Main Determinant of Paravalvular Leak Post Transcatheter Aortic Valve Implantation?
Gough A, O'Sullivan K, Barry M, Hurley J, Sugrue D
Mater Misericordiae University Hospital, Dublin, Ireland

23. Renal Sympathetic Denervation Improves Nocturnal Dipping in Hypertensive Patients
Tuohy S, Ryan L, Gleeson J, MacNeill B, Nash P, Daly K, Crowley J, Sharif F
University College Hospital Galway, Galway, Ireland

24. Sutureless Aortic Valve Replacement: A Rapid Deployment, Minimally Invasive Alternative in Surgical Aortic Valve Replacement
O' Sullivan KE, Murphy A, Casserley I, Sugrue D, Hurley J
Mater Misericordiae University Hospital, Dublin, Ireland

25. Resection of Renal Cell Carcinoma Extending into The Heart: Avoidance of Deep Hypothermic Circulatory Arrest
McBride M
Royal Victoria Hospital, Belfast

26. Can Low Volume Adult Congenital Surgery be Delivered Safely in a High Volume Adult Cardiac Surgery Unit?
Austin CR, Wood AE, Graham ANJ
Royal Victoria Hospital, Belfast, NI

27. The St Jude Trifecta™ Aortic Valve: Early Clinical Experience from a Single Centre in the West of Ireland
McVeigh TP, Keita L, Steter D, O'Connor M, Blach A, Kolcow W, Veerasingam D
West of Ireland Cardiothoracic Unit, University College Hospital, Galway, Ireland

15.30–16.00 **Poster Presentation**
Exhibition/Coffee

28. Clinical Outcomes of Trans-Catheter Aortic Valve Replacement at a Tertiary Cardiac Centre in Ireland
Neylon A, Casserly I, Sugrue D, Hurley J, Blake G, McGorrian C, Moran B, McAdam B, Foley D, Diamond P
Mater Misericordiae University Hospital, Dublin, Ireland

29. Atrial Septal Defect And Left Atrial Appendage Closure: A Single Centre Experience
Ryan N, Mc Adam BF, Foley DP
Beaumont Hospital, Dublin, Ireland

30. Second Generation Left Atrial Occlusion Devices: A Single Centre Experience
Canniffe C, Neylon A, McCann C, Casserly I, Walsh K
Mater Misericordiae University Hospital, Dublin, Ireland

31. Prevalence of Pacemaker Requirement Post Medtronic Corevalve® Implantation
Noad RL, Manoharan G, Spence MS
Belfast Health and Social Care Trust, Belfast, NI

32. Audit of Safety and Efficacy Outcomes of Patients Undergoing Left Atrial Box Isolation for Atrial Fibrillation
O'Neill L, Hensey M, Keane D
St. Vincent's University Hospital, Elm Park, Dublin, Ireland

33. Why Do Patients With Bicuspid Aortic Valve Undergo Surgery?
Canniffe C, Neylon A, O'Neill JO, Nolke L, Redmond M, McCarthy J, Walsh K
Mater Misericordiae University Hospital, Dublin, Ireland

34. Is Post-Mortem Evaluation of Cardiac Rhythm Management Devices Useful?
Nolan PG, Hynes S, Tuohy S, Macneill BD, Nash PJ, Crowley J, Daly K
Galway University College Hospital, Galway, Ireland

35. Implantable Cardioverter-Defibrillators in Heart Transplant Recipients: A Single Centre Experience
Neylon A, Canniffe C, Parlon B, Egan J, McCarthy J, Mahon N, O'Neill JO
Mater Misericordiae University Hospital, Dublin, Ireland

36. Cost-Effective Bridging to Cardiac Transplantation: A Future For Ventricular Assist Devices?
Tracey C, Lawler Z, O'Neill JO, McCarthy J, Egan J, Mahon NG
Mater Misericordiae University Hospital, Dublin, Ireland

37. An Audit of the Prescription of Clopidogrel with Reference to Duration of Therapy and Instructions for Use
[1]Sutton-Fitzpatrick U, [2]Natin S. [2]Reilly D
[1]University of Limerick, Limerick, Ireland, [2]General Practice, Limerick, Ireland

Session 6 **Young Investigator Award**
Chair: Dr Donal Murray
Judges: Dr John Harold, Dr Patrick O'Gara, Dr. Nick Boon

16.00–17.00 **Oral presentations**

38. Restoration of Platelet Function with Platelet Transfusion in Acute Coronary Syndrome and Cardiac Surgery Patients on Dual Antiplatelet Therapy: The APTITUDE Study
O'Connor SA, Martin R, Amour J, Abtan J, Kerneis M, Silvain J, Brugier D, Leprince Pascal, Montalescot G, Collet JP
Institut de Cardiologie, INSERM UMRS937, Pitié-Salpêtrière Hospital (AP-HP), Université Paris 6, France

39. Dynamic Surface ECG Markers of Arrhythmogenic Right Ventricular Cardiomyopathy Patients Undergoing Electrophysiology Studies
Sugrue A, Finlay MC, Lambiase PD
Institute of Cardiovascular Science, The Heart Hospital, University College Hospital, University of London

40. The Effect of Multiple Micronutrient Supplementation in Patients with Chronic Stable Heart Failure: A Randomized, Placebo-Controlled Trial
[1,3]McKeag NA, [1]McKinley MC, [1]Woodside JV, [2,3]Harbinson MT, [1,3]McKeown PP
[1]Queen's University, Centre for Public Health, Belfast, NI
[2]Queen's University, Centre for Vision and Vascular Science, Belfast, NI
[3]The Heart Centre, Belfast Health &Social Care Trust, Belfast, NI

41. Circulating Endothelial Cell Enriched Gene Expression Analysis in Acute Myocardial Infarction
Barrett PM, Topol EJ
Scripps Translational Science Institute, 3344 N. Torrey Pines Court, Suite 300 La Jolla, CA 92037, USA

17.00–17.30 **ICS AGM**

17.45–18.45 **Stoke Lecture**
Atherosclerosis Across 4,000 years of Human History: The HORUS Study of 4 Ancient Populations
Dr. John G Harold
President, American College of Cardiology

19.45 **Reception**

20.30 **Dinner**

Saturday 5th October

08.00–09.00 Cardiology Education and Training Update

09.00–09.15 **Monitoring high radiation dose effects in patients and staff: The new reality for interventional cardiology practice**
Dr Paddy Gilligan
Mater Hospital, Dublin, Ireland

09.20–09.30 Brian McGovern Travelling Fellowship Report
Dr. Terence Prendiville

Session 7 **Revascularisation**
Chair: Andrew Maree

09.30–10.00 **Stent failure and neoatherosclerosis: Insights from optical coherence tomography and role of novel catheter therapies**
Dr. Robert Byrne
Munich Heart Centre, Germany

10.00–11.00 **Oral presentations**

42. Association of Non-Infarct Related Coronary Artery Chronic Total Occlusion with Mortality in Patients Presenting with ST-Elevation Myocardial Infarction: A Systematic Review and Meta-Analysis
O'Connor SA, Sanguineti F, Garcia AC, Hovasse T, Unterseeh T, Morice MC, Benamer H, Lefèvre T, Garot P, Louvard Y
Institut Cardiovasculaire Paris Sud: Institut Hospitalier Jacques Cartier, Massy, France

43. Appropriateness of Helicopter Transfer for Primary Percutaneous Intervention
Colleran R, McInerney A, Mulveen V, Daly K
Galway University Hospital, Galway, Ireland

44. Continuous Quality Improvement in the National ACS Programme, The West of Ireland Experience to Date
Colleran R, McInerney A, Mulveen V, Walsh R, Sharif F, Nash P, MacNeill B, Crowley J, Daly K
University College Hospital, Galway, Ireland

45. Retrograde Autologous Prime: Is There an Association Between Improved Haemoglobin Content During Adult Cardiac Surgery?
Haughey N, Booth K, Jeganathan R
Dept of Cardiac Surgery, Royal Victoria Hospital, Belfast, NI

46. Optical Coherence Tomography in the Days Following Primary PCI; Sobering Findings
Ryan N, Foley DP
Beaumont Hospital, Dublin, Ireland

47. Pre-Hospital Diagnosis of STEMI: Is Electronic Electrocardiogram Transmission Superior to Paramedic Catheterisation Lab Activation
Colleran R, McInerney A, Daly K
University College Hospital, Galway, Ireland

11.00–11.30 **Poster Presentation**
Exhibition/Coffee

48. ATOLL Bio-Thrombotic Markers 1
O'Connor SA, Ankri A, Kerneis M, Abtan J, Brugier D, Galier S, Silvain J, Vicaut E, Collet JP, Montalescot G
Institut de Cardiologie, INSERM UMRS937, Pitié-Salpêtrière Hospital (AP-HP), Université Paris, France

49. ATOLL Thrombotic Markers 2.
O'Connor SA, Kerneis M, Ankri A, Abtan J, Brugier D, Silvain J, Ecollan P, Vicaut E, Collet JP, Montalescot G
Institut de Cardiologie, INSERM UMRS937, Pitié-Salpêtrière Hospital (AP-HP), Université Paris, France

50. Management of Allograft Vasculopathy Post Cardiac Transplant in the Era of Drug Eluting Stents
Canniffe C, Neylon A, Parlon B, Egan J, McCarthy J, Mahon NG, O'Neill JO
Mater Misericordiae Hospital, Dublin, Ireland

51. Application of ESC Guidelines to Rationalise Acceptance Criteria and Streamline Inpatient Cardiac Catheterisation
Tweedie J, Niall Herity N
Belfast City Hospital, Belfast, NI

52. In the Current Era of St Elevation Myocardial Infarction Treatment, What Patients are Not Reperfused? An Observational Analysis
[1]McGovern L, [2]Kiernan T
[1]University College Cork, Cork, Ireland, [2]University Hospital Limerick, Limerick, Ireland

53. Audit of Rates And Timeframe Of Radial Artery Occlusion Post Radial Angiography
O'Neill L, Chandra R, Fahy C, Mc Carthy-Deering E, Cronin E, Owens P
Waterford Regional Hospital, Waterford, Ireland

54. A Real World Comparison of Outcomes in Transradial Versus Transfemoral Access for Primary PCI: Single Centre Experience
Colleran R, Durcan R, Judge C, Nolan P, Sharif F
University College Hospital, Galway, Ireland

55. A Study in Syncope: A Review of 94 Tilt Table Tests
Monaghan M, McCarron M, Purvis J
Departments of Cardiology and Neurology, Altnagelvin Hospital, Western HSC Trust, Londonderry, NI

56. Electrocardiographic Criteria for Predicting Infarct Related Artery Occlusion in Inferior Wall Acute Myocardial Infarction
Elhanan M, Hamra M, Ali M, Murray D
Sligo Regional Hospital, Sligo, Ireland

57. Early Experience of Cardiac Exercise Testing in A Primary Health Care Facility
[1]O Casaide S, [1]Cuddihy B, [2]King G, [2]Kindler H, [2]Clarke J
[1]Ayrfield Medical Centre Kilkenny, Ireland, [2]Eagle Lodge (Aut Even Hospital Kilkenny), Ireland

58. Night Time Blood Pressure And Sub-Clinical Target Organ Damage: Findings from an Irish Primary Care Based Population Sample
O'Flynn AM, Kearney P, Curtin R, Perry I
University College Cork/Cork University Hospital, Cork, Ireland

59. Retrospective Analysis of Lipid Profiles in Very High Risk Patients Requiring PCI. Are We Adhering to the Guidelines?
Lim RY, Fitzpatrick N, Barry T, Ahern C, Abdalla A, Hussainni A, Lobo R, Stack A, Kiernan TJ, Hennessy T, Meany B, Abbass S, Hynes B
University Hospital Limerick, Limerick, Ireland

Session 8 **Heart Failure/General Cardiology**
Chair: Dr Angie Brown

11.30–12.00 **Today's research is tomorrow's prevention**
Prof. Peter Weissberg
British Heart Foundation

12.00–13.00 **Oral Presentations**

60. STEMI Care in Ireland: Initial Experience of a New National Protocol and Information System
[1]Jennings S, [2]Cavanagh B, [3] Daly K
[1]Dept of Public Health, HSE; [2]HSE South; [3]University College Hospital Galway, Ireland

61. Trends in Hospitalisation for Acute MI in Ireland 1997–2008
[1]Jennings SM, [2]Bennett K, [2]Lonergan M, [1]Shelley E
[1]Department of Public Health, HSE, Dublin, Ireland; [2]Department of Pharmacology and Therapeutics, Trinity Centre for Health Sciences, St James's Hospital, Dublin, Ireland

62. A National Evaluation of the Aspirin Response
Kenny D
The National Cardiovascular and Stroke Research Network, RCSI, Dublin, Ireland

63. Poor Cardiovascular Health of Patients Who Begin Haemodialysis in the Mid West Region of Ireland: A Pilot Initiative for a National Study
Roche D, Lim RY, Yermak D, Casserly L, Cronin C, Hannigan A, Kiernan T, Stack A
Department of Nephrology, Department of Cardiology, University Hospital Limerick, Limerick, Ireland

64. Vortex Formation Time in the Assessment of Patients with Newly Diagnosed Haemochromatosis
[1]Byrne D, [1]Almuntaser I, [1]Walsh J, [2]Ellis L, [1]King G1, [2]Norris S, [1]Murphy RT
[1]St James's Hospital, Dublin, Ireland; [2]Gastroenterology, St James's Hospital, Dublin, Ireland

65. Hospitalisation for Heart Failure: Are We Getting to the Heart of the Matter?
Sugrue A, Havelin A
University College Hospital, Galway, Ireland

13.00 **Close of meeting**

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Session: Imaging

1. One Year Follow Up of the CAPP study: A Randomised Controlled Trial Comparing EST to Cardiac CT

McKavanagh P, Lusk L, Ball PA, Trinick TR, Duly E, Verghis RM, Agus AM, Walls GM, McCusker S, Orr C, Hamilton A, Harbinson MT, Donnelly PM

Ulster Hospital, Dundonald, Belfast, NI

Purpose: This is the 1 year follow-up of The Cardiac Computerised Tomography (CT) for the Assessment of Pain and Plaque (CAPP) study. [ISRCTN52480460]. The study compared the economic and clinical outcomes of using cardiac CT compared to Exercise Stress Test (EST) in stable troponin negative chest pain.
Method: CAPP is a cost-utilisation analysis randomised controlled trial. 500 patients without known coronary artery disease received either EST or cardiac CT. All patients were followed up for re-hospitalisations rates and adverse events and for angina symptoms with the well established Seattle Angina Questionnaires (SAQ).
Results: Of the 500 patients randomised 12 withdrew over the year, resulting in 245 in the EST arm and 243 in CT arm receiving follow up. The mean age was 58.3 years and a mean Diamond Forrester score of 46.4 %. There were with no significant differences in the pre-test probabilities, age, sex or risk factors. Over the 1 year follow up period there were 29 Emergency Department (ED) chest pain attendances in the EST arm, with 13 unplanned admissions, compared to 8 ED attendances with 2 unplanned admissions in the CT arm. There were also more cardiology outpatient attendances in the EST arm.
In the EST arm there were 7 patients who underwent Coronary Artery Bypass Grafting (CABG) and 12 who had Percutaneous Coronary Intervention (PCI), compared to 9 CABG and 29 PCI in the CT arm.

At 1 year 408 (81.6 %) patients had returned the SAQ, 210 in the CT arm and 198 in the EST. There were significant improvements in the SAQ angina stability and quality of life scores at 1 year in the CT arm ($p \leq 0.05$).
Conclusions: Cardiac CT as an index investigation for stable chest pain improved angina stability and quality of life, resulting in fewer planned and unplanned hospital attendances.

2. Prevalence of Cardiac Abnormalities in the Turner Syndrome Population in Northern Ireland

Noad RL, McManus J, McKeown PP, Muir AR

Belfast Health and Social Care Trust, Belfast, NI

Objectives: There is an increased frequency of cardiac abnormalities in patients with Turner syndrome. The exact prevalence and subsequent management of these patients, has not been extensively studied.
Methods: Patients with Turner Syndrome, who attended cardiology, gynaecology or genetic clinics in the Belfast Trust, were identified and demographic and clinical data obtained.
Results: 148 patients were identified and divided into groups by karyotype; group 0 for karyotype unknown (n = 16), group 1 for monosomy (n = 63), group 2 for mosaic karyotype (n = 26) and group 3 for structural X chromosome aberrations (n = 43). The mean age was 28 years (±15.4). The prevalence of cardiovascular risk factors were: hypertension 8.1 %, hypercholesterolaemia 10.8 %, diabetes mellitus 5.4 %, ischaemic heart disease 2 %. Cardiac abnormalities were present in 33.8 % of patients (see table below), with bicuspid aortic valve the most common (18.2 %), and intervention was required in 8.1 %. Those in group 1 had the highest incidence of abnormalities and those in group 3 had the lowest.
Conclusions: The prevalence of cardiac abnormalities in Turner patients greatly exceeds that of the normal population and may be dependent on karyotype and therefore cardiac imaging and follow up should be mandatory especially in those of childbearing potential.

	Total (n = 148) (%)	Group 0 (n = 16) (%)	Group 1 (n = 63) (%)	Group 2 (n = 26) (%)	Group 3 (n = 43) (%)
Bicuspid Aortic Valve	27 (18.2)	5 (31.2)	13 (20.6)	5 (19.2)	4 (9.3)
Aortopathy	20 (13.5)	6 (37.5)	11 (17.4)	3 (11.5)	0 (0)
Coarctation	14 (9.5)	0 (0)	11 (17.4)	2 (7.7)	1 (2.3)
Patent Ductus Arterious	9 (6.1)	0 (0)	6 (9.5)	3 (11.5)	0 (0)
Atrial Septal Defect/Patent Foramen Ovale	8 (5.4)	0 (0)	4 (6.3)	3 (11.5)	1 (2.3)
Ventricular Septal Defect	6 (4.1)	0 (0)	4 (6.3)	1 (3.8)	1 (2.3)
Anomalous Pulmonary Venous Drainage	2 (1.4)	0 (0)	2 (3.2)	0 (0)	0 (0)
Transposition of Great Arteries	1 (0.7)	0 (0)	0 (0)	1 (3.8)	0 (0)
Dissection	1 (0.7)	0 (0)	1 (1.6)	0 (0)	0 (0)
Valvular abnormality	18 (12.2)	5 (31.2)	9 (14.3)	2 (7.7)	2 (4.7)
Ventricular impairment	3 (2.0)	0 (0)	2 (3.2)	1 (3.8)	0 (0)

3. Clinical Application of Perfusion CMR in Assessment of Suspected Coronary Artery Disease

James S, Waterhouse DF, Barrett M, Murphy TM, McAdam B, Foley DF, Sheahan RS, O'Hanlon R

Centre of Cardiovascular Magnetic Resonance, Blackrock Clinic, Dublin, Ireland

Introduction: Invasive coronary angiography is the gold standard in investigation of suspected coronary artery disease (CAD). However, newer imaging modalities are becoming of greater interest in evaluation of suspected coronary ischaemia as they provide non-invasive assessment of coronary circulation. In particular, adenosine perfusion cardiac magnetic resonance (AP-CMR) imaging has shown promise in evaluation of low-risk patients in whom CAD is suspected. We therefore wished to determine the prognostic value of normal AP-CMR in patients with suspected CAD.

