Final Program



# ANZSCTS 2016

## ANNUAL SCIENTIFIC MEETING

Sunday 6 – Wednesday 9 November 2016

Cairns Convention Centre
Cairns, Queensland, Australia

www.anzsctsasm.com

Platinum Sponsor:

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# WELCOME LETTER

On behalf of our colleagues and the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) we welcome you to the 2016 ANZSCTS Annual Scientific Meeting in Cairns, Queensland.

The focus of this year's meeting is set firmly on the exciting and challenging future ahead for our specialty. Many sessions will concentrate upon innovation, new technologies, and the future direction of cardiothoracic surgery. The reasons for this are self-evident: development of minimal access techniques combined with expanding percutaneous interventions has challenged the specialty to adapt, improve and re-invent. Surgeons look now to acquire skills previously considered the domain of interventional cardiologists, and retrain in "minimally invasive" approaches to the "traditional" operations such as valve replacement and repair. The pressure upon the specialty to "modernise" and adapt whilst maintaining excellent patient outcomes has never been greater.

This meeting will be attended by international surgeons who are leaders in their areas of expertise. They are known for their enthusiasm to meet challenges, embrace new technologies and encourage research and innovation.

We again incorporate the Advanced Trainees Wet Lab and a cardiothoracic Nurses Education Day within the meeting program. There will be topics to pique the interest of all – from those at the beginning of their training in our specialty to those with a wealth of experience.

A major feature of the meeting is the inclusive trade and technical exhibition which will provide delegates with information around technological advances and innovation. The role of industry in the development of new technologies is crucial to the ongoing modernisation of our specialty, and we encourage you to explore the exhibition.

Cairns is great – a beautiful, charming and calming environment that brings people together. This is a great opportunity for delegates and industry representatives to network personally and professionally.

We welcome you to the meeting and hope that you enjoy this year's program.

Emily Granger
2016 Scientific Convener

Michael Byrom
2016 Scientific Convener

Yishay Orr
2016 Scientific Convener





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## EXHIBITORS

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Acelity
Advanced Biomedical
ANZSCTS Database
Avant Mutual Group
Bard Australia
BD Medical
Biotronik
Central Data Networks Pty Ltd
DeSoutter Medical
Karl Storz Endoscopy
LMT Surgical
Maquet Getinge Group
Medela Australia
MediGroup EBI
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# INVITED SPEAKERS



**Dr Jonathan M. Chen**

Chief of Congenital Cardiac Surgery, Seattle Children's Hospital

Sam and Althea Stroum Endowed Chair in Pediatric Cardiovascular Surgery, University of Washington, USA

Dr Jonathan Chen is the Chief of Congenital Cardiac Surgery at Seattle Children's Hospital and the Sam and Althea Stroum Endowed Chair in Pediatric Cardiovascular Surgery at the University of Washington.

Dr Chen completed medical school and training at Columbia University where he remained on faculty at NewYork-Presbyterian, and was Director of Pediatric Cardiovascular Services (Cornell) and Surgical Director of Pediatric Heart Transplantation (Columbia). Since he joined the group in 2013, Seattle Children's Hospital has ranked among the top three busiest pediatric heart transplantation programs in the United States.

The author of more than 130 papers and 25 chapters, Dr Chen's research has focused primarily on topics pertaining to congenital cardiac surgery, transplantation, mechanical circulatory assistance for children, and alternative anticoagulants for cardiopulmonary bypass. He has co-edited a textbook of cardiac transplantation, and is recognized nationally and internationally as a leader in thoracic organ transplantation. He currently serves as Chair of the Membership and Professional Standards Committee within the United Network for Organ Sharing (UNOS), and is an active member of the AATS, STS, EACTS, SUS and CHSS. Dr Chen's interest include extending contemporary congenital cardiac care to the developing world, where he has led trips to Cambodia, Senegal, China, India and Brazil.



**Mr Joel Dunning**

James Cook University Hospital, Department of Cardiothoracic Surgery, Middlesbrough, United Kingdom

Joel Dunning is a consultant Thoracic Surgeon at the James Cook University Hospital, Middlesbrough, UK. He is the Associate Editor for Cardiothoracic Surgery for the European Journal of Cardiothoracic Surgery. He created Best Evidence Topics in the ICVTS and is on its editorial board. He is on the Editorial Board of the Annals of cardiothoracic surgery and the Journal of Visualised Surgery. He has been on the Clinical Guidelines committee of EACTS since 2007 and has written 5 guidelines in this time including guidelines on Atrial fibrillation, antiplatelet and anticoagulation management and most recently on the management of resuscitation after cardiac surgery. He is also Chairman of the STS guidelines committee which is about to publish a guideline in resuscitation after cardiac surgery, and he is on the STS workforce for evidence based surgery. He is Co-Editor in Chief of www.CTSNet.org and a regular contributor of surgical videos to this and to youtube.

He has also recently been working on a new way of performing VATS lobectomies called microlobectomy (www.microlobectomy.com), and is the second surgeon in the UK to have commenced a programme of Robotic Lobectomy. He performed the UKs first uniportal subxiphoid lobectomy and the UKs first robotic total lung-sparing sleeve resection this year. He participates in the VIOLET Study, a randomised study of VATS versus open lobectomy currently recruiting in the UK, the PULMICC Study a study randomising patients with colorectal metastases to surgery or conservative treatment, and he is conducting a study on radiolabelled nodule excision.

He is a proctor for cardica who have created a 5mm stapler and he is a proctor for Intuitive surgical for robotic lobectomy. His major interest is in trying new ways of performing thoracic surgery and trialling novel devices and there is nothing he enjoys more than meeting enthusiastic thoracic surgeons with great ideas to share.

# INVITED SPEAKERS (CONT'D)



**Mr Andre R. Simon**

Director of Heart and Lung Transplantation and Ventricular Assist Devices

Consultant Cardiac Surgeon, Royal Brompton and Harefield NHS Trust, United Kingdom

Mr André Simon's areas of expertise include cardiac surgery and heart failure surgery, total arterial revascularization, aortic surgery and reconstructive aortic valve surgery, heart and heart-lung transplantation, living related lung transplantation, ventricular assist devices (artificial hearts) and ex vivo lung perfusion for cancer patients.

Mr Simon is a Consultant Cardiothoracic Surgeon, the Director of the Department for Heart and Lung Transplantation and Mechanical Circulatory Support. He trained at the Christian Albrechts University in Kiel, Germany, the Harvard Medical School, USA and the Hannover Medical School, Germany, where he qualified as a cardiac and thoracic surgeon.

Mr Simon worked as an attending cardiac surgeon at Hannover Medical School from 2003 to 2010 and was the director of the Hannover Thoracic Transplant Program in 2007