Methods: CMR imaging was performed using a 1.5T GE Scanner with adenosine stress. Study endpoints included re-hospitalisation for chest pain, obstructive coronary artery disease on angiography, non-fatal myocardial infarction (MI) and cardiac death.
Results: Three hundred and seventeen patients (131 female, mean age 47 ± 6.8 years) were enrolled. All patients had suspected CAD and were deemed to be low-risk. All enrolled patients had a normal AP-CMR with no stress hypoperfusion, and no delayed enhancement demonstrated. Indications for CMR included exertional angina, equivocal exercise stress tests and syncope. On 12-month follow up, no patients achieved the measured endpoints. Notably, there was no MI or cardiac death. Additionally, AP-CMR had an excellent safety profile, with only three patients developing complications, all of which were minor and did not require specific treatment.
Conclusion: Our data support the utility of AP-CMR as a non-invasive tool in the investigation of CAD in low-risk patients. A normal AP-CMR predicts a very low adverse event rate and an excellent 12-month prognosis in patients with suspected CAD. AP-CMR may have a role in reducing the number of inappropriate coronary angiographies.

4. Hypertrophic Cardiomyopathy: Clinical and Imaging Characteristics of an Irish HCM Registry

McClelland S, O'Connor SA, Donohue S, Lavelle L, McErlean A, Dodd J, O'Hanlon R, Meaney J, McCreery CJ, Clarke J, McDonald K, Quinn M, Erwin JE, Quigley PJ, Maurer BJ, Keane D

St. Vincent's University Hospital, Dublin, Ireland

Background: Hypertrophic cardiomyopathy (HCM) is the most common inherited cardiac disorder and is the leading cause of sudden cardiac death (SCD) in the young. HCM is associated with significant heterogeneity in terms of phenotypic expression and clinical course, and clinical characteristics may differ among HCM populations internationally. It is important, therefore, to establish a registry to characterise the HCM population in Ireland.
We have previously presented data from a registry comprising 99 HCM patients (O'Connor, 2011). Here we present a comprehensive analysis of an expanded registry of 162 patients, describing patient demographics, risk factors for SCD, ICD discharge events, echocardiographic and cardiac MRI (CMR) characteristics.
Methods: Patients with HCM were identified in St Vincent's University and Private Hospitals, and Blackrock Clinic by review of patient records, CMR, echocardiogram, holter and ICD reports. Clinical details, symptom status, imaging indices and ICD data were recorded.
Results: 162 patients with HCM were identified. The majority (63.6 %) were male. Median age at registration was 59 years (range 17–90 years). Risk factors for SCD were prevalent: 39 patients (24.1 %) had documented non-sustained ventricular tachycardia (NSVT), 15 had history of syncope (9.3 %), 48 had family history of HCM (29.6 %), 33 had family history of SCD (20.4 %), 1 had an aborted SCD (0.6 %), 2 patients (1.2 %) had LV wall thickness of >30 mm, and 4 of 59 patients (6.8 %) who underwent exercise stress test had a hypotensive response to exercise.
Atrial fibrillation (AF) was documented in 56 patients (34.6 %). The prevalence of CVA and TIA was 6.8 and 4.9 %, respectively.
Symptom status was known for 126 patients. The majority (75.4 %) were NYHA Class I, 21.4 % were NYHA Class II and 3.2 % NYHA Class III. Chest pain, palpitations and pre-syncope were present in 25.4, 14, and 6.2 %, respectively.
47 patients (29 %) had ICDs in situ. Shocks were documented in 13 patients (27.7 %). 11 (84.6 %) had experienced an inappropriate shock, the main trigger for which was AF (63.6 %).
Echocardiogram reports were available for 127 patients. The average ejection fraction (EF) was 65.7 ± 0.91 %. Systolic anterior motion (SAM) of the mitral valve was documented in 28.3 % of cases. 29 patients (17.9 %) had LVOT outflow obstruction >30 mmHg. Average dimensions were as follows: left atrial diameter 44.1 ± 1.03 mm, LVEDD 47.34 ± 0.66 mm, LVESD 29.5 ± 0.64 mm, IVSD 18.48 ± 0.55 mm, posterior wall thickness 12.65 ± 0.45 mm.
93 patients underwent CMR. The presence and extent of myocardial fibrosis, as demonstrated by late gadolinium enhancement (LGE) had been shown to have prognostic significance in HCM (O'Hanlon et al.). Fibrosis was demonstrated in 63 patients (67.7 %), SAM in 25 cases (26.9 %) and right ventricular involvement in 7 cases (7.5 %). Average EF was 68.73 ± 1.22 %. Cardiac dimensions were as follows: Maximal wall thickness was 19.56 ± 0.66 mm, Anterior septal wall thickness 18.39 ± 0.86 mm, Posterior septal wall thickness 9.98 ± 1.06 mm, End diastolic 49.61 ± 1.02 mm, End systolic dimension 28.86 ± 1.05 mm, Left atrial diameter 38.9 ± 1.2 mm.
Asymmetric septal HCM was the most common morphological variant. Apical-variant HCM was present in 19 patients (20 %), a higher proportion than reported in other Western cohorts.
Conclusion: These data expand significantly on the initial report from this registry, providing comprehensive baseline characteristics for the Irish HCM cohort. Important findings include the high prevalence of AF and CVA, and the high proportions of patients with myocardial fibrosis, SAM and apical-variant HCM. To our knowledge this is the largest cohort of patients with HCM in Ireland, and the continued expansion of this registry with regular reporting of data will provide a valuable means by which to document, analyse, and prospectively evaluate the characteristics and outcomes of the HCM population in Ireland.

5. T1 Mapping Detects Myocardial Oedema in a Rat Model of Myocardial Ischaemia

O h-Ici D, Jeuthe S, Kozerke S, Kuehne T, Berger F, Messroghli D

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Purpose: Ischemic cell death is characterized by cellular oedema. Cardiovascular magnetic resonance (CMR) can be used to detect oedema using T2 weighted imaging, but this technique has a number of technical limitations. T1 mapping is a quantitative measurement which car directly reflects the amount water in a tissue. Changes in T1 reflect changes in tissue composition. Our aim was to study the development of oedema in a small animal model of myocardial Ischemia.
Methods: Rats (n = 8) underwent coronary occlusion for 30 min followed by 60 min of reperfusion to delineate the time course of development of changes in non-contrast T1 abnormalities. T1 was quantified by 3.0 T CMR (Phillips) using a Small Animal Look-Locker Inversion Recovery (SALLI) sequence. T1 was quantified over time starting from baseline prior to occlusion in the remote zone and in the area at risk.
Following the experiment the hearts were removed. The coronary artery was reoccluded to allow delineation of the area at risk with evans blue, then stained using triphenyltetrazolium chloride (TTC). This defined 1-Area at Risk, 2-Infarction [white], 3-Salvaged myocardium [stained red from TTC], and 4-Remote [Stained blue].
Results: On coronary occlusion all rats developed myocardial ischemia initially confirmed by ECG changes and ventricular arrhythmia. Fatal arrhythmia occurred in 2 Rats.
During occlusion T1 increased in the area at risk ($p < 0.001$). This increase was noted within the first 10 min of coronary occlusion and

remained unchanged during the 30 min period of ischemia ($p = 0.74$) and following reperfusion at 30 ($p = 0.83$) and 60 min ($p = 0.81$).
Conclusions: During coronary occlusion, T1 increases in the area at risk consistent with the formation of ischemia. This change is noticeable with 10 min of coronary occlusion. T1 mapping is a robust quantitative method to detect the effects of myocardial ischemia.

6. Clinical Outcomes of Patients with Low-Flow, Low Gradient Severe Aortic Stenosis and Either Preserved or Reduced Ejection Fraction Undergoing TAVR

*O'Sullivan CJ, *Stortecky S, †Heg D, *Pilgrim T, *Hosek N, *Zanchin T, *Meier B, *†Windecker S, *Wenaweser P

*Swiss Cardiovascular Centre, Bern University Hospital, †Clinical Trials Unit, Bern University Hospital, Switzerland

Objectives: We aimed to assess the safety and efficacy of transcatheter aortic valve implantation (TAVI) among patients presenting with paradoxical low-flow, low-gradient, severe aortic stenosis (AS) (PLFAS) and classical low-flow, low-gradient severe AS (LFLG).
Background: The clinical outcomes of patients presenting with low-gradient severe AS undergoing TAVI are unclear.
Methods: Of 533 symptomatic patients undergoing TAVI, 385 had a full pre-procedural right and left heart catheterization. 208 patients had high-gradient AS (HGAS; mean gradient [MG] ≥40 mmHg), 85 had PLFAS (MG ≤40 mmHg, indexed aortic valve area [iAVA] ≤0.6 cm^2 m^{-2}, stroke volume index ≤35 ml/m^2, ejection fraction (EF) ≥50 %) and 61 had LFLG (MG ≤40 mmHg, iAVA ≤0.6 cm^2 m^{-2}, EF ≤40 %).
Results: Compared with HGAS, PLFAS and LFLG had higher systemic vascular resistances (HGAS: 1912 ± 654 vs PLFAS: 2006 ± 586 vs LFLG: 2216 ± 765 dyne s cm^{-5}, $p = 0.007$) but lower valvulo-arterial impedances (HGAS: 7.8 ± 2.7 vs PLFAS: 6.9 ± 1.9 vs LFLG: 7.7 ± 2.5 mmHg mL^{-1} m^{-2}, $p = 0.027$). At 30-days, no differences in cardiac death (6.5 vs 4.9 vs 6.6 %, $p = 0.90$) or death (8.4 vs 6.1 vs 6.6 %, $p = 0.88$) were observed among HGAS, PLFAS and LFLG groups, respectively. At 1-year, New York Heart Association functional improvement occurred in most surviving patients (HGAS: 69.2 % vs PLFAS: 71.7 % vs LFLG: 89.3 %, $p = 0.09$) and no significant differences in overall mortality were observed (17.6 %, vs 20.5 %, vs 24.5 %, $p = 0.67$). Compared with HGAS, LFLG had a higher 1-year cardiac mortality (adj hazard ratio 2.45, 95 % confidence interval 1.04–5.75, $p = 0.04$).
Conclusions: TAVI in PLFAS or LFLG patients is associated with clinical outcomes comparable with HGAS patients and all groups profit symptomatically to a similar extent.

10.30–11.00 **Poster Presentation Coffee/Exhibition**

7. In-Vivo Study of Myocardial Metabolic Changes in a Rat Model

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Background: Hyperpolarized 13C-labeled tracers offer the first method to measure cardiac substrate metabolism in real time and in vivo (1). Understanding the metabolic changes that occur in myocardial ischemia could help in diagnosis and treatment. Our aim was to study if the regional metabolic changes that occur following coronary occlusion were detectable in a small-animal model.
Methods: Myocardial metabolism was studied with MRS using Rats ($n = 6$) who were injected with 2 ml of 90 mM hyperpolarized [1-13C] pyruvate over 7 s via a tail vein before and after coronary occlusion. The left coronary artery was occluded for 30 min for create myocardial ischemia followed by reperfusion using a closed chest method (2). Scanning was performed using a horizontal bore 9.4T Bruker Biospec system with a 13C/1H radiofrequency (RF) volume coil and a 13C receive surface coil placed over the heart. ECG, respiration rate, and body temperature were monitored throughout the experiment. Anatomical images were acquired prior to 13C-imaging for spatial localization of the heart and correct coil positioning. To investigate the metabolic changes in ischemia, hyperpolarized (13) C-labelled pyruvate was injected prior to coronary occlusion, following reopening of the coronary artery. The dynamic time series were acquired by collecting 13C spectra prior to each injection of hyperpolarized [1-13C] pyruvate. The MRS-images with hyperpolarised [1-13C] pyruvate were acquired in a short-axis view of the heart using a cardiac- and respiratory-gated CSI pulse sequence. [1-13C] pyruvate was hyperpolarized using a custom built DNP system. Following the experiment the hearts were removed. The coronary artery was re-occluded to allow delineation of the area at risk and staining for myocardial infarction. This was then correlated with the metabolic maps.
Results: Before infarction, a uniform and myocardium specific distribution of the lactate and alanine signal was detected in the metabolite maps over the anterior wall of the left ventricle. After ischemia the signal from alanine, and bicarbonate was reduced, with an increase in lactate, whereas, in the region not affected by infarction, the signal levels were comparable to the levels before coronary occlusion.
Conclusion: This study demonstrates that hyperpolarized 13C MRS can be used to visualize regional changes in cardiac metabolism in rats after myocardial infarction. This method holds promise for the investigation of ischemic heart disease, and may provide a role in guiding future therapies.

8. Significant Radiation Dose Reductions in Advanced Cardiac CT Imaging—Are We Keeping Up with the Guidelines. Our Experience with Ireland's Only 320 Slice

Kindler H, King G, Clarke J

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Introduction: We report our experience with Irelands first and only 320 Slice Multi Detector Row scanner in Advanced CT Coronary Angiography (CTCA).
CTCA is increasingly used in the non-invasive assessment of patients with suspected coronary artery disease and low to intermediate Framingham risk of CAD. It is possible to achieve significant dose reductions with careful adjustment of several scanning parameters. We report our experience of significant dose reductions with currently available CT technology and discuss possible future areas of study and quality improvement in Cardiac CT Angiography.
Methods: Prospective unselected enrolment of 100 patients attending for routine scanning for first assessment of significant coronary stenosis for Calcium scoring & CTCA. Small FOV, 85 kV, Dynamically triggered volume acquisition, prospectively gated CT data acquisition protocol in one single heart beat.
Results: (N = 100) Average(±)SD:
Age 56 yr(±)9, HR 56 bpm, KV:85(±)9 Average total body dose (1.71 mSv(±) 0.26, min 0.7, max 2.7. (mA)69(±)30.

Conclusion: It is possible to significantly reduce radiation dose for a comprehensive cardiac CT study compared with current practice yet benefit from an increase in detector density and higher resolution (0.5 × 0.5 mm). The total dose of CT angiography with our method is 23 % lower than the Calcium score alone. We propose that further dose reductions are possible by reducing the tube voltage of the calcium scan from the standard 120 described initially by Agatston in 1990 to 80 kV without significantly compromising signal to noise (SNR) or contrast to noise (CNR) ratio.

9. Exposure to Ionizing Radiation when Monitoring for Chemotherapy-Related Cardiotoxicity Using Multigated Acquisition Scanning: Does It All Add Up?

Murtagh G, Addetia K, Yu Z, DeCara J

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Background: Anthracyclines and trastuzumab are central to breast cancer treatment but can be cardiotoxic. Sequential measurements of Left Ventricular Ejection Fraction (EF) using either Transthoracic Echocardiography (TTE) or Multigated Acquisition (MUGA) scans are advised while on trastuzumab. No international guidelines exist to aid in deciding which modality to use, but clinical trial protocols indicate that the same modality should be employed throughout treatment. MUGA is associated with lower inter- and intra- observer variability, but each scan results in exposure to approximately 8 mSv ionizing radiation. The maximum recommended dose per year for those working with radioactive materials is 50 mSv; however cancer patients may also undergo Computed Tomography (body-approximately 10 mSv). Few Irish hospitals currently employ MUGA, but TTE services are stretched and questions are being raised as to whether MUGA would be preferable. The aim of this study was to review the use of TTE and MUGA at a centre where both are employed, and evaluate radiation exposure.
Methods and Results: Electronic records from breast cancer patients treated with anthracyclines and/or trastuzumab from January 2010-January 2012 at a tertiary hospital in the US were reviewed. Those whose cardiac imaging was performed elsewhere were excluded.
Of 80 patients, 38 (48 %) had sequential TTEs performed, 31 (39 %) MUGA and the remaining 11 (13 %) both TTE and MUGA performed while on treatment. The mean number of MUGA scans per patient was 1.8 ± 1.2 and TTEs 2.3 ± 1.4. Among those in whom ≥one MUGA was performed, the mean radiation dose was 41 ± 19 mSv and 7(9 %) were exposed to over 50 mSv radiation in 1 year. The contribution made by MUGA was not insignificant in these 7 (average 3 scans = 24 mSv).
Conclusions: The contribution made by MUGA scans to total radiation exposure should be considered in cancer patients. TTE is likely preferable for patients in whom extracardiac imaging incorporating radiation exposure is being planned.

10. Increased Anteroseptal Wall Thickness in HIV Positive Males Compared to Healthy Male Controls

Morgan RB, Loy A, O'Dea S, Mulcahy F, Meaney J, Daly CA

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Introduction: In the HIV positive patient cardiovascular disease is a complex multifactorial process with many possible contributors.
Aim: To study an asymptomatic group of HIV positive men on antiretroviral therapy (ART) and compare them to age and sex matched controls in order to detect underlying cardiovascular (CV) disease.
Methods: Prospective cohort study of asymptomatic HIV positive men on ART compared to male controls. Baseline demographics, 12 lead ECG, routine biochemistry, NT-proBNP, fasting lipids and glucose were recorded. Images were acquired on a 3T Achieva Philips scanner with 5 channel phase array cardiac coil and weight based IV gadolinium was given at 0.15 mmol/kg dose with post contrast inversion recovery imaging after 10 min. Philips Viewforum software was used for post processing. Diastolic function was assessed using phase contrast analysis of mitral inflow to calculate E:A ratio.
Results: HIV patients (n = 168) were matched for age, sex and traditional CV risk factors (table 1). There was no significant difference in left ventricular volumes or late gadolinium enhancement (LGE) of the myocardium, although a number of clinically significant cases (n = 7) were detected. Increased anteroseptal (AS) wall thickness (table 1) in cases compared to controls may indicate early myocardial fibrosis or triglyceride deposition which warrants further investigation using MR spectroscopy in these patients. Factors which predicted increased AS on multiple linear regression included positive family history (p = 0.046), increased BMI (p = 0.001) and increased Framingham risk score (p = 0.035).
Conclusion: Increased AS wall thickness in HIV positive patients may be an early marker for myocardial fibrosis or triglyceride deposition. Further investigation with MR spectroscopy is warranted in these cases.

	Cases (168)	Controls (34)	P value
Age (mean, years ± SD)	46.49 (±8.68)	43 (±8.5)	*0.03
Smoking (pack years)	13.7 (±17.7)	5.58 (±9.41)	*<0.001
Hypertension (%)	16.7	11.8	0.648
T2DM (%)	6	5.9	1.0
BMI (mean ± SD)	25.65 (±3.5)	27.25 (±3)	*0.016
Framingham Risk	9.9 (±7.48)	9.6 (±8)	0.64
Hypercholesterolaemia (%)	35.3	17.6	0.071
FamHx (%)	38	26.2	0.225
TRIG (mmol/l)	1.82 (±1.2)	1.48 (±0.97)	0.218
LVEF (mean, %)	65.7 (±5.64)	66 (±6.46)	0.8
E/A ratio (mean)	1.33 (±0.46)	1.44 (±0.4)	0.144
Mean AS (mm)	10.7 (±2)	9.8 (±1.93)	*0.021
LGE (%)	4.16	0	0.605

Table 1 Results. T2DM = type 2 diabetes, FamHx = family history of premature CAD, TRIG = hypertriglyceridaemia. LVEF = left ventricular ejection fraction. AS = anteroseptal wall thickness.

11. Serum Amyloid P-Component Update: Potential Mechanism by Which SAP Attenuates LV Remodelling in Hypertensive Heart Disease

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Purpose: Last year, we showed that treatment with serum amyloid P-component (SAP) inhibits deposition of perivascular collagen and

reduces cardiomyocyte hypertrophy in spontaneously hypertensive rats. We hypothesised that these beneficial effects related to a reduction in pro-fibrotic macrophages evidenced by lower serum levels of chemotactic proteins and a reduction in macrophage staining in the myocardium. We are currently investigating a mechanism in vitro and present our findings to date.

Methods: Rat alveolar macrophages (NR8383) are treated with various cytokines to induce polarisation to a specific functional phenotype. Rat neonatal cardiomyoblasts (H9c2) are incubated with various phenylephrine and conditioned macrophage media combinations. SAP is introduced at different stages of the experiment. Cardiomyoblasts are stained by immunofluorescence and mean cell area estimated with ImageJ software. Quantitative real time polymerase chain reaction is used to determine genetic expression of macrophage phenotypic markers and hypertrophic genes.

Results: A 50 % increase in cell area is found in cardiomyoblasts treated with phenylephrine ($p < 0.001$). Nuclear area is also increased ($p < 0.01$). SAP does not affect cellular area in cardiomyoblasts treated with or without phenylephrine. Macrophages incubated in medium with interferon-γ and lipopolysaccharide have a marked increase in iNOS and IL1β expression compared to controls. Cardiomyoblasts incubated in this M1 macrophage conditioned media have increased cellular area ($p < 0.001$). Macrophages incubated in medium containing IL4, IL10, IL13 and dexamethasone assume an alternative/M2 macrophage phenotype. Expression of the cell surface receptor CD206 is found to be increased in these subtypes and how they influence cardiomyoblast morphology is under investigation.

Conclusions: While SAP does not exert any direct effect on cell size, factors secreted by the pro-inflammatory M1 macrophage phenotype appear to promote cardiomyoblast hypertrophy. It is likely that SAP indirectly attenuates cellular hypertrophy via its effect on macrophages. The impact of SAP on LV remodelling by influencing macrophage behaviour continues to be examined.

12. Adverse Impact of Smoking on Mortality and Kidney Transplantation Among Patients with and without Cardiovascular Disease in End Stage Kidney Disease

Roche D, Lim RY, Yermak D, Casserly L, Cronin C, Hannigan A, Kiernan T, Stack A

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Background: Smokers experience higher rates of adverse outcomes than non-smokers in the general population. The extent to which smoking contributes to adverse outcomes among new patients with pre-existing cardiovascular disease approaching ESKD has not been fully explored. The aim of this study was to investigate the clinical impact of smoking on the risks of mortality and kidney transplantation among US patients with and without clinical cardiovascular disease at dialysis initiation.

Methods: National data on 823, 753 incident dialysis patients between May 1995 and December 2004 and followed until October 31, 2006, were analyzed from the United States Renal Data System. Patients with the following clinical cardiovascular conditions were identified at dialysis initiation: coronary artery disease, peripheral vascular disease and stroke. Multivariable Cox regression evaluated the relative hazard ratios (HR) for death and kidney transplantation at 2 years follow-up stratified by cardiovascular condition and by smoking status.

Results: The mean age was 62.8 years old, 54 % were male, and the majority were white. Adjusted mortality risks were significantly higher for patients with cardiovascular conditions who continued to smoke compared with those who did not and remained significant following multivariable adjustment. Conversely, the risks of kidney transplantation were significantly lower for all patients with known cardiovascular disease and in particular those who continued to smoke as described below:

	Smoker	Non Smoker	Smoker	Non Smoker
Hazard Ratio for Death				
CAD	1.5	1.26	1.25	1
PVD	1.55	1.34	1.22	1
Stroke	1.25	1.53	1.33	1
Hazard Ratio for Kidney Transplantation				
CAD	0.66	0.55	0.32	1
PVD	0.33	0.44	0.32	1
Stroke	0.35	0.48	0.61	1

Conclusions: Continued smoking among new dialysis patients with cardiovascular conditions is associated with adverse clinical outcomes and reduced lifespan. Preventative strategies directed at smoking cessation should be aggressively pursued at all stages of CKD to improve patient survival.

13. Renal Artery Sympathetic Nerve Anatomy in The Human: A Histologic Post-Mortem Study to Guide Future Catheter Denervation Strategies

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Background: Although catheter-based renal artery denervation is an effective therapy for drug-resistant hypertension, gaps still exist in our understanding of the pathophysiology of renal nerve injury, as well as ideal methods and locations to deliver optimal thermal tissue modulation. In this novel study we describe in detail the anatomy of the human renal artery sympathetic plexus, under physiologic perfusion conditions.

Methods: Post-mortem renal arteries ($N = 9$) were harvested en bloc, and formalin fixed using a perfusion fixation system. Three anatomical blocks were made through the arteries- distal, mid, and proximal, with gross anatomy analyzed using Haematoxylin and Eosin stains, followed by specific immunohistochemistry staining for identification of afferent/efferent nerve plexuses (tyrosine hydroxylase, CGRP, Substance P). Nerve distance from the lumen was measured, as well as segmental nerve densities along the length of the renal artery. We then compared the differences in plexus location between perfusion fixed and the non-fixed samples, and examined potential variations between our human samples and reported porcine renal artery nerve anatomy.

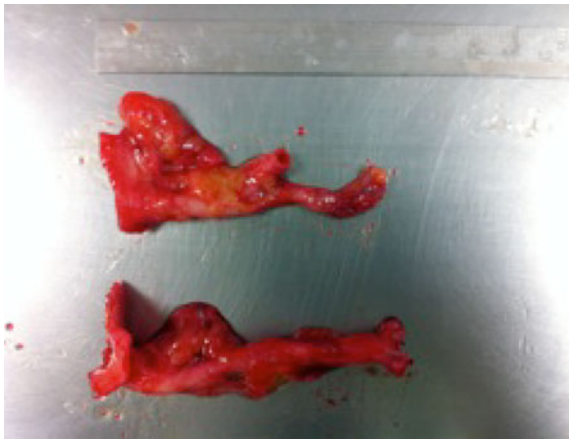

Fig. 1

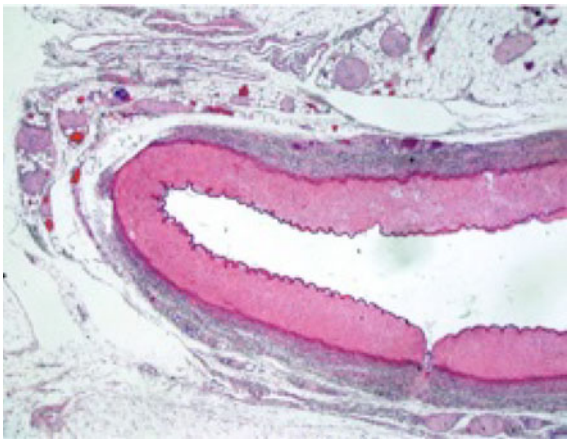

Fig. 2

Results: The luminal to nerve diameters, segmental nerve densities, as well as patient characteristics are presented in Table 1. The renal artery blocs were carefully debulked (Figure 1), and Figure 2 demonstrates the standard measurements as described (with basic H and E stains).
Conclusion: This novel human post-mortem study describing histologic and spatial locations of renal artery sympathetic nerve plexuses under physiological conditions may help to guide future catheter denervation strategies.

14. Vendor Independent Software for Rapid Comprehensive Assessment of Changes in Left Ventricular Function During Serial Echocardiographic Studies

Murtagh G, Mor-Avi V, Tsang W, Bhave NM, DeManby B, Kruse E, Yamat M, Lang RM, DeCara JM

University of Chicago, Chicago, Illinois, USA

Background: Sequential evaluation of left ventricular (LV) function is critical in patients receiving potentially cardiotoxic treatments. However, identification and interpretation of the clinical significance of subtle changes in LV function from echocardiographic images is time-consuming and requires training. The aim of this study was to develop and test a new approach aimed at addressing this issue.
Methods and Results: Dedicated semi-automated software was developed (Epsilon Imaging), which analyzes images obtained during serial examinations and provides a visual, easy-to-understand display of changes in LV ejection fraction (EF), peak systolic global longitudinal strain (GLS) or both. To test this software, 30 subjects who had 2 echocardiographic studies separated by $\geq$4 weeks were identified and their images analyzed. An expert echocardiographer reviewed EF and GLS data separately using commercial software (Philips QLab), and classified EF and/or GLS in each patient as unchanged, improved or worsened. This classification was used as a reference to test the accuracy of using a combined display of changes in EF and GLS (see image). This was performed by an inexperienced observer with and then without the dedicated software.
Image analysis and interpretation were faster using the dedicated software (27 $\pm$ 5 vs 15 $\pm$ 5 min). The agreement with the reference was slightly better with the dedicated software (93 %; kappa = 0.90) than without it (90 %; kappa = 0.87).
Conclusions: Combined displays of changes in EF and GLS data from serial studies allows quick, easy and accurate interpretation of changes in LV function, promising to improve follow-up of patients undergoing potentially cardiotoxic treatments such as chemotherapy.

15. The Association Between Timeliness of Reperfusion Therapy, Left Ventricular Function and In-Patient Mortality of Stemi Patients Presenting Out of Hours vs Working Hours

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Aim: The aim of our study was to compare the outcomes in STEMI patients presenting to the ED during working hours versus those presenting out of hours.
Method: We retrospectively analysed data relating to 184 patients presenting to UHL with STEMI between January 2011 and October 2012. The mean age was 62 years ($\pm$11.6) with a male preponderance of 73 %. 90 (49 %) patients presented outside of working hours (OWH) and 94 patients (51 %) presented inside working hours (IWH).
Results: The overall in-hospital mortality rate was 4.9 % (9/184). There was no significant difference with respect to in-hospital mortality (4.3 % IWH Vs 5.56 % OWH, p = 0.683). The IWH group were more likely to receive PPCI (55.4 % Vs 8.9 %). Thrombolysis was utilized more commonly in the OWH group (64 % Vs 25 %). Of those that were thrombolysed during working hours 66.7 % (16)achieved a door-to-needle time of less than thirty minutes compared with 67 % (39) in the OWH Group. In reference to the patients receiving PPCI 62.5 % (5) achieved a door-to-balloon time of less 90 min in the OWH group compared with 65.4 % (34) in the IWH group. We examined each patient's ejection fraction (E.F.) after admission and/or during follow-up. We found that 14.9 % (n = 25) had significant LV Dysfunction (E.F. <35 %). Of this group, 56 % presented during OWH (44 % IWH).
Conclusion: In conclusion, despite having significant difference in modality of reperfusion therapy, we found no significant difference in terms of mortality or E.F. in patients presenting within working hours vs those presenting outside working hours.

Session: Electrophysiology

16. Does the In-Patient Management of Atrial Fibrillation Differ Significantly Depending on Team of Care?

Morgan RB, Faller E, Fenelon A, Mahon C, Blennerhassett L, Curtin L, McMahon G, Murphy RT, Daly CA

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Background: Atrial fibrillation (AF) is the most common sustained arrhythmia, with significant impact on morbidity and health costs. Its management varies widely and becomes ever more important as its prevalence grows with an increasingly ageing population.
Aim: To assess the outcome of patients with AF and any variation depending on the medical team managing the condition during an acute admission.
Methods: Prospective observational study in a Dublin university teaching hospital. Consecutive patients over 4 time individual points(Dec, Mar, June, Sept) with AF detected on admission ECG or on telemetry were included. Patient demographics, clinical details, treatment and initial outcomes were recorded.
Results: 346 patients with known or new AF were identified. Mean age 75.5 ± 11.4 years (range 29–103). 53 % male. Mean length of stay 13 (±26) days. AF was the primary reason for admission/attendance in 23.4 % of cases. Of these 41 % were managed by the medical team on call, 40 % by cardiology and 19 % by the emergency department. Patients managed medically were more likely to have a longer LOS ($p < 0.001$), to be on digoxin on discharge ($p < 0.001$) and to be readmitted within 30 days ($p = 0.015$). Those managed by cardiology were more likely to have an echo done during stay ($p < 0.001$), left heart cath ($p < 0.001$), inpatient cardioversion ($p = 0.014$), PPM insertion ($p = 0.005$) and flecainide on discharge ($p < 0.001$). They were also more likely to be in sinus rhythm on discharge ($p < 0.001$). There was no significant difference in incidence of TOE, R heart cath, AF ablation, prescription of amiodarone, ACE inhibitors, or warfarin on discharge depending on team of care.
Warfarin prescribing rate at discharge was 50.3 %. Factors predictive of non prescription of warfarin despite an indication as per ESC guidelines include older age ($p < 0.001$), female gender ($p = 0.064$), type of AF (permanent > acute > PAF > persistent) ($p < 0.001$) and absence of concomitant CCF on CXR at presentation ($p < 0.001$).
Mean CHADS and CHADSVASC scores were 2.31 ± 1.2 and 3.85 ± 1.7 respectively. Mean HASBLED score was 2.32 ± 1.1.
Conclusion: The management of patients with AF presenting to the ED varies widely depending on primary team of care. This likely has a significant impact on cost of inpatient care and warrants further study.

17. Comparison of a Novel 14-day Adhesive Continuous ECG Monitoring Patch to Traditional 24-hour Holter Monitoring in Symptomatic Arrhythmia Patients

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Background: The transient, sporadic nature of arrhythmias render them difficult to detect and characterize using traditional, 24 h holter monitoring due to limitation that include the need for patients to wear cumbersome electrodes, a short monitoring window, and limitations placed on patient activity. Clinically significant arrhythmias are often missed. The Zio® Patch is an FDA approved adhesive, light weight, single-use, one lead ECG monitor that is worn on a patient's chest for up to 14 days continuously recording cardiac rhythm. No additional wires or external electrodes are needed. Use of this adhesive patch in patients referred for ambulatory cardiac monitoring should provide a higher diagnostic yield when compared to holter monitoring.
Methods: 146 patients with suspected arrhythmias wore both a holter monitor for up to 24 h and an adhesive patch monitor for 14 days. Data from both the holter monitor and the adhesive patch was analyzed for the detection of six arrhythmias including atrial fibrillation, supraventricular tachycardia, atrioventricular block, pauses, ventricular tachycardia and ventricular fibrillation. McNemar's test was used to determine if differences exist between detection in the adhesive patch and the holter, with a significance level of 0.05.
Results: Of the 146 patients 64 % (93) had at least one of the 6 pre specified arrhythmia detected by the adhesive patch monitor and 44 % (64) by the holter monitor ($p < 0.01$). There were 39 (27 %) clinically relevant arrhythmias (SVT excluded) detected by the adhesive patch and 28 (19 %) by the holter ($p = 0.01$).
Conclusion: Use of a 14 day adhesive patch monitor as compared to conventional holter monitoring identified significantly more of the two groups of pre specified arrhythmias in patients referred for ambulatory cardiac monitoring.

18. Prevalence of Atrial Fibrillation and Impact on Clinical and Imaging Characteristics in an Irish Registry of Patients with HCM

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Background: Atrial fibrillation (AF) is the most common sustained arrhythmia in patients with hypertrophic cardiomyopathy (HCM). Development of AF is associated with deterioration of clinical status and outcome. In HCM patients, increased left atrial size, age, and congestive heart failure symptoms are independent predictors of occurrence of AF. Here we report the prevalence and impact of AF in a 162-patient Irish HCM registry.
Methods: A registry of 162 patients with HCM attending St Vincent's University and Private Hospitals and Blackrock Clinic was generated and medical notes, echocardiogram, cardiac MRI (CMR) and implantable cardioverter-defibrillator (ICD) records were reviewed. Data are mean ± SEM, $P < 0.05$ indicated statistical significance.
Results: The prevalence of AF was 34.6 %. In AF patients, there was a male preponderance (61 vs 42 %) and trend towards increased age (59.7 ± 2.0 v 55.6 ± 1.7 years, $P = 0.06$).
AF patients were more likely to be symptomatic with 32.6 and 6.5 % in NYHA Class II or III, respectively, compared with 13.3 and 1.3 % of non-AF patients.
100 % of CVAs occurred in patients with AF, with a prevalence of 19.6 % in AF-patients.
Ejection fraction (EF) was significantly reduced in patients with AF compared with non-AF patients, measured by echocardiogram (60 ± 1.7 % vs 67.9 ± 0.9 %, $P = 0.0000007$) and CMR (61.2 ± 2.9 % vs 72 ± 1 %, $P = 000012$).

Left atrial diameter was significantly increased in AF patients, measured by echocardiogram (49.5 ± 1.8 mm vs 40.52 ± 1.05 mm, P = 0.000006) and CMR (46.2 ± 2.4 mm vs 36.4 ± 1.2 mm, P = 0.00009).
Myocardial fibrosis was detected by late gadolinium enhancement on CMR in 85.7 % of patients with AF, versus 60 % of non-AF patients.
Of those AF patients who received inappropriate ICD shocks, 100 % received shocks triggered by AF.
Conclusion: AF is common in the Irish HCM population, and is associated with increased risk of stroke, symptom deterioration and inappropriate ICD discharge. We have confirmed its association with increased myocardial fibrosis, reduced EF and increased LA diameter in this cohort.

19. Treadmill Exercise Test Measurements as a Diagnostic Tool in Relatives of Long QT Syndrome Patients

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Introduction: Long QT Syndrome (LQTS) is an inherited genetic disorder associated with arrhythmia and sudden cardiac death risk. Diagnosis is made on clinical evaluation. More recently, new diagnostic criteria using treadmill exercise test information have been published. We aimed to examine the predictive ability of this algorithm in comparison with established criteria for LQTS diagnosis.
Methods: A sample of 56 LQTS patients was selected from relatives of confirmed LQTS probands who attended screening at the Mater Misericordiae University Hospital Family Heart Screening Clinic. Data were collected on demographic, clinical and genetic parameters. Three exercise test measurements were chosen: supine QTc, 1 min recovery QTc (1mQTc) and 4 min recovery QTc (4mQTc), Original published cut offs (in ms) were used: QTc ≥ 470 (males) QTc ≥ 480 (females) for supine QTc, QTc ≥ 426 for 1mQTc and QTc ≥ 445 for 4mQTc. Area under the receiver operator characteristic (AUROC) curves were used to describe the discriminative ability in the LQTS gene positive group (n = 31), compared with the phenotype-negative comparator group (n = 15).
Results: LQTS1 (n = 8), LQTS2 (n = 13) and LQTS3 (n = 10) patients were included. Overall, the 4mQTc performed best in predicting LQTS gene status versus the comparator group, achieving 77.4 % sensitivity, 75.0 % specificity and an AUROC of 0.76 (95 % CI 0.61–0.91). The Schwartz 1985 criteria achieved a similarly high sensitivity and specificity at 77.8 and 66.7 % respectively with an AUROC of 0.72 (95 % CI 0.58–0.86). 4mQTc correctly classified 100 % of LQTS1 patients and 84.6 % of LQTS2 patients. 4mQTc was less reliable in LQTS3, with only 50 % sensitivity and 75.0 % specificity.
Conclusions: Our results show that the new exercise test measurements may be as useful as current diagnostic criteria for LQTS diagnosis. 4mQTc is particularly helpful in diagnosing LQTS1 and LQTS2 patients, but not LQTS3. This test can be a useful adjunct in screening relatives of LQTS probands.

20. Frequent Premature Atrial Contractions are Associated with Increased Mortality and Recurrent Stroke Following Ischaemic Stroke/TIA

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Background: Following ischaemic stroke or transient ischaemic attack (TIA) aggressive risk factor modification is undertaken to reduce recurrent events. Atrial Fibrillation (AF) is a strong risk factor for recurrent events. Frequent Premature Atrial Contractions (PACs) on 24-hour ambulatory (holter) monitors are associated with the subsequent development of AF.
Objective: We aimed to determine whether frequent PACs on holter monitors were associated with a primary endpoint of death or recurrent cerebrovascular events post stroke/TIA.
Methods: The North Dublin Population Stroke Study (NDPSS) 1 was a prospective cohort study of patients with stroke/TIA in 2005 and 2006. Analysis was carried out of holter monitors of patients in this study. Frequent PACs were defined as a rate of PACs ≥100 per 24 h. Telephone interview and medical chart review was used to determine recurrent events. The primary endpoint was all cause mortality or recurrent stroke/TIA.
Results: Follow-up was achieved in 76 cases (61.8 % male). Mean age was 69.3 ± 12.7 years. There were 18 recurrent events and 47 deaths. Kaplan–Meier event free survival demonstrated that patients within the frequent PACs group had significantly poorer outcomes. The primary endpoint occurred in 15 out of 18 patients in the frequent PACs cohort versus 27 out of 54 (p = 0.004, logrank test). The Hazard ratio for the primary outcome was 2.91 (95 % Confidence Intervals 1.28–6.64) for those with greater than 100 PACs on the holter. Median event free survival was 623 vs 2572 days. Multiple regression analysis revealed that the effect was independent of age, gender, hypertension and diabetes. Assessing the mortality and recurrent CVA/TIA rates individually, the frequent PAC cohort had also a significantly poorer rate of survival free from recurrent events (p < 0.05, logrank test) and mortality (p = 0.0005, logrank test).
Conclusion: Patients with a greater than 100 PACs per 24 h on holter monitors following stroke/TIA are at a significantly increased risk of death and recurrent cerebrovascular events compared with those with fewer PACs.

21. Pulse Width Optimisation of ICD Defibrillation Waveform is both a Safe and Effective Programming Strategy at Time of Implant

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Introduction: Pulse width optimisation of ICD defibrillation waveforms has been proposed as a means of reducing defibrillation thresholds.
The aim of this study was to assess whether pulse width optimisation based on the high voltage lead integrity (HVLI) measurement is a safe and effective. The HVLI measurement can also vary from the shock lead impedance (SLI) measured during shock delivery. The study also

aimed to investigate whether programming based on the HVLI would be different from that based on the SLI.
Methods: Patients with SJM ICD's, undergoing DFT testing, were enrolled. The HVLI was checked and the defibrillation waveform pulse width was optimised to Block 1 based on this. If a safety margin >10J was not achieved DFT was reperformed using Block 2 and subsequently Block 3 if required. SLI associated with shock delivery was noted.
Results: 102 patients, (m = 81.4 %, f = 18.6 %), mean age at implant of 60.5 years (27.2–80.0 years) were enrolled. 73.5 % were primary prevention and 26.5 % secondary prevention. Secondary prevention patients had a mean EF of 32.8 %, and the mean EF was 22.8 % in the prophylactic group.
95.1 % of patients achieved an adequate DFT safety margin using block 1 with a mean safety margin of 12.24J, 1.96 % were optimised to Block 2 with a mean safety margin of 10.2J and Block 3 was used in 2.94 % with a mean safety margin of 9.33J.
No significant difference between the HVLI and SLI (62.2 vs 65.19Ω, p = 0.113) or programming of the waveform based on the HVLI or the SLI was seen, either in Phase I (4.63 vs 4.75 ms, p = 0.09) or in Phase II (3.01 vs 2.97 ms, p = 0.13).
During a mean follow-up of 2.97 years, 13 patients had episodes of VF, defibrillated with first shock success.
Conclusion: Pulse width optimisation of ICD defibrillation waveforms is a safe and effective strategy at time of implant.

Session: Structural Heart Disease

22. Is Valve Choice the Main Determinant of Paravalvular Leak Post Transcatheter Aortic Valve Implantation?

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Background: Significant paravalvular regurgitation (PVR) following transcatheter aortic valve implantation (TAVI) is associated with poor survival. Unfavourable anatomic and pathological factors contribute. There is considerable variability in PVR rates reported. The two most popular valve delivery systems, Medtronic Corevalve (MCV) and Edwards Sapien (ES), differ significantly in structure and deployment technique.
Methods: A systematic review of literature looking at PVR at time-points up to 1 year, using different valve types was performed through Pubmed and bibliographic searches from 2008–2013. One analysis consisted of immediate, post-procedure and 30 day rates of PVR with 6 months and 1 year separately reviewed. A systematic review and meta-analysis of studies of PVR in MCV and ES was performed.
Results: Over 8000 patients from over 20 studies looking at PVR up to 1 year were examined; focusing on 9 studies comparing MCV versus ES outcomes, and other factors predisposing to PVR to ascertain if valve choice is the main determinant of PVR. Pooled rate of significant PVR was 9.0 % (95 % confidence interval: 5.5, 13.0). Rates at 6 months and 1 year were 10.2 % (95 % CI: 1.5, 24.9) and 7.0 % (95 % CI: 0, 26.5) respectively. Examining valve types; MCV displayed more PVR; 15.75 % [95 % CI 12.48–19.32] versus ES 3.93 % [95 % CI 1.05–8.38]. Comparing PVR rates by mixed-effects meta-regression with fixed-effect moderator variable for valve type, suggesting statistically significant difference in PVR rates between valves (p = 0.0002).
Conclusion: Approximately 10 % of patients develop PVR post TAVI, impacting on survival. There's no universally accepted method of reporting rates of PVR between studies which would be useful to ensure consistency in reporting. Numerous factors including valve choice impact on PVR. Evidence suggests that valve choice remains the most modifiable factor in reducing PVR post TAVI.

23. Renal Sympathetic Denervation Improves Nocturnal Dipping in Hypertensive Patients

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Aims: Renal sympathetic denervation is an emerging device based treatment for patients with resistant hypertension and has been shown to reduce blood pressure in this group.[1] Nocturnal Dipping is a phenomenon where a decrease in blood pressure of 10 % or more occurs during sleep. Nocturnal dipping has been shown to be protective against cerebrovascular and cardiovascular disease.[2] There is a paucity of data on the effect of renal sympathetic denervation on the circadian rhythm of blood pressure. This study aimed to assess the effect of renal sympathetic denervation on the 24 h blood pressure profile of patients with resistant hypertension.
Methods and Results: Patients with resistant hypertension scheduled for renal denervation in a single centre were included. All patients underwent bilateral renal artery ablations using the Symplicity™ renal denervation system. 24 h ambulatory blood pressure monitors were given to patients prior to the procedure and at 9 months post procedure. Software was used to calculate the degree of systolic, diastolic and mean arterial pressure dipping nocturnally. 12 patients had complete 9 month follow up at the time of this submission. At baseline, 5 patients (42 %) were diastolic nocturnal dippers and 3 (25 %) were systolic nocturnal dippers. 24 h ambulatory blood pressure monitors showed an overall decrease of 5 mmHg systolic and 5.5 mmHg diastolic despite a reduction in number of antihypertensive medications by over 20 %. Both systolic and diastolic nocturnal dipping improved significantly. Systolic dip increased by 6 mmHg (3 %) at 9 months post procedure (paired samples t-test p = 0.002). Diastolic dip increased by 5.6 mmHg (6 %) at 9 months post procedure (paired samples t-test p = 0.022). Of the 7 patients that were classified as diastolic non-dippers at baseline, 4 patients (57 %) became diastolic nocturnal dippers.
Conclusions: Renal sympathetic denervation is an effective method for management of resistant hypertension. An increase in systolic and diastolic nocturnal dipping was noted in this study. This effect may have additional cardiovascular benefits to the previously noted reduction in blood pressure with renal sympathetic denervation.
References: [1] The Symplicity HTN-2 Trial): Lancet 2010 Dec 4; 376(9756):1903–9[2] Hypertens Res. 2010 Jul; 33(7):652–6

24. Sutureless Aortic Valve Replacement: A Rapid Deployment, Minimally Invasive Alternative in Surgical Aortic Valve Replacement

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Introduction: A new class of rapid-deployment aortic valves has emerged with the potential to simplify minimally invasive aortic valve replacement. Sutureless aortic valves have the potential to shorten cross-clamp and cardiopulmonary bypass times in both minimally invasive valve-only surgery as well as valve replacement with concomitant procedures. We present a single-centre case series using the EDWARDS INTUITY Valve System (Edward Lifesciences LLC, Irvine, Calif) in the surgical management of severe aortic stenosis to assess feasibility and efficacy in patients with high operative risk.
Methods and Results: Valve implantation using the INTUITY valve was successfully performed in seven patients (4 men, 3 women, mean age 78.7 ± 12.9). Average cross-clamp time was 51 ± 20 min,

average cardiopulmonary bypass time was 72 ± 23. Four patients underwent aortic valve replacement only, three of which were performed via mini-sternotomy. Three patients underwent concomitant coronary artery bypass grafting also. Death, major cardiac or cerebrovascular events did not occur. Two post-operative complications occurred; a lower respiratory tract infection and re-intubation in a heavy smoker. Average hospital stay was 9 ± 3 days. Post procedure echocardiography confirmed excellent valve haemodynamics in all patients.

Conclusions: Surgical aortic valve replacement using the EDWARDS INTUITY Valve System is a feasible alternative in our experience thus far. Reduced aortic cross-clamp and cardiopulmonary bypass times are likely to result in improved patient outcomes in larger patient cohorts. Early haemodynamic performance indicates excellent results and the system facilitates a minimally invasive approach. This approach is likely to yield additional patient benefits although further studies are required to clarify.

25. Resection of Renal Cell Carcinoma Extending into The Heart: Avoidance of Deep Hypothermic Circulatory Arrest

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Background: The management of primary renal cell carcinoma (RCC) with cavo-atrial tumour/thrombus extension is challenging. Operative resection remains the cornerstone of treatment. Debate exists regarding the optimal surgical strategy. Deep hypothermic circulatory arrest (DHCA) is often used to provide a bloodless surgical field but is associated with significant morbidity and mortality. We explored a simplified approach using low flow cardiopulmonary bypass (CPB) with the heart beating, avoiding DHCA.

Methods: From June 2003 to April 2013, 11 patients with primary RCC extending into the vena cava, right atrium, or both, underwent radical nephrectomy and cavo-atrial thrombectomy. CPB was established with venous drainage from both the superior vena cava and infra-renal IVC (or femoral vein). Once kidney was mobilized, flow was reduced under conditions of moderate hypothermia and the cava and right atrium were opened, with the heart beating, to extract the tumour. Additional procedures included CABG X 3 (n = 1), closure of atrial septal defect (n = 1) and pulmonary embolectomy (n = 1). The mean age of patients was 57 years (range 36–70), 7 were male.

Results: Complete tumour resection was achieved in all cases. Mean CPB time 98 min (67–141 min). In no case was DHCA used. Mean number of blood transfusions was 21 (5–57). In hospital 30-day mortality was 0 %. Mean follow up was 43 months (1–119 months). Survival at 1-year was 70 %. Mean survival 31 months (1–119 months). Survival at 2 and 5-years 37.5 and 20 % respectively. 6 patients are still alive. Of the 5 deceased, 3 died due to recurrent metastatic disease.

Conclusion: RCC with cavo-atrial tumour-thrombus involvement can be simply and safely operated on with the use of adjunct low flow CPB with modest hypothermia. This avoids the deleterious effects of DHCA and is associated with favourable short and long-term survival outcomes.

26. Can Low Volume Adult Congenital Surgery be Delivered Safely in a High Volume Adult Cardiac Surgery Unit?

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Objective: Within the UK there is a review of Adult Congenital Heart Disease Services. This has stem from the Bristol Inquiry, Kennedy Report, Surgery for Children: Delivering a First Class Service by Royal College of Surgeon England and then Safe and Sustainable Review. The recommendation is high volume units performing adult congenital surgery. We feel that we have achieved this result due to our frame work within a small volume unit.

Method: Data was collected prospectively from April 2010 to March 2013. This data was entered into a data base called Heart Suite. Data from our unit was compared to Data from CCAD and SCTS.

Results: Ninety adults were assessed with age ranging from 16 to 75 years and average age of 37 years. There were twenty different operations ranging in different complexity. Each case was risk stratified by STS-EACTS category ranging from category 1 to 4. There was no recorded mortality in this group of patients. This data was validated to up to 2012 by CCAD group. We perform on average about 30 cases per year. When compared the other 26 units performing Adult Congenital Surgery in the UK average number of cases 38.5 with a median of 20.6. From the SCTS Data April 2008 to March 2011 Royal Victoria Hospital has performed 2,534 case (Average 845/yr) and April 2011 to March 2013 approximately over 1000 cases year.

Conclusion: Adult Congenital Cardiac Surgery with low volume can be performed in a high volume Adult Cardiac Surgical Unit safely as demonstrated with our results. Ongoing Clinical governance and Multi-disciplinary approach is vital to our ongoing surgical outcomes.

27. The St Jude Trifecta^{TM} Aortic Valve: Early Clinical Experience from a Single Centre in the West of Ireland

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Objectives: The St. Jude Medical Inc. Trifecta ^{TM} valve is a new stented bio-prosthetic aortic valve designed to have a large effective orifice area with low post-operative echo gradients. We aimed to investigate the outcomes of aortic valve replacement (AVR) using the Trifecta ^{TM} valve in a series of patients in the west of Ireland.

Methods: A longitudinal cohort study was undertaken. Data was obtained from a prospectively-maintained electronic patient record system. We included all patients undergoing AVR utilizing the St. Jude Trifecta^{TM} valve over a period between March 2011 and November 2012. Data was tabulated with respect to patient characteristics, valve size and External Orifice Area Indices (EOAIs) as well as pre- and post-operative echocardiographic parameters. Data was analysed using SPSS v.19.

Results: Thirty-eight patients were included in this series, comprising 27 (71 %) males and 11 (29 %) female patients. The median age of the cohort was 73 years (range 26–87), with no difference between genders. The majority of patients were referred for AVR because of symptomatic or severe asymptomatic Aortic Stenosis (n = 32, 84 %), while 4 (11 %) patients had symptomatic Aortic Regurgitation, and 2 (5 %) had mixed pathology. Two patients were referred for emergent

repair because of infective endocarditis. The median Euroscore in this group was 9. Post-operatively there were significant improvements in both mean (47 ± 19 mmHg –v– 9 ± 4 mmHg, $p < 0.0001$ (paired samples *t* test)) and maximal (74 ± 29 mmHg –v– 17 ± 8 mmHg, $p < 0.0001$) pressure gradients. There was also a significant reduction in pro-BNP levels following surgery ($p = 0.036$, Wilcoxon Signed Rank Test), and in levels of diastolic dysfunction ($p = 0.047$, X^2). The median EOAI achieved was 0.91 (range 0.78–1.26).
Conclusion: The early experience of Trifecta^{TM} aortic valve in our institution is promising, with significant reductions in post-operative pro-BNP levels, pressure gradients and diastolic dysfunction, even in high-risk patients. Long-term results of durability are awaited.

28. Clinical Outcomes of Trans-Catheter Aortic Valve Replacement at a Tertiary Cardiac Centre in Ireland

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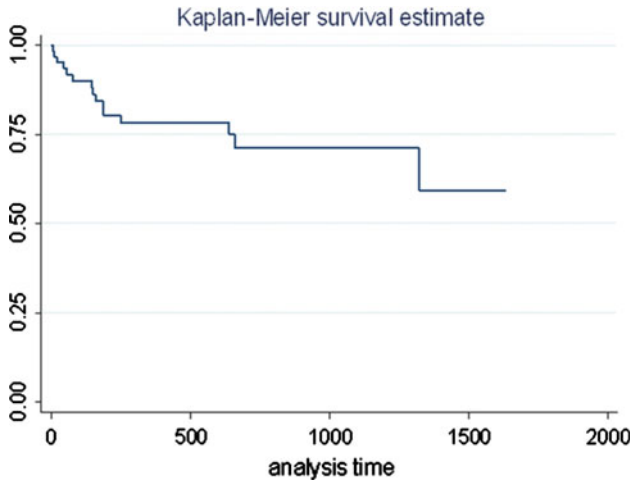
Background: Percutaneous aortic valve replacement (TAVR) is an emerging technology that is approved for the treatment of patients with severe symptomatic aortic stenosis who are at high or prohibitive risk for surgical valve replacement. We sought to assess the clinical outcomes of patients treated with TAVR at our institution.
Methods: All patients undergoing TAVI at the MMUH and MPH hospitals from the initiation of the program in November 2008 to the current date were identified. A prospective TAVI database utilizing the data elements from the STS/ACC TVT registry was established in June 2012 to collect data. For patients treated prior to that date, retrospective review of the medical record was performed to populate the data elements.
Results: A total of 64 patients underwent TAVR, with the majority being male (n = 42. 65 %) The mean age of the cohort was 83±4 years. The majority of patients were treated using the transfemoral route (n = 48, 75 %), using the Edwards Sapien XT valve (n = 62, 97 %). There were a total of 15 deaths and 3 major strokes in the cohort. The Kaplan–Meier estimate for death/major stroke at 1 year was 72 % (CI 56–82 %) (**Figure below**). The permanent pacemaker rate was low (n = 3, 5 %).
Conclusions: The clinical outcomes of TAVR observed at this tertiary cardiac center in Ireland appear reasonable compared to outcomes reported from the PARTNERS trial. Continued refinement of patient selection is required to optimize clinical outcomes and efficient utilization of resources.



29. Atrial Septal Defect And Left Atrial Appendage Closure: A Single Centre Experience

Ryan N, Mc Adam BF, Foley DP

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Background: Transcatheter structural heart interventions for closure of patent foramen ovale, atrial septal defects and left atrial appendage occlusions are routinely carried out under general anaesthesia with a minimum one night hospital stay. The Irish healthcare system is in permanent crisis due to lack of inpatient beds. To increase availability of interventional cardiac procedures, we instigated an ambulant care day case approach to a wide range of interventional cardiac procedures over a number of years.
Objectives: Compare day case transcatheter structural heart procedure complications with published data. Demonstrate the safety of day case procedures.
Methods: Retrospective review of all interventional heart procedures over a fifteen-month period. All procedures are carried out under conscious sedation and local anaesthesia with fluoroscopic guidance and additional transoesophageal ECHO guidance for LAA occlusions and ASD closures.
Results: Of 1446 planned day case cardiac interventions, 45 were for structural heart procedures, 8 PFO, 8 ASD and 29 LAA closures. The procedure was successful in 93.4 % of cases with 15.5 % of patients requiring admission from the cardiology day ward. Two patients were admitted as their procedures finished late in the day. One patient was admitted post septal occlusion device embolization with successful retrieval. Four patients were admitted post LAA occlusion, two with pericardial effusions not requiring drainage, one with femoral haematoma (14F sheath) and one for syncope (postural hypotension). The majority (71.4 %) were discharged the following day. There were no readmissions within 30 days, 2 (4.4 %) patients attended the ED.
Conclusion: Most common transcatheter TOE guided structural heart procedures can be safely planned and carried out as day procedures under conscious sedation. A small minority of patients required admission with the majority being discharged the following day. Our periprocedural complication rate is in keeping with the published literature. A small minority of patients requiring admission, the majority being discharged the following day.

30. Second Generation Left Atrial Occlusion Devices: A Single Centre Experience

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Atrial fibrillation (AF) is associated with up to 33 % of strokes in Ireland. Anticoagulation is the only therapy that has been shown to reduce mortality and stroke risk in patients with AF, however it is estimated that up to 50 % of those who meet criteria for anticoagulation do not receive it.
Percutaneous left atrial appendage occlusion (LAAO) has been shown to be non-inferior to Warfarin therapy in terms of stroke prevention. However adverse event rates relating to implantation, including stroke, thrombus formation and pericardial effusion, have been estimated to occur in up to 4.1 % of implants.
Second generation LAAO devices (Amulet©) are now available. Design features include a longer lobe and larger disc diameters to improve coverage of the appendage and an end-screw that is flush with the device disc to reduce the possibility of device associated thrombus. We report our experience with this second generation device.

To date we have implanted Amulet devices in 8 patients. All had a history of persistent AF. 62.5 % of patients reported a history of bleeding- this occurred on Warfarin in 60 %, and on a novel oral anticoagulant in 40 %.

	Patient Characteristics (N = 8)
Age, years (mean, range)	65.4 (49–78)
Male (%)	75
CHADSVacs Score (mean)	2.1
HAS-BLED Score (mean)	2.2

Median size of device implanted was 24 mm (22–31 range). Four procedures were done in conjunction with a pulmonary vein isolation. One was done in conjunction with an atrial septal defect closure, one with an ICD box change. Two were individual procedures. Mean radiation screening time was 24.7 min.
All devices were successfully implanted. No acute peri-procedural complications were recorded. 50 % of patients have had a transoesophageal echocardiogram since LAAO implantation- with no thrombus or significant residual left atrial appendage flow identified.
Conclusion: In this small series, left atrial appendage occlusion with Amulet devices is shown to be effective with an excellent safety profile.

31. Prevalence of Pacemaker Requirement Post Medtronic Corevalve® Implantation

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Introduction: Pacemaker requirement is a known complication of Transcatheter Aortic Valve Implantation (TAVI), the incidence of which is reportedly higher with CoreValve® implantation. We sought to assess the prevalence of pacemaker requirement at our centre, the utilisation of pacing and examine predictors pacemaker requirement.
Methods: Our TAVI database was analysed and data obtained on patients who required pacemaker implantation post-CoreValve® implant, and a randomly selected group of patients who did not require a pacemaker.
Results: In total 44 patients received a pacemaker post-CoreValve®. Overall 30-day post procedure pacemaker rate was 27.8 %, this decreased from 28.5 % to 22.6 % between 2008–2012. Implanted pacemakers on average utilised atrial pacing 27.5 % and ventricular pacing 86.7 %. Predictors included degree of valve calcification, length of PR and QRS interval, AV block intra-procedurally and depth of CoreValve® (**Table 1**). There was no significant difference in one-year mortality between the two groups (p = 0.550).

Table 1 Characteristics of pacemaker and non-pacemaker CoreValve® patients

	Non-pacemaker (n=43)	Pacemaker (n=44)	Level of significance
Age	81.0±7.4	80.5±6.7	p=0.765
Male(%)	17(39.5)	23(52.3)	p=0.786
Aortic valve area	0.76±0.45	0.70±0.55	p=0.487
Corevalve size			
• 23	1(2.3)	0(0)	p=0.220
• 26	11(25.6)	21(44.7)	
• 29	22(51.2)	18(38.3)	
• 31	9(20.9)	8(17.0)	
Annulus:valve size ratio	1.20±0.90	1.17±0.81	p=0.108
Grading of AV calcification(%)	17(39.5%)	8(18.2)	
• **1**	18(41.9%)	20(45.5%)	
• **2**	8(18.6%)	16 36.4)	
• **3**			**p=0.056**
Pre-op rhythm(%)			
• **Sinus**	32(74.4)	26(59.1)	p=0.260
• **Atrial fib/flutter**	11(25.6)	18 40.1)	
Valve Depth	5.6	7.0	**p=0.020**
Pre-op PR interval	106.0 ± 23.2	197.3 ± 11.3	**p=0.000**
Pre-op LAD	1(2.3)	8(17.0)	**p=0.032**
Pre-op BBB(%)			
• **RBBB**	8(18.6)	11(25)	p=0.233
• **LBBB**	8(18.6)	4(9.1)	p=0.220
Pre-op QRS interval	99.3 ± 18.5	115.0 ± 25.4	**p=0.001**
New LBBB	23(53.5)	17(39.5)	p=0.152
AV block intra-procedurally	0(0)	10(22.7)	**p=0.003**

Conclusions: Belfast pacemaker implant rate post-TAVI is comparable with other international centres. Rate of pacemaker implant are falling possibly due to improvements in technique and patient selection.

32. Audit of Safety and Efficacy Outcomes of Patients Undergoing Left Atrial Box Isolation for Atrial Fibrillation

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Background: Isolation of the pulmonary veins alone (PVI) is associated with a 50–70 % clinical success rate in paroxysmal atrial fibrillation but is significantly lower for persistent atrial fibrillation. More comprehensive ablative strategies have evolved that may offer higher success rates. Posterior left atrial box isolation is one such technique for which there is only limited and conflicting data with regard to its safety and efficacy.
Methods: We performed an audit of 100 patients undergoing LA box isolation over the last 4 years. Recurrence of arrhythmia was detected by evaluating symptoms and continuous 24 h ECG monitoring at 2, 6 and 12 months post procedure.
Results: The average age of the group was 55.6 ± 9.5 years. Average duration of atrial fibrillation was 5.4 ± 5.2 years. Persistent atrial fibrillation was present in 71 %. Left atrial enlargement was documented in 43. All had been on at least one anti arrhythmic medication. Patients underwent circumferential PVI plus linear posterior LA lines to complete box isolation. Complete LA box isolation was achieved in 99 %. At a mean follow up of 11.2 ± 5.1 months 73 patients were free from atrial fibrillation. 53 % were taking no anti arrhythmic

medication. Five of this group developed clinically significant atrial flutter. Twenty-six patients had recurrence of atrial fibrillation, 72 % of which had previous persistent AF. Recurrence was paroxysmal in 61.5 %. Fifteen patients underwent repeat procedures. There were no adverse events relating to the procedure.
Conclusion: This provisional data on clinical efficacy and safety from a single series would suggest that a strategy of left atrial box isolation is worthy of further evaluation in a multicentre registry.

33.Why Do Patients With Bicuspid Aortic Valve Undergo Surgery?

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Purpose: To determine the indications for surgical intervention in patients with bicuspid aortic valves (BAV) at a tertiary centre and to document the short term outcomes of such interventions.
Methods: A retrospective review of (i) our adult congenital heart database and (ii) patients with a diagnosis of BAV who were referred to a tertiary cardiology and cardiothoracic centre between 2000–2012.
Results: To date 613 patients with a diagnosis of BAV have been identified. Of these, 47.5 % had surgery, at a mean age of 52.9 years (±19.1 years). The commonest primary indication for surgery was aortic stenosis (AS, 53 %). Other primary indications for surgical intervention included aortic root dilatation (13 %), aortic regurgitation (8.3 %), endocarditis (5 %), mixed aortic valve (3.4 %) and aortic dissection (0.4 %). 30 day mortality following surgical intervention was 0.9 %. Total survival was 95.1 % at a mean follow up of 2.79 years. Of the survivors, 4.6 % required a re-do procedure during follow up. The commonest indication for a re-do procedure was aortic regurgitation- accounting for 36.8 % of such procedures.

Patient Characteristics	BAV Patients who underwent surgical intervention (mean, SD)
Age (years)	47.6 (17.8)
Male (%)	69.9
Hypertension (%)	28.1
Prior history of aortic valvuloplasty/valvotomy in childhood (%)	4.6
Prior diagnosis of aortic coarctation (%)	19.3

Conclusions: Patients with congenitally bicuspid aortic valves referred to tertiary centres have a high rate of surgical intervention. The commonest indication for intervention is aortic stenosis. 30 day mortality rates and need for re-do surgical intervention were low in our series.

34. Is Post-Mortem Evaluation of Cardiac Rhythm Management Devices Useful?

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Introduction: The number of implanted cardiac rhythm devices is increasing. Overall little data exists on the rate, feasibility and information garnered from device interrogation post mortem.
The aim of the study was to investigate whether device interrogation provided additional information for the pathologist and whether device function was normal.
Methods: Devices were explanted from 32 consecutive post mortem, between 2008 and 2011, and were interrogated. Interrogation and interpretation of the device data was performed blinded to the post-mortem findings. Battery voltage, charge time, lead impedances, thresholds and intrinsic amplitude measurements were recorded. Data related to potential arrhythmias was also recorded, as was pacemaker dependency, defined as pacing >80 %. After data collation the investigators jointly decided as to the value of the interrogation on a case by case basis.
Results: 24 pacemakers and 8 ICD's were studied. The mean age of patients at time of death was 75 (range 31.8–95) years and the device had been implanted for a mean of 3.2 (range 0–9.6) years.
There was an advisory on 3 ICDs and 1 ICD lead but they demonstrated normal function.
Device measurements were normal for all devices.
High ventricular rates were recorded in 9/24 cases, three occurring on the date of death. Device data and cause of death concurred in 9 cases. It was discordant in 4 cases, 3 of these devices did not have EGM storage capability and reported cause of death was fatal arrhythmia. In the fourth no high rates were recorded although a VF arrest was documented.
2/8 ICD interrogations concurred with cause of death. However 3 were discordant, interrogation revealing no arrhythmia, reported cause of death being fatal arrhythmia, suggesting asystole or PEA as the potential fatal arrhythmia.
Conclusion: Post-mortem device interrogation is feasible, providing additional information in 14/32 cases with concordance with cause of death in 11/32.

35. Implantable Cardioverter-Defibrillators in Heart Transplant Recipients: A Single Centre Experience

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Purpose: Graft vasculopathy with or without left ventricular dysfunction may act as a substrate for arrhythmic death in patients following remote orthotopic heart transplant (OHT). The role of implantable cardioverter-defibrillators (ICD) for the prevention of sudden cardiac death (SCD) in these patients is unclear. We examined the use of ICDs in adult OHT recipients in a single transplant centre.
Methods: We analysed the records of OHT recipients who had an ICD implanted. Details on patient demographics, time from OHT, indication for ICD, presence and severity of graft vasculopathy, left ventricular ejection fraction (LVEF), device therapy delivered and complications associated with ICD insertion were collected.
Results: A total of 296 transplants were performed from 1985 to 2012, of whom 9 (3.3 %) had an ICD implanted post transplant. Of ICD recipients, the average age at transplant was 39 years (±14.2 years), and 7/9 (77 %) were male. Mean time from OHT to ICD was 16 ± 6 years. Defibrillation threshold testing (DFT) was performed in 6/9 (66.6 %). The indications for ICD implantation were as follows: severe graft vasculopathy in 5, LV dysfunction with moderate graft vasculopathy in 1, sustained ventricular tachycardia in 2 and moderate graft vasculopathy with high grade AV block on exertion in 1. Two patients had experienced syncopal episodes. In those with severe graft

vasculopathy the average LVEF was 57 % (±7 %). The average follow-up after device implant was 10 months (±7 months). One patient had successful anti-tachycardia pacing (ATP) for ventricular tachycardia 13 months post implant. One patient died of SCD (DFT tested after implant) and subsequent device interrogation revealed ventricular fibrillation followed by electromechanical dissociation. To date there have been no complications associated with ICD insertion.
Conclusions: The use of ICDs for the prevention of SCD in patients with remote OHT remains unproven and the subject of ongoing analysis. Routine testing of DFTs at the time of implantation in patients may not be appropriate

36. Cost-Effective Bridging to Cardiac Transplantation: A Future For Ventricular Assist Devices?

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Background: Because of improved heart failure treatments, the profile of patients listed for cardiac transplantation has changed significantly over the past 2 decades. Specifically patients have more advanced disease, greater degrees of renal impairment and pulmonary hypertension, and a higher dependence on continuous inotropic therapy or other forms of ventricular support. Concomitantly, technologic advances have greatly improved outcomes of ventricular assist devices (VAD) as bridges to transplantation (BTT). Accordingly, early VAD implantation may be more cost effective than a default strategy of support with inotropes or intra-aortic balloon counter-pulsation (IABP).
Aim: To determine the hospital cost of bridging patients to cardiac transplantation by continuous inotrope infusion ± IABP.
Methods: Two representative patients were selected, one inotrope-dependent, the other on IABP. Detailed cost analysis was performed, including length of stay (LOS) prior to transplant, bed-day costs, costs of peripherally inserted central catheters and of IABP. Patients supported to transplant in hospital on inotrope/IABP 2006–2013 identified from transplant database together with their pre-transplant LOS.
Results: Total cost patient 1 (IABP, LOS 370 days): €565,960. Total cost patient 2 (inotrope, LOS 292 days): €380,750. Between 2006 and 2013, 15 patients were supported predominantly with IABP, mean 98 days (14–390), 66 % male, mean age 45 (16–65); 14 patients were supported predominantly with inotropes, mean 178 days (34–400), 90 % male, mean age 43 (17–54); 2 patients were supported with both consecutively (inotrope then IABP) (182 days + 31 days and 64 days + 30 days respectively).
Nine patients (29 %) eventually underwent VAD implantation as BTT (mean time to VAD = 86 days (20–400)). Twenty of these patients (67 %) transplanted to date; 5 (16 %) have died awaiting transplantation. Total cost of bridging to transplant or VAD for this cohort = €5,366,400.
Conclusion: Bridging inotrope or balloon-pump dependent patients to transplantation is expensive, warranting exploration of alternative strategies. For patients dependent on IABP, comprising more than 50 % of this cohort, a default strategy of early VAD implantation may prove cost effective.

37. An Audit of the Prescription of Clopidogrel with Reference to Duration of Therapy and Instructions for Use

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Introduction: Clopidogrel is a commonly prescribed anti-platelet agent. Its indications include coronary artery disease, post-stent insertion, peripheral vascular disease and prophylaxis post-cerebrovascular accident (CVA). Clear guidelines on the optimum duration of clopidogrel therapy are scarce. NHS guidelines advise a maximum 12 months prescription following acute coronary syndrome (ACS) or stent insertion. These guidelines also state that clear instructions be given to the primary care team at the time of initial prescribing.
Purpose: To determine how long patients have been on clopidogrel, and if this is in accordance with current recommendations whether clear instructions were given at the time of initial prescribing as to duration of therapy and if patients were reviewed if instructions were adhered to.
Methods: An audit of 50 patients in a general practice setting who had been prescribed clopidogrel in the three year period, January 2010 to January 2013. Data were obtained through the patients' files using the patient information programme Socrates.
Results: 76 % of all patients were prescribed clopidogrel for ACS ± stenting with 92 % of these remaining on clopidogrel for over 1 year, 63 % for over 2 years and 13 % for over 5 years.
48 % of all patients on clopidogrel had no clear instructions regarding duration of therapy at time of initial prescription. In 18 % there was no record of initial discharge letter/prescribing note.
28 % of all patients on clopidogrel had further instructions from outpatient reviews regarding duration of clopidogrel therapy.
Cardiology and GP services did not adhere to prescribing instructions in 20 % and 16 % of patients respectively.
Conclusion: This audit highlights the variability of duration of clopidogrel therapy and the need for clear prescribing instructions, better reviews of patients on this drug, better inter-doctor communication and better prescribing guidelines.

Session: Young Investigator Award

38. Restoration of Platelet Function with Platelet Transfusion in Acute Coronary Syndrome and Cardiac Surgery Patients on Dual Antiplatelet Therapy-the APTITUDE Study

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Background: The *APTITUDE* study was designed to demonstrate the effect on restoration of platelet function of ex vivo (APTITUDE ACS/PCI) and in vivo (APTITUDE BLEED) platelet transfusion (PT) in a coronary populations treated with $P2Y_{12}$ receptor antagonists.
Methods: In the APTITUDE ACS/PCI study, patients presenting with ACS or for elective PCI, receiving a loading doses (LD) of one of clopidogrel, prasugrel or ticagrelor were included. Platelet transfusion (PT) was performed ex vivo by mixing platelet rich plasma (PRP) from blood sampling performed before administration of LD in increasing proportions with PRP sampled 4 h after LD. Light transmission aggregometry (LTA) measuring residual platelet aggregation (RPA) in response to 20 μmol/L adenosine diphosphate was assessed. In the APTITUDE BLEED study, platelet function using several laboratory techniques was assessed before and after in vivo PT administered for excessive bleeding in patients undergoing cardiac surgery treated with maintenance dose $P2Y_{12}$ receptor antagonists.
Results: A total of 45 patients (76 % male, 50 % ACS) were included in the APTITUDE ACS/PCI study including n = 13 clopidogrel 600 mg, n = 12 clopidogrel 900 mg, n = 10 prasugrel 60 mg and

n = 10 ticagrelor 180 mg. The % restoration of platelet function achieved with 80 % proportion PT (RPA 80 % PT mix/RPA Baseline x 100) significantly decreased with increasing potency of $P2Y_{12}$ inhibitor (83.9 ± 11 %, 73 ± 14 %, 66.3 ± 15 %, 40.9 ± 19 % respectively; p for trend <0.0001). In APTITUDE BLEED, a total of 54 patients (67 % male) treated with aspirin and either clopidogrel (n = 45), prasugrel (n = 6) or ticagrelor (n = 3) were included. Compared to baseline there was a significant increase in platelet activation, as assessed by vasodilator-stimulated phosphoprotein platelet reactivity index (VASP-PRI) (42.1 ± 23.3 vs 53.3 ± 19.4 %; p < 0.0001) (Figure 2).

Conclusions: Platelet transfusion appears to lead a significant restoration of platelet reactivity in patients treated by $P2Y_{12}$ receptor antagonists but has less efficacy with more potent agents.

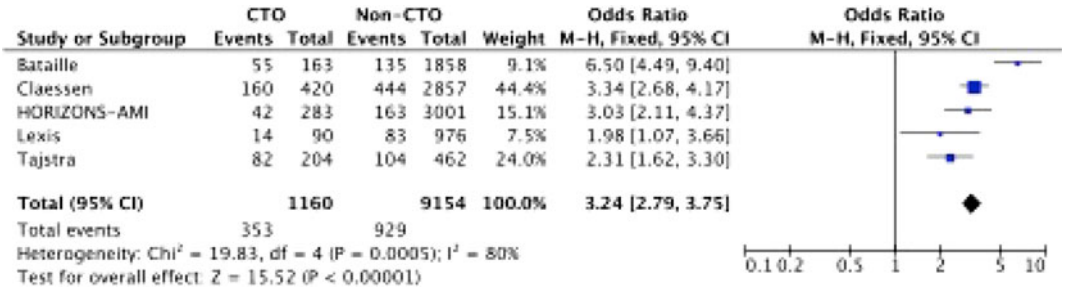


Fig. 1 Platelet aggregation as assessed by light transmission aggregometry demonstrating baseline values before loading close (LD), 4 hours post LD and after platelet transfusion ex vivo with platelet rich plasma (PRP) from baseline in ascending proportions

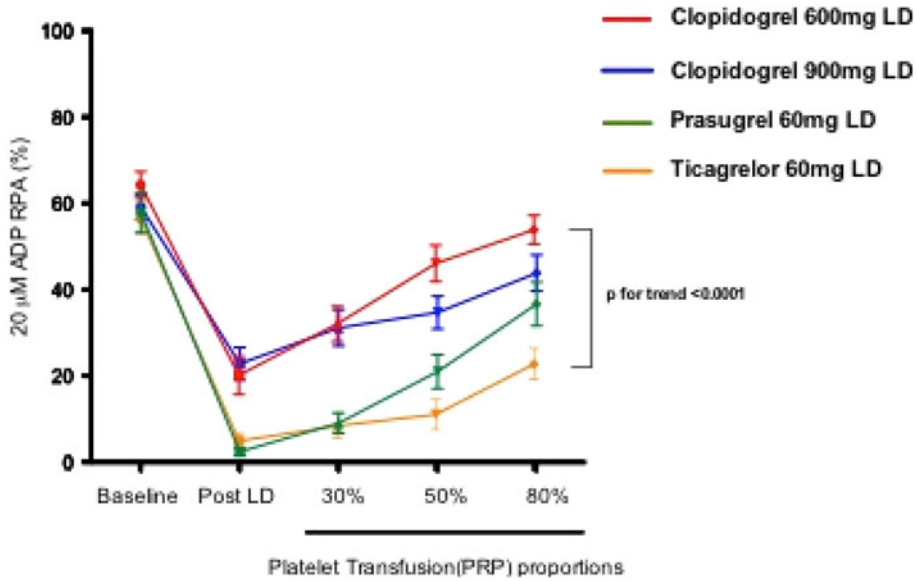
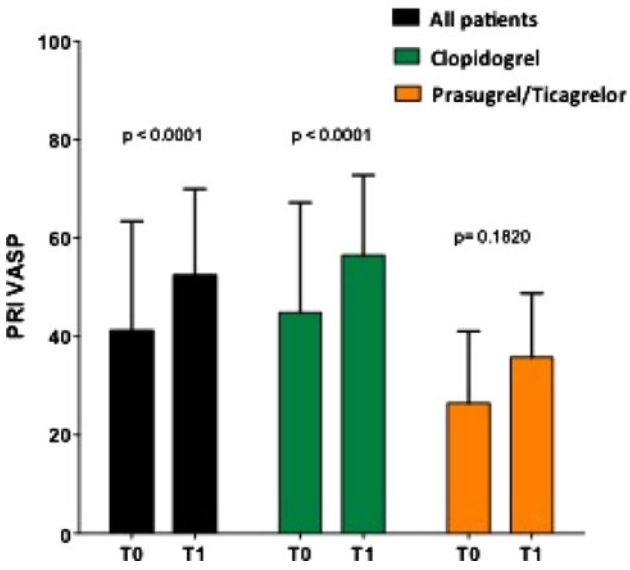


Fig. 2 Platelet activation as assessed by vasodilator-stimulated phosphoprotein platelet reactivity index (VASP PRI %) measured before (T0) and after (T1) platelet transfusion according to P2Y12 inhibitor



39. Dynamic Surface ECG Markers of Arrhythmogenic Right Ventricular Cardiomyopathy Patients Undergoing Electrophysiology Studies

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Background: Early (or concealed) ARVC disease has increased predisposition to arrhythmias and SCD. Understanding and aiding detection of concealed ARVC may help reduce this predisposition.
Aim: To examine how the myocardium in concealed ARVC disease behaves under the stress of imposed rapid and controlled heart rates by the analyse of surface ECG parameters in EPS. Furthermore, to observe if these ECG parameters differ from RVOT and controls.
Methods: 44 patients (22 ARVC—without evidence of right ventricular myocardial disease, 9 RVOT, 13 Normal Controls) underwent EPS with standardised pacing protocol involving S1 and S2 beats. The follow ECG parameters were compared for S1 and S2 imposed beats; QRS duration, T wave Duration (TWD), Latency Period Duration (LPD), T wave peak to T wave end duration (Tpe) and QT interval.
Results: Multivariate analysis identified significant differences in the dynamic ECG parameters of the three groups ($p = 0.008$). For S1 beat; ARVC and RVOT patients had a statistically significantly longer TWD when compared to controls (193.3 ms, 201.6 ms and 174.6 ms respectively, $p = 0.005$); as was Tpe duration (96.9 ms, 102.3 ms and 86.9 ms, respectively, $p = 0.007$). Post hoc confirmed differences between ARVC vs Controls (TWD difference = 18.8 ms $p = 0.019$, Tpe difference = 10.1 ms $p = 0.0029$) and RVOT vs Controls (TWD difference = 27.0 ms, $p = 0.005$, Tpe difference = 15.46 ms, $p = 0.005$). The LPD of the S2 beat was statistically different in all groups (54.63 ms—Controls, 54.67 ms—RVOT, 72.30 ms—ARVC, $p = 0.002$). Discriminate analysis enabled 66.7 % to be classified successfully (80 % ARVC, 69.2 % Normal, 33.3 % RVOT).
Conclusion: Dynamic surface ECG changes occurred during EPS in concealed ARVC disease. These dynamic changes enabled differentiation of concealed ARVC from RVOT and normal myocardium. Addition analysis suggests early ARVC may mimic RVOT.

40. The Effect of Multiple Micronutrient Supplementation in Patients with Chronic Stable Heart Failure: A Randomized, Placebo-Controlled Trial

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Background: The aim of this study was to investigate the effect of a multiple micronutrient supplement (including vitamin D (50 mcg/d)) in patients with chronic stable heart failure (CHF).
Materials and Methods: This was a double-blind, placebo-controlled randomized trial. Seventy-nine patients on optimal treatment for CHF (left ventricular ejection fraction (LVEF) $\leq$45 %) were randomized to receive a multiple micronutrient supplement or placebo. Endpoints were assessed at baseline and after 12 months. The primary endpoint was LVEF, assessed using cardiac magnetic resonance imaging or 3-dimensional echocardiography. The secondary endpoints were as follows: quality of life (Minnesota Living With Heart Failure Questionnaire), physical functioning (6-minute walk test distance), blood levels of N-terminal prohormone of brain natriuretic peptide and markers of systemic inflammation (C-reactive protein, tumour necrosis factor-alpha, interleukin-6, interleukin-10), and levels of oxidative stress (urinary 8-iso-prostaglandin F2 alpha). Compliance was assessed by measuring blood levels of vitamin D and B6.
Results: Treatment with a multiple micronutrient supplement had no significant effect on LVEF or any of the secondary endpoints. The results for the primary endpoint and the blood levels of vitamin D and B6 are summarized in the Table.

		n	Baseline	12 Month	p
LVEF	Active	33	38.9 (11.1)	38.6 (10.9)	0.441
	Placebo	35	44.7 (8.8)	44.9 (12.0)	
Vitamin D	Active	34	38.7 (13.8)	99.6 (23.8)	<0.001
	Placebo	36	38.6 (23.7)	35.3 (22.0)	
Vitamin B6	Active	35	56.4 (34.4)	106.9 (59.1)	<0.001
	Placebo	36	57.3 (26.6)	52.1 (27.0)	

Results are presented as mean (standard deviation), p: significance of difference between treatment groups (analysis of covariance).

Discussion: Despite evidence of good compliance with the intervention in this group of patients with CHF, micronutrient supplementation did not result in any significant changes in the primary or secondary endpoints.

41. Circulating Endothelial Cell Enriched Gene Expression Analysis in Acute Myocardial Infarction

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Background: Circulating endothelial cells (CECs) that line the coronary artery endothelium are sloughed off during atherosclerotic plaque rupture preceding myocardial infarction (MI). Comparison of gene expression levels in these cells between those experiencing an MI and healthy controls may determine the genes associated with the deleterious CECs released during coronary artery atherosclerotic plaque rupture.
Methods: Blood was collected from 21 MI patients and 22 age-matched healthy donors. CECs were isolated using the CellSearch system with the CellSearch CEC Profile kit. The total RNAs were isolated from CECs according to standard Trizol method. 50 ng total RNA was first converted to labeled target cDNA using the Ovation RNA Amplification System V2. Subsequently, 3.75 μg of the purified cDNA underwent a two-step fragmentation and labeling process using the Encore Biotin Module. Targets were hybridized to Affymetrix human U133 Plus 2.0 array. Following hybridization, arrays are washed and stained before scanning on the Affymetrix GeneChip Scanner and data extracted using Expression Console. Using the first 12 myocardial infarction subjects and 13 healthy age matched controls a database containing a training collection of approximately 54,000 expression patterns was created. Principal components (PC)

analyses of the CEC gene expression profiles were used to discriminate myocardial infarction subjects from healthy controls. Estimation of classification performance was then carried out in an independent set of 9 myocardial infarction patients and 9 healthy controls.

Results: Principal component 1 accurately classified an independent collection of 9 MI's and 9 healthy controls. The area under the receiver-operating characteristic (ROC) curve for the classifier developed from the PC1 analysis was 0.9.

Conclusions: Gene expression profiles isolated from CECs accurately discriminate MI patients from healthy controls. This molecular signature may be useful for developing an assay for identifying atherosclerotic plaque rupture preceding myocardial infarction.

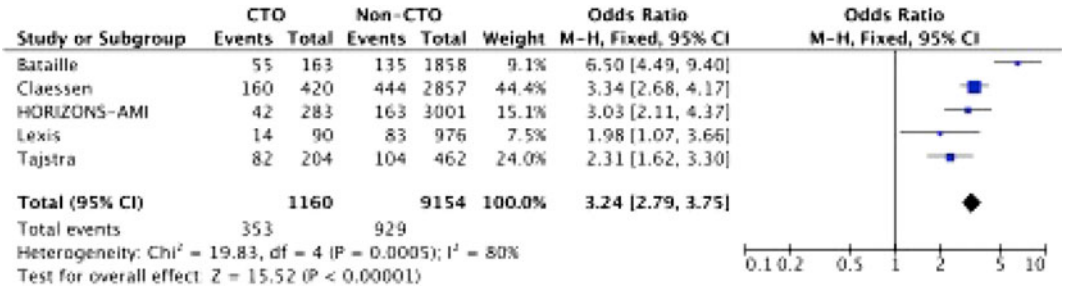

Fig. 1

Session: Revascularisation

42. Association of Non-Infarct Related Artery Coronary Chronic Total Occlusion with Mortality in Patients Presenting with ST-Elevation Myocardial Infarction: A Systematic Review and Meta-Analysis

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Purpose: To evaluate the impact of the presence of a chronic total occlusion (CTO) on short and long term mortality after primary percutaneous coronary intervention (PPCI).

Methods: We performed MEDLINE, Cochrane Controlled Trials Registry and EMBASE database searches for published articles using predefined terms. Studies that reported data on the incidence of all-cause mortality in STEMI patients with single- or multivessel disease (SVD, MVD) with and without CTO were included. Of the 189 studies identified, 5 articles met the inclusion criteria: 3 observational studies and 2 post hoc analyses of randomized controlled trials (RCTs).

Results: A total of 10,314 patients were included in the meta-analysis with 4350 patients from observational analyses of RCTs, 5964 patients in observational studies with overall 1160 (11 %) patients with CTO. The global analysis demonstrated that CTO was associated with an over threefold increased incidence of mortality at a median follow up of 36 months compared to patients non-CTO patients (30.4 % vs 10.1 % OR: 3.24; 95 % confidence interval [CI]: 2.79 to 3.75; p 0.0001) (Figure 1). This finding was consistent in a sub-analysis of studies that reported 30-day follows up (17.6 vs 4.2 % OR: 4.3; 95 % CI: 3.4 to 5.4 $p = 0.001$). Cardiac mortality and MACE were also higher in patients with CTO (14.7 vs 3.7 % OR: 4.42; 95 % confidence interval [CI]: 3.18–6.15; $p < 0.0001$ and 33.5 % vs 20.4 % OR: 1.97; 95 % confidence interval [CI]: 1.56–2.47; $p < 0.0001$ respectively).

Conclusions: Coronary chronic total occlusion in the non culprit artery in patients presenting with STEMI is associated with poor long-term mortality. Prospective randomized studies that examine the impact on clinical outcome of revascularization strategies in this population are indicated.

43. Appropriateness of Helicopter Transfer for Primary Percutaneous Intervention in a National Acute Coronary Syndrome Programme.

Colleran R, McInerney A, Mulveen V, Daly K

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Introduction: The National ACS Programme advocates transfer of STEMI patients from the field, or from outside hospitals (OSH) directly to the catheterisation lab of primary PCI centres, bypassing the ED, if feasible within 90 min of diagnosis, with target diagnosis to reperfusion time less than 120 min, and an acceptable rate of inappropriate cath lab activation of 15 %. We are currently experiencing a surge in helicopter transfer of such patients.

Aims: The aim of this study was to determine the appropriateness of helicopter transfer of STEMI patients for pPCI, in terms of success rates in prehospital diagnosis and in achieving target times.

Methods: Paramedic documentation and electrocardiograms of all patients transferred directly to the catheterisation lab for pPCI by helicopter over a 7 month period were reviewed.

Results: There were 51 helicopter transfers to the cath lab, 39 (76.5 %) from the field, 12 (23.5 %) from OSHs. 31 (79.5 %) field STEMI diagnoses were correct. Of these, 30 had pPCI. 17 (56.7 %) landed within 90 min of diagnosis (mean 91, SD 31.7 min), 12 (40 %) reached the lab within 90 min (mean 111, SD 31.8 min). 13 (43 %) were reperfused within 120 min (mean 135, SD 36.8 min). There were 5 helicopter transfers from OSHs for pPCI. 1 (20 %) achieved target arrival and reperfusion times. Mean diagnosis to landing, cath lab admission and reperfusion times were 135 (SD 51.8), 149 (SD 65.9) and 174 (SD 66.0) minutes respectively. For the remaining 4 cases (80 %), helicopter transfer delayed reperfusion therapy as no patient had a contraindication to thrombolysis at OSH.

Conclusion: Among field transfers, prehospital diagnosis rate was suboptimal but acceptable at this early stage of the programme. Overall rates in achieving target times were also suboptimal, with helicopter transfer sometimes causing unnecessary treatment delays. Helicopter transfer for pPCI should utilised only if anticipated ECG to

pPCI centre door time is less than 90 min. Otherwise, immediate thrombolysis should be considered prior to transfer.

44. Continuous Quality Improvement in the National ACS Programme, The West of Ireland Experience to Date.

Colleran R, McInerney A, Mulveen V, Walsh R, Sharif F, Nash P, MacNeill B, Crowley J, Daly K

University College Hospital, Galway, Ireland

Introduction: The national ACS programme was implemented in 2012 to improve and standardise care of STEMI patients. Goals include (i) primary PCI in 80 % of STEMIs, (ii) increased prehospital diagnosis, (iii) diagnosis to door time <90 min and reperfusion time <120 min, (iv) bypassing non-PCI centres if expected times within target, (v) immediate transfer of thrombolysed patients to designated PCI-centre with early angiography, (vi) early repatriation to non-PCI hospitals, and (vii) length of stay (LOS) <4 days.
Aim: The aim of this study was to measure performance at our institution against these key performance indicators (KPIs).
Methods: Performance in the first 6 months of the programme was compared with that in the preceding 6 months.
Results:
Primary PCI
97 STEMI patients were admitted to our institution in the first 6 months of the programme versus 77 in the preceding 6 months. 78 (80.4 %) versus 49 (60.63 %) patients had pPCI respectively, ($p = 0.01$). 37 (38.1 %) versus 10 (12.9 %) were diagnosed prehospital with direct cath lab transfer, ($p = 0.001$). 20 (20.6 %) versus 1 (1.3 %) bypassed a non-PCI hospital, ($p = 0.002$). ECG to door time was <90 min in 67.7 % versus 74.1 %, ($p = 0.05$). ECG to RT was <120 min in 53.6 % versus 64.3 %, ($p = 0.27$).
Thrombolysis
12 (12.4 %) versus 15 (19.5 %) had thrombolysis ($p = 0.84$), with immediate PCI-centre transfer in 11 (91.6 %) versus 13 (86.6 %), ($p = 0.55$). 4 (33.3 %) and 7 (46.6 %) required rescue PCI respectively. Of the remainder, 5 of 7 (71.4 %) versus 3 of 6 (50 %) had an angiogram within 24 h of thrombolysis, ($p = 0.21$).
Repatriation/LOS
30.9 % versus 14.3 % were repatriated to a non-PCI hospital, ($p = 0.01$). 55.8 % versus 58.6 % had a LOS of 4 days or less, ($p = 0.15$).
Conclusion: Implementation of the ACS programme significantly improved performance in all areas but target times and LOS. More emphasis needs to be placed on these areas with serial assessment of KPIs to ensure continuous quality improvement.

45. Retrograde Autologous Prime: Is There an Association Between Improved Haemoglobin Content During Adult Cardiac Surgery?

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Introduction: As a major blood consumer speciality, the risk of blood transfusion in cardiac surgery are studied and known. An Article by Murphy et al., showed no benefit from transfusion for haemoglobins as low as 70 g/l and the risk of death within 30 days, 6 times higher in those who were transfused following cardiac surgery. RAP (Retrograde Autologous Prime) is a method of priming both the arterial and venous line with the patient's own blood to reduce haemodilution and reduce the likelihood of transfusion both intra and post operatively.
Methods: From July 2012 to October 2012, patients were prospectively studied following either Retrograde Autologous Priming (RAP) (study group) versus Non Retrograde Autologous Priming (NonRAP) (control group). All data was prospectively collected and included age, sex, logistic euroscore, procedure, co-morbidities, haemoglobin and hematocrit pre-op, on pump and post op day 0,1,2 and 5. All patients were followed up until discharge.
Results: A total of 46 patients were looked at over the 3 month period. The demographics of the two groups are highlighted in table 1. Transfusion rates were observed in the two groups of patients. In the study group 30.4 % of patients received blood transfusion and in the control group the rate was 60.9 %.

Table 1. Study Demographics

	Study Group (RAP)	Control Group (NonRAP)
Age (median)	68 (range 50–82)	67 (range 55–83)
Log Euroscore (mean)	4 (range 0.88–15.03)	6.9 (range 0.88–38.32)
Median	5	3.75
Ejection Fraction		18, 4, 1
(Good, Fair, Poor)		
Diabetic patients (insulin dep)	8 (2)	5 (0)
Percentage elective	65 %	70 %
CPB time (mean)	123 (range 44–385)	135 (range 70–239)
Cross-clamp time (mean)	86 (range 26–290)	102 (range 42–194)
Percentage of CABG only	60.7 %	47.8 %

Conclusion: This audit highlight's RAP as an important method in blood conservation following cardiac surgery.

46. Optical Coherence Tomography in the Days Following Primary PCI; Sobering Findings

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Background: Primary coronary intervention (PPCI) is the gold standard for reperfusion in ST elevation myocardial infarction (STEMI). A National PPCI strategy has recently been rolled out nationwide with direct ambulance transfer of STEMI patients to PPCI centres. Optimal stent result is key to achieving best outcomes with PPCI, however patients with STEMIs are a challenging and high-risk heterogenous group. The Dutch Stent Thrombosis Registry has identified undersizing of stents, uncovered dissections and disease distal and proximal to the stent as major predictors of stent thrombosis. These features are all remediable by optimal stenting but not easily detectable by angiography. Optical Coherence Tomography may be useful in identifying these features however it is not universally available in PPCI centres.

Aim: Review the findings and implications of OCT during early relook coronary angiography post PPCI.
Methods: The Cardiac Intervention Suite register for the period January 2012 to March 2013 was reviewed along with electronic procedure records.
Results: Between January 2012 to March 2013, 80 patients had OCT of whom 13 had a recent PPCI. The average age of the patients was 56.9 years, 7 were male. One did not have stenting during PPCI. The culprit artery was the LAD in 46.1 % and RCA in 38.4 %. OCT of the culprit artery showed significant stent undersizing and malapposition requiring optimization in 84 % of cases, with significant distal disease in 53.8 % and significant proximal disease in 23 %. In one case a large edge dissection of the stent was identified. Varying degrees of organized thrombus were identified in most cases.
Conclusion: Culprit artery OCT carried out 2–4 days post successful PPCI in a consecutive unselected patient series revealed stent undersizing, malapposition and additional significant unstented coronary disease in the majority of patients. These findings raise concerns regarding methods of stent sizing and postdilatation during PPCI and suggest we are consistently too conservative. OCT should be available in all PPCI centres and should be considered during PPCI or electively in the succeeding days.

47. Pre-Hospital Diagnosis of STEMI: Is Electronic Electrocardiogram Transmission Superior to Paramedic Catheterisation Lab Activation

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Introduction: Prehospital STEMI diagnosis with direct cardiac catheterisation lab transfer, with an emergency department bypass strategy, significantly reduces door to balloon (DTB) time in primary percutaneous intervention (pPCI). Prehospital diagnosis may be made by paramedics in the field or by a physician via electronic ECG transmission to a hospital-based computer or smart phone. At present, despite a national acute coronary syndrome programme, electronic ECG transmission is possible in only some ambulances in the west of Ireland, and national implementation of such a system would be costly.
Aims: The aims of this study were to investigate whether electronic ECG transmission, reduced the rate of inappropriate cardiac catheterisation lab activation in the west of Ireland, and to determine whether prior ECG transmission improved DTB time in these patients.
Methods: All patients transferred by ambulance directly to the cath lab as a 'Code STEMI' over a fifteen month period were included. Transmitted ECGs on the LIFENET® system were matched with corresponding patients.
Results: In total, 76 patients were transferred directly from ambulance to cath lab with a prehospital diagnosis of STEMI. 46 (60.5 %) had prior ECGs transmission. Of these, there were 6 (13.0 %) inappropriate referrals versus 7 (23.3 %) in the 30 patients without ECG transmission ($p = 0.09$). The mean door to balloon time for those with transmitted ECGs was 42.9 min versus 41.0 for those without ($p = 0.76$).
Conclusion: ECG transmission did not significantly reduce the rate of inappropriate cath lab activation. Moreover, ECG transmission did not impact on DTB time in patients transferred directly to the cath lab. ECG transmission did not confer any significant advantage in this small patient cohort. This should be reassessed in time with a larger sample size.

48. ATOLL Bio-Thrombotic Markers 1

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Background: The ATOLL (Acute ST-elevation myocardial infarction Treated with primary angioplasty and intravenous enoxaparin Or unfractionated heparin to Lower ischemic and bleeding events at short- and Long-term follow-up) randomized trial showed that intravenous heparin compared with unfractionated heparin (UFH) significantly reduced ischemic events.
Purpose: The study aimed to assess biomarkers of coagulation and platelet activation in patients on intravenous enoxaparin or UFH in the primary PCI (PPCI) setting with significant antiplatelet therapy and to correlate these findings with 1 month clinical outcomes.
Methods: Patients presenting with STEMI that were randomized to receive an intravenous bolus or either enoxaparin or UFH had blood sampling performed at sheath insertion at the commencement (T1) and at the end of the PPCI procedure (T2). The thrombotic factors, von Willebrand factor antigen (vWFAg), prothrombin fragment 1 + 2 (F1 + 2), thrombin-antithrombin (TAT) complex, tissue factor pathway inhibitor (TFPI) were measured along with the platelet marker, soluble CD40 ligand (sCD40L).
Results: A total of 129 patients ($n = 58$ enoxaparin and $n = 71$ UFH) were included. Of the numerous parameters measured, univariate analysis identified significant association between increased plasma levels of F1 + 2 and TAT measured at T2 and the incidence of the primary endpoint ($p = 0.05$ and $p = 0.03$) and the secondary ischemic endpoint ($p = 0.035$ and 0.036). The increasing release of F1 + 2 between T1 and T2 (Δ T2-T1) also predicted the primary (184.9 ± 61.1 vs 3.2 ± 34.7 pmol/L, $p = 0.01$) and secondary endpoints (318.8 ± 132.2 vs 36.9 ± 30.3 pmol/L, $p = 0.05$). Multivariate analysis identified increased plasma levels of F1 + 2 and TAT complex as independent correlates of the secondary ischemic endpoint at 1 month.
Conclusions: In this substudy of the ATOLL trial, markers of thrombin generation F1 + 2 and TAT complex are independently associated with short-term adverse ischemic events in PPCI patients.

49. ATOLL Thrombotic Markers 2

O'Connor SA, Kerneis M, Ankri A, Abtan J, Brugier D, Silvain J, Ecollan P, Vicaut E, Collet JP, Montalescot G

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Background: The ATOLL (Acute ST-elevation myocardial infarction Treated with primary angioplasty and intravenous enoxaparin Or unfractionated heparin to Lower ischemic and bleeding events at short- and Long-term follow-up) randomised trial showed that intravenous enoxaparin compared with unfractionated heparin (UFH) significantly reduced ischemic events with non significant reductions in bleeding complications.
Purpose: To compare the efficacy of enoxaparin and UFH in achieving target anticoagulation levels during percutaneous coronary intervention.
Methods: This was a single centre biological sub-study. Patients presenting with STEMI that were randomized to receive an intravenous bolus or either enoxaparin or UFH had blood sampling performed at sheath insertion at the commencement (T1) and at the end of the PPCI procedure (T2). To demonstrate pharmacological

efficacy we chose target ranges of 0.5–1.2 IU/ml for anti Xa levels for enoxaparin and 1.5–2.5 IU/ml activated partial thromboplastin time (APTT) ratio for UFH treated patients.
Results: A total of 133 patients (n = 58 enoxaparin and n = 71 UFH) were included. Of these 51 patients (n = 20 enoxaparin, n = 31 UFH, p = 0.288) were randomized pre-hospital in the mobile intensive care unit (MICU). In the pre-hospital treatment group more patients treated with enoxaparin were on-target than UFH at both T1 (78.9 vs 15.4 %), p < 0.0001) and T2 (84.2 vs 32.1 %, p = 0.0008). These findings were consistent in the overall group regardless of upstream treatment with target anticoagulation levels at T2 more readily achieved in patients receiving enoxaparin (80 % vs 18.2 %, p < 0.0001). Anti Xa and APTT ratio levels did not correlate with major or minor bleeding (p = 0.83, 0.72). Likewise there was no correlation between anticoagulation levels and ischemic events (p = 0.76).
Conclusions: In STEMI patients undergoing primary PCI target anticoagulation levels were more readily achieved in patients receiving intravenous enoxaparin than UFH. The more predictable and stable anticoagulation obtained with enoxaparin may explain the better outcomes observed in the main study.

50. Management of Allograft Vasculopathy Post Cardiac Transplant in the Era of Drug Eluting Stents

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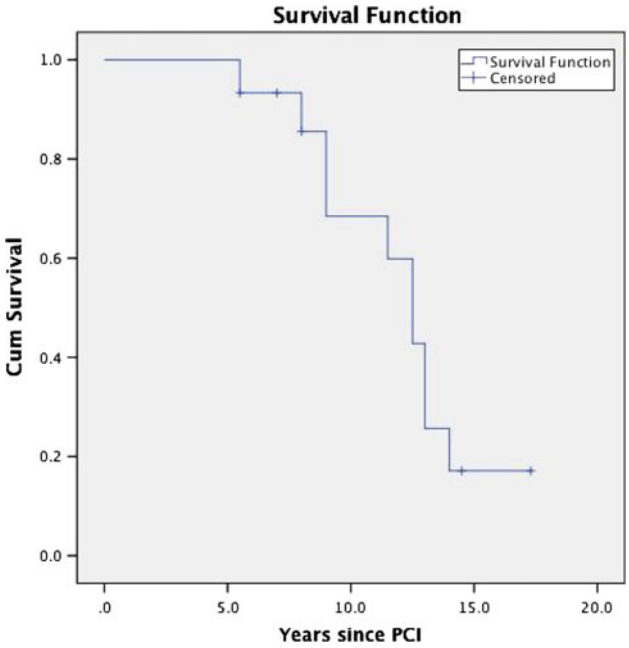
Purpose: Cardiac allograft vasculopathy (CAV) post transplant remains a problematic issue with no consensus on optimal management. We report on the long term outcomes of a cohort of patients with CAV treated with percutaneous coronary intervention (PCI).
Methods: We reviewed the medical records of all patients who underwent PCI with drug eluting stents (DES) for the management of CAV in a national transplant centre between 2002–2007.
Results: 15 patients underwent revascularisation therapy with DES. 93 % male. The mean time from cardiac transplant to intervention for CAV was 10.7 years (±3.5 years).

	Mean (±SD)
Age at Transplant(years)	45.6 (±12.36)
Male (%)	93
History of Tobacco Use (%)	40
Hypertension (%)	40
Drug treated dyslipidaemia (%)	66.6
Diabetes Mellitus (%)	0

Successful stent deployment (defined as <50 % residual stenoses) occurred in 100 %. The left anterior descending artery was the commonest target vessel (66.6 %) for intervention. Stents used were predominantly Paclitaxel (33.3 %) and Sirolimus (46.6 %). The mean diameter and length of stents deployed was 3.57 mm (± 2.3 mm) and 23.8 mm (± 12.5 mm) respectively. 1 patients died during revascularisation therapy. Overall 30 day mortality was 13.3 %.
33.3 % (5 patients) patients were alive and free from re-transplantation at a mean follow up of 8.14 years (±2.08 years).
40 % of patients demonstrated ≥ moderate instent restenosis at follow up angiography at a mean of 35.6 months (±13.17 months) post initial revascularisation therapy.
Conclusion: Patients who undergo coronary revascularisation with DES for allograft vasculopathy continue to have a high mortality rate despite intervention.



51. Application of ESC Guidelines to Rationalise Acceptance Criteria and Streamline Inpatient Cardiac Catheterisation

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Background: Over 2,000 patients are referred to the Belfast Trust annually for inpatient cardiac catheterisation. Individual consultant review and decision-making leads to avoidable scheduling delays and friction when a referral is declined.
Aim: The aim of this project was to produce a regionally-agreed matrix based on ESC guidelines for inpatient cardiac catheterisation and to evaluate it against a real-world cohort of referrals.
Methods: Using six sets of European society of cardiology (ESC) guidelines, acceptance criteria were identified, summarised and agreed across the region. Forty consecutive electronic referrals were the selected, anonymised and circulated to a wide range of cardiologists from both referring and receiving hospitals. They were asked to grade whether the referral should be accepted or declined and the expected timescale for completion of accepted procedures.
Results: The agreed matrix identified most acute coronary syndromes and ventricular arrhythmias as suitable for inpatient catheterisation and most valvular disease, most heart failure and stable angina as not suitable. Most referrals were for acute coronary syndromes (35/40; NSTEMI 29/40, STEMI 6/40) with smaller numbers referred for ventricular arrhythmias (2) valvular disease (2) and stable angina (1)Cardiologists graded referrals in line with agreed criteria, but with

residual clinical variation (Table). For acute coronary syndromes the majority of respondents believed that cases could be reliably assessed and graded by a nurse scheduler; for all other clinical categories this was not the case.

		Number of responses	
Category (number of patients)	Anticipated response (ESC)	Yes	No
Stable angina (1)	No	3/13	10/13
Valvular heart disease (2)	No	4/24	20/24
Ventricular arrhythmias	Yes	18/25	7/25
STEMI with successful lysis (2)	Yes	26/26	0/26
NSTEMI with high risk features (22)	Yes	342/373	31/373

Conclusions: An ESC guideline-based decision matrix has the ability to harmonise referral and acceptance criteria for inpatient cardiac catheterisation. This has greater applicability to patients with acute coronary syndromes (the majority) than to other clinical situations.

52. In The Current Era of ST Elevation Myocardial Infarction Treatment, Which Patients are Not Reperfused? An Observational Analysis

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Background: The current treatment of ST elevation myocardial infarction (STEMI) is mechanical reperfusion by Primary Percutaneous Coronary Intervention (PPCI) or systemic thrombolysis. Several factors are related to non-reperfusion, with advanced age being particularly significant. At present, no study has examined the presentation and characteristics of the non-reperfused patient in Ireland. Further study is clearly needed in this area, especially as the older demographic of the population increases.
Aim: To define, understand and critically evaluate STEMI patients who do not receive reperfusion therapy.
Methods: The Coronary Heart Attack Ireland Register (CHAIR) was used to identify STEMI patients who did not receive reperfusion therapy between January 1st 2007 and December 31st 2011. A retrospective review of patient charts was performed at Cork University Hospital, Mercy University Hospital, South Infirmary Victoria University Hospital and Mallow General Hospital. The contribution of non-reperfusion to patient mortality was also examined in terms of 30-day mortality and 1-year mortality post STEMI.
Results: 77 cases were included. Results indicate that most were female (N = 47, 61 %) with a median age of 80.39 years. 54.5 % (N = 42) had a past medical history of coronary heart disease with hypertension being the main risk factor (N = 43, 55.8 %). 49 % (N = 38) were considered independent in terms of ADLs. Patient mortality at 30 days post STEMI was 55.8 %. This increased to 61 % at 1 year.
Conclusion: As the older demographic in our population increases, this patient cohort will become particularly significant. Mortality among these patients is high yet a significant number were considered independent in terms of ADLs. Prospective evaluation of this patient cohort needs to take place to monitor the effect of the introduction of the PPCI National Strategy in Ireland in 2012. Internationally, larger studies are needed to determine the role of social factors as predictors of non-reperfusion.

53. Audit of Rates and Timeframe of Radial Artery Occlusion Post Radial Angiography

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Introduction: Rates of radial artery occlusion (RAO) post angiography vary between 1 and 20 %. It is generally asymptomatic however impacts on method of access for future angiography.
Aims: Audit the rate of RAO in patients undergoing coronary angiography in a single centre and identify timeframes with regard to both occlusion and recanalization.
Methods: Patients undergoing elective outpatient coronary angiography ± PCI were prospectively enrolled. All had radial artery patency confirmed pre procedure using the Allen's test. Patients underwent a reverse Allen's test at 1 day, 1 week and 1 month post procedure. Ultrasound of the radial artery was carried out in the case of an abnormal result.
Results: Thirty patients have been enrolled to date seven of which are female. Twenty-four procedures were diagnostic and six interventional. All patients had a 6Fr radial sheath inserted. Diagnostic catheters were 5 Fr and guides were 6 Fr. All patients received 3000 units of heparin plus top up heparin according to weight in interventional cases. In addition 46 % of patients received intra- arterial verapamil as per operator preference. The mean duration of the procedure was 31.3 min. RAO was confirmed by ultrasound in three patients. All of these had abnormal clinical exam at 24 h post procedure. Two had undergone diagnostic procedures of 20 min duration and had received 3000 units of heparin. One had undergone an FFR assessment of 40 min duration and had received standard and top up heparin plus verapamil. This patient had had a previous interventional procedure 2 weeks prior. There was no clinical evidence of recanalization at one month post RAO confirmation in all three.
Conclusion: Provisional results suggest that RAO occurs early post angiography and that recanalization takes at least a month. Prior recent angiography may be additional risk factor for development of RAO.

54. A Real World Comparison of Outcomes in Transradial Versus Transfemoral Access for Primary Pci: Single Centre Experience

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Introduction: The ESC recommends transradial (TRA) over transfemoral access (TFA) as the default access route for primary PCI (pPCI). The aim of this study was to explore whether real world outcomes with TRA were superior in a centre where all operators are proficient in both transradial and transfemoral PCI.
Methods: This was a retrospective observational analysis. All patients who had pPCI over a 1 year period were divided into 2 arms, depending on access route. Patients with access site crossover and those in cardiogenic shock were excluded. Baseline patient and procedural characteristics and outcomes were recorded.

Results: There was no difference in baseline characteristics, other than use of significantly more antithrombotic therapy in the TRA arm (table 1). Despite this, TRA was associated with lower contrast volumes, shorter CCU LOS, fewer access site complications, and less bleeding (table 2). The latter two were driven by a reduction in TIMI minor and minimal bleeding.
Conclusions: Consistent with recent trials, TRA was associated with better outcomes than TFA. We failed to demonstrate a reduction in major bleeding or mortality, however, in this small study.

Table 1

Demographics and procedural characteristics	Radial	Femoral	p-value
Age	60.9 (SD 12.3)	63.5 (SD 12.9)	0.27
Male	48 (77.4 %)	41 (74.5 %)	0.71
Heparin dose (SD)	7306 (1493)	6184 (1337)	0.001
GPIIbIIIa inhibitor	30 (48.4 %)	17 (30.9 %)	0.05
Thrombus aspiration catheter	44 (70.9 %)	41 (74.5 %)	0.67
Number of lesions stented	1.15 (0.44)	1.13 (0.34)	0.81
Number of stents deployed	1.61 (0.89)	1.9 (1.0)	0.14
6 French sheath	62 (100 %)	55 (100 %)	
Staged inpatient PCI	8 (12.9 %)	7 (12.7 %)	0.49

Table 2

Outcomes	Radial	Femoral	p-value
Procedure time	29.0 (SD 12.0)	26.6 (SD 11.5)	0.32
Fluoroscopy time	12.1 (6.4)	13.7 (7.9)	0.24
Radiation dose (mGycm2)	13075 (10838)	14071 (9685)	0.61
Contrast volume (ml)	225 (65)	251 (75)	0.04
Time to ambulation (days)	1.3 (1.1)	1.5 (0.92)	0.3
CCU LOS	3.1 (2.3)	3.8 (1.9)	0.049
Overall LOS	4.4 (1.81)	4.8 (1.72)	0.22
Access site complication	0	5 (9 %)	0.01
Bleeding	0	6 (10.9 %)	0.01
TIMI major bleeding	0	2 (3.6 %)	0.13
Inpatient mortality	2 (3.2 %)	2 (3.6 %)	0.96

55. A Study in Syncope: A Review of 94 Tilt Table Tests

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Recurrent syncope (RS) and postural tachycardia (POTS) can be difficult to diagnose and treat effectively. A tilt table test (TTT) provides orthostatic stress whilst heart rate (HR) and blood pressure (BP) are measured. We reviewed 94TTTs performed over 6 years to assess the usefulness of this investigation.

Altogether, 27 males (29 %, average age = 36) and 67 females (71 %, average age = 33) underwent TTT. Under-18 s comprised 20 % of the population. 12 % of studies were requested by Neurology.

SYNCOPE: 59 tests were performed (average age = 39, 71 %female). 29 tests (48 %) were positive plus 2 patients had epileptic seizures. Of those with positive TTTs; 19 (68 %)commenced Midodrine, 4 (14 %) received advice, 3 (11 %)commenced Fludrocortisone, 1 (3 %) commenced scopolamine patches and 2 (7 %) required pacemaker.

Amongst patients with negative tests; 2 were diagnosed with POTS due to inappropriate HR rise, and 2 with fast HR throughout were diagnosed as Inappropriate Sinus Tachycardia (IST).

POTS: 35 tests were performed (average age = 25, 74 %female). 18 tests (53 %) were positive and 1 patient was diagnosed with postural cerebral hypoperfusion following onset of headache on TTT. Of those with positive result; 8(44 %) received advice, 6(33 %) commenced Midodrine, 2(11 %) received Fludrocortisone, 1 commenced Bisoprolol (for postural palpitations) and 1 commenced Clonidine (for hyperadrenergic POTS—raised BP on standing).Two patients with negative tests were diagnosed with IST due to elevated flat HR response.
Conclusion: TTT can serve as a useful guide to diagnosis and treatment in both recurrent syncope and POTS.

56. Electrocardiographic Criteria for Predicting Infarct Related Artery Occlusion in Inferior Wall Acute Myocardial Infarction

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Background: Classically two arteries are usually involved in triggering inferior ST elevation MI, the right coronary artery (RCA) and the left circumflex artery (LCX). Its frequently possible to estimate the site of the infarct from the ECG and therefore estimate the culprit artery, this information is clinically significant as it provide prognostic mark as well as predicting the possible adverse outcomes.
Study Objectives: Primary objective is identification of the culprit coronary artery involved in the setting of acute inferior STEMI whether found to be RCA or LCX by assessing the 12 leads surface ECG in patients with acute inferior wall STEMI.
Secondary objective is to predict any possible correlation between the proximity of the lesion in the RCA and the degree of ST elevation in the inferior ECG leads in inferior ST elevation myocardial infarction related to RCA occlusion.
Study Design: Retrospective review.
Methods: 45 consecutive patients diagnosed with acute ISTEMI in Sligo Regional Hospital between 2010 and 2012 were included, standard 12 leads surface ECG recorded within 24 h of onset of symptoms, and all had Coronary within 7 days of presentation. ST segment elevation or depression was measured 0.08 s after the J point. Patients with LBBB on ECG, previous myocardial infarction, significant multi vessel disease, paced rhythm, or significant artefact on ECG were excluded from the study.
Conclusion: We were able to predict the IRA in case of ISTEMI through analysis of ST segment deviation on certain leads. The criterion of ST elevation III > II +ST segment depression lead aVL $\geq$ 0.5 mm predicts the RCA as infarct related artery with specificity of 92 % and PPV of 94 %. LCX artery can be as well predicted as IRA with specificity of 96 % and PPV of 88 % when the criterion of ST elevation lead II > III + ST segment depression leads V1 and or V2 is used.
We also found the proximity of the RCA lesion in the RCA group is directly proportionate to the mean of the summated total ST segments elevation in leads II, III, aVF, the difference is remarkable and highly significant specially when comparing between the means for the proximal and distal RCA lesion subgroups.

57. Early Experience of Cardiac Exercise Testing in A Primary Health Care Facility

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Aim: Exercise stress testing (EST) is a screening tool for coronary artery disease (CAD). Previous studies show an overall sensitivity of 67 % and specificity of 72 % with variable predictive values. The purpose of the current study was to evaluate the predictive value of EST in a new Primary care facility in Kilkenny.
Methods: This is a retrospective case series of 223 ESTs performed in a primary care facility from July 2012 to April 2013. EST results were classified as positive, negative, or equivocal. Outcomes studied from a review of outpatient and inpatient electronic medical record data included myocardial infarction, cardiac catheterization with angioplasty and stenting, coronary artery bypass grafting, a new diagnosis of CAD.
Results: Nearly all patients had low to intermediate risk pretest probability. 18 were positive, 35 were equivocal, and 170 were negative. There were 5 false-positive tests. There were 5 false-negative tests, 4 of which were treated with good outcomes. Out of the 35 equivocal results 5 had cardiac outcomes. Considering equivocal tests as positive, the overall sensitivity in this series was 72 %; specificity was 96 %. The positive predictive value was 18 % and the negative predictive value was 97 %.
Conclusions: The high negative predictive value for EST in this outpatient GP practice population is significant and reassuring. EST is a cost-effective strategy for triaging chest pain in low- to intermediate-risk patients in primary care facilities and should be included in the services offered to Primary care facilities which can reduce the burden on overstretched hospital resources.

58. Night Time Blood Pressure And Sub-Clinical Target Organ Damage: Findings from an Irish Primary Care Based Population Sample

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Introduction: The prognostic significance of nocturnal blood pressure is well recognised. The dipping phenomenon was first described by O'Brien and colleagues in 1988. More recently the focus has been on absolute levels to classify night-time blood pressure. Our aim is to determine whether dipping status or absolute night-time blood pressure levels are better associated with subclinical target organ damage.
Methods: The Mitchelstown Cohort was established to examine cardiovascular health in a middle-aged Irish adult population based sample recruited from one large primary care centre. Of 2047 participants 1207 (response rate 59 %), under-went 24 h ambulatory blood pressure monitoring. We excluded 135 studies due to incomplete data. Night-time blood pressure was classified by absolute levels and dipping status. Subclinical target organ damage was defined by Cornell Product ECG left ventricular hypertrophy (LVH) voltage criteria and urine albumin:creatinine ratio (ACR) >1.1 mg/mmol. Multi-variable logistic regression analysis was used to assess the association between night-time blood pressure and target organ damage.
Results: Of 1072 patients, 255 (24 %) had day-night hypertension and 64 (6 %) had isolated nocturnal hypertension [94 % of these were non-dippers or reverse dippers]. 165 (28 %) of the dippers had elevated night-time blood pressure. In the multivariable analysis each 10 mmHg rise in night-time systolic blood pressure resulted in an approximate doubling of risk for target organ damage. Odds ratio (OR) for ACR = 1.84(95 % CI 1.05–3.23) and OR for LVH = 2.20(95 % CI 1.13–4.27).
Discussion: Nocturnal hypertension rather than dipping status may be a better way to classify night-time blood pressure. Further interventional studies are required to determine if there is a benefit in reducing absolute night-time blood pressure levels.

59. Retrospective Analysis on Lipid Profiles in Very High Risk Patients Requiring PCI. Are We Adhering to the Guidelines?

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Introduction: European Society of Cardiology (ESC) guidelines recommends Low Density Lipoprotein (LDL) levels with a class 1 recommendation for target LDL of <1.8 mmol/L in patients with established coronary artery disease. We studied a cohort of patients presenting to University Hospital Limerick (UHL), Ireland, aiming to establish if there was significant improvement in patient lipid profile after PCI and whether adherence to ESC guidelines for secondary prevention was achieved in real life.
Methods: 243 patients presented to UHL for PCI from Jan 2012 – April 2013. Lipid profiles obtained at baseline (lipid profile during same admission for PCI and at follow up at post PCI clinic were analysed. A sub-study was carried out to establish for adherence to ESC guidelines where patient LDL levels were divided into three groups: <1.80, 1.81–2.5 and >2.5 mmol/L to establish the percentage of patients in each category.
Results: The mean time from baseline to follow up was 41.5 (SD 15.6) days. There was significant improvement across all lipid profiles as follows:

Lipid Profile	Mean Baseline Levels (mmol/L)	Mean Follow up Levels (mmol/L)	P Values
TC	4.57 (SD 1.13)	3.72 (0.91)	<0.001
LDL	2.69 (SD 0.96)	1.89 (0.71)	<0.001
HDL	1.13 (SD 0.36)	1.21 (0.37)	<0.001
Triglyceride	1.59 (SD 1.07)	1.32 (0.81)	<0.001

Analysing for adherence to ESC guidelines, there was significant improvement in patients adhering to ESC guidelines.

LDL level (mmol/L)	At baseline	At Follow up
<1.80	52 (21.4 %)	136 (56.0 %)
1.81–2.5	63 (26.0 %)	65 (26.7 %)
>2.5	128 (52.7 %)	42 (17.4 %)

Conclusion: Our study provided evidence of improvement in lipid profiles after PCI. There was significant reduction in TC, LDL and Triglyceride level and significant increase in HDL levels. However, only 56.0 % of patients met ESC guidelines for LDL control post

PCI. Even in the modern era of high dose statin post ACS, many patients (46.6 %) were not meeting ESC recommendations.

Session: Heart Failure/General Cardiology

60. STEMI Care in Ireland: Initial Experience of a New National Protocol and Information System

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Background: The Acute Coronary Syndrome (ACS) Clinical programme in the HSE initiated the national Optimal Reperfusion Service (ORS) in October 2012 in the West and South of Ireland followed by Dublin, North East and Midlands in January 2013 with the purpose of standardising and improving care of ACS patients.
A new monitoring mechanism, Heartbeat Portal, was developed in 2011 based on previous national and international experience. The purpose was to monitor key indicators of performance of the clinical programme.
Methods: Based on a previous initiative and international guidance, key performance indicators (KPIs) were established for monitoring. A data set with definitions and a new electronic collection mechanism, based on clinical data capture on HIPE, was agreed, piloted and initiated. Mechanisms for completeness, validation and analysis have been put in place.
The initiative focussed on key components of STEMI patient care initially—reperfusion therapy type and timeliness, discharge medications, smoking cessation counselling and referral for cardiac rehabilitation.
Results: Analysis of data for the first 3 months (Oct to Dec, 2012) from four hospitals is described here. Data for 9 months will be available by Sept, 2013.
138 patients with STEMI were recorded with a mean age of 63.5 years and 73.9 % male. The first positive ECG was largely taken in Emergency Department (52.9 %) or Ambulance (38.4 %). Excluding those contraindicated, 89 % of patients received Primary PCI and 69 % received Primary PCI within 120 min of 1st diagnostic ECG. Provisional outcomes show an in-hospital mortality of 6.5 % and a stroke rate of 4.3 %.
Conclusion: We describe the first three months of the new national optimal reperfusion service and a new information system. Using the Heartbeat portal aligned as it is with HIPE, offers a sustainable system of capture of demographic and clinical data for monitoring care of STEMI patients.

61. Trends in Hospitalisation for Acute MI in Ireland 1997–2008

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Objective: To study temporal and gender trends in age standardised hospitalisation rates, in-hospital mortality rates and indicators of health service use for acute myocardial infarction (AMI) and the subcategories ST elevation MI (STEMI) and non-ST elevation MI (NSTEMI) in Ireland, 1997–2008.
Design, Setting, Patients: Anonymised data from the Hospital In-Patient Enquiry were studied for the ICD codes covering STEMI and NSTEMI in all 39 acute hospitals in Ireland over a 12 year period. Age standardisation (direct method) was used to study hospitalisation and in-hospital mortality rates. Joinpoint regression analysis was undertaken to identify significant inflection points in hospitalisation trends.
Main Outcome Measures: Age standardised hospitalisation rates, in-hospital mortality and indicators of health service use (length of stay, bed days) for AMI, STEMI and NSTEMI patients.
Results: From 1997 to 2008 hospitalisation rates for AMI decreased by 27 % and by 68 % for STEMI patients (test for trend $p < 0.001$), and increased by 122 % for NSTEMI, (test for trend $p < 0.001$). The mean age of male STEMI patients decreased ($p < 0.01$) while those for the remaining groupings of AMI and subcategories increased. The proportion of males increased significantly for STEMI and NSTEMI ($p < 0.001$). In-hospital mortality decreased steadily ($p = 0.01$ STEMI, $p = 0.02$ NSTEMI), as did median length of stay.
Conclusions: We find a steady decrease in hospitalisation rates with AMI and a shift away from STEMI towards rising rates of NSTEMI patients who are increasingly older. In an ageing population and with increasing survival, surveillance of acute coronary syndrome and allied conditions is necessary to inform clinicians and policy makers.

62. A National Evaluation of the Aspirin Response

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Cardiovascular disease is the leading cause of death in most developed countries. There is strong evidence for the net benefits of aspirin in decreasing the risk of cardiovascular events in a wide range of patients. Nevertheless a significant proportion of patients experience recurrent cardiovascular events. With the advent of platelet function testing the concept of aspirin resistance or non-response has emerged. There is no clear data in Ireland on the therapeutic response to aspirin in patients with coronary artery disease. To address this question, at a national level, the first study of the National Cardiovascular and Stroke Research Network (NCSRN) prospectively evaluated the response to aspirin in 700 patients with stable coronary artery disease. Patients aged 18 years or older with a documented history of coronary artery disease on any dose of aspirin for 3 months were included in the study. Patients with unstable coronary syndromes, known haematological disorders or active malignancy were excluded. Demographic data were recorded and a blood sample was taken for Thromboxane B_2 (TxB_2) levels. All blood samples were analyzed in a central laboratory and demographic data recorded in a central data base. An interim analysis has shown that 20 % of the patients have a serum Tx of >2.2 ng/ml. Using a cut point of 2.2 ng/ml this suggests that 20 % of patients in Ireland with established coronary artery disease are not adequately 'protected' by aspirin. A preliminary analysis of the demographic data has demonstrated that age, hypertension, weight and alcohol consumption are risk factors for an inadequate response to aspirin. The full results of this study on behalf of the NCSRN will, if accepted, be presented at the Irish Cardiac Society in 2013.

63. Poor Cardiovascular Health of Patients Who Begin Haemodialysis in the Mid West Region of Ireland: A Pilot Initiative for a National Study

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Background: Recent studies in the US have demonstrated increasing acceptance of patients with a high burden of comorbid conditions and earlier initiation of dialysis treatment. These trends have important clinical, resource and economic implications. There is little data available in Ireland. To improve our understanding in this area, we analysed the characteristics of incident patients who were initiated on long-term haemodialysis in the Midwest Region.
Methods: We compared the characteristics of all new haemodialysis patients from 2009–2012 (n = 106). Data were extracted from clinical records, discharge summaries, laboratory information system and dialysis records using a standardised data collection instrument. Comparisons were made with respect to demographic characteristics, clinical conditions, laboratory measures, medication use, and process indicators during the pre-dialysis period across calendar years. Descriptive statistics and comparisons across years were conducted using the wald Chi square and analysis of variance.
Results: The prevalence of cardiovascular conditions were high at dialysis onset and were in general of the same magnitude/or greater that US incident dialysis cohorts). The prevalence of coronary disease was 39 %, Heart Failure 29 %, Stroke 16.3 % and the average serum albumin level was 28.3 (±5.5) g/L. Measurement of lipid level were performed in less than 1/3 of the cohort and the prescription of cardiovascular medications was less than 50 % or lower for most drugs across all calendar years. Encouragingly the rates of current smoking decreased over time ($P < 0.05$).
Conclusions: Patients who initiate dialysis therapy in the Midwest Region have substantial cardiovascular comorbidity that is similar to US cohorts. The management of known cardiovascular disease is less than optimal with low rates of lipid testing and cardiovascular medication use. Substantial opportunities exist to improve modifiable practice patterns in cardiovascular disease management.

64. Vortex Formation Time in the Assessment of Patients with Newly Diagnosed Haemochromatosis

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Background: Vortex formation time (VFT) is an index of the optimal conditions for vortex formation. In clinical Haemochromatosis (HC), subtle inefficient propagation of blood through the left ventricle (LV) may result from myocardial iron deposition, but accurate measures of response to treatment are lacking. We assessed echocardiographic-derived vortex formation time (VFT) in control subjects and patients with newly diagnosed HC.
Methods: Transthoracic echocardiography was performed in 20 normal subjects (mean age 49.19 ± 2.5) and in 20 patients who have early HC (mean age 50.66 ± 2.4) with elevated ferritin levels (953.8 ± 114.5). Conventional parameters and tissue Doppler (TD) indices were measured. VFTa was obtained using the formula: $4 \times (1 - \beta)/\pi \times \alpha^3 \times \text{LVEF}$, where β is the fraction of total transmitral diastolic stroke volume contributed by atrial contraction (assessed by time velocity integral of the mitral E- and A-waves) and α is the biplane end-diastolic volume $(\text{EDV})^{1/3}$ divided by mitral annular diameter during early diastole.
Results: The VFT was increased in HH subjects (3.49 ± 0.21) compared to controls (2.55 ± 0.21) ($P = 0.0037$). There was no difference in age, gender, body surface area ($P = 0.89$). The TD E' early diastolic myocardial velocities was decreased in HH (13.39 ± 0.68) compared to controls (15.87 ± 0.67) ($P = 0.0139$). Significant correlation was observed between VFT and TDE' ($R = -0.48$ & $P = 0.0012$). Post venesection VFT will be monitored as a measure of response to treatment.
Conclusion: VFT is a dimensionless index, incorporating LV diastolic parameters and may provide a useful parameter for the ongoing assessment of HC patients following venesection.

65. Hospitalisation for Heart Failure: Are We Getting to the Heart of the Matter?

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Background: In 2002 over 80,000 people in Ireland were believed to have heart failure. Greater technology, longevity and understanding of heart failure pathogenesis will see a rise to a approximately 10,000 new cases per year. Heart failure admissions accounts for almost 1 % of the health care budget in Ireland. A need to understand the epidemiological data in relation to admissions for heart failure plays an important part in planning of distribution of heart care services. It also enables to determine the impact of health care programs and policy implemented.
Aim: To analyse the trends in hospitalisations for heart failure in Ireland by examination of the number of admissions and length of stay.
Methods: Data (anonymised) was obtained through the Eurostat database covering ICD codes for heart failure (I50).
Results: From 2002–2010 there was a total of 51,541 admissions for heart failure, 28,207 of these were males, 23,334 females. The population over the age of 65 made up a large majority of these admissions 44,849. The age standardisation hospitalisation rates decreased from 157.5 to 127.2 per 100,000, a relative decrease of 19.2 %. Males showed a similar decline from 173.4 to 142.6 per 100,000, 18 % reduction. Females showed the greatest reduction 141.8 to 112.1 per 100,000 (21 %). In terms of length of stay there was a mild increase from 12.0 to 12.4 (3 %). The greatest reduction in LOS was in the 60–70 year old group from 11.4 days to 9.75 days.
Conclusion: The implementation of national policy and development of heart failure units has seen a significant reduction in the number of admissions of heart failure. There has been some reduction in length of stay, and future research should focus on the potential to improve this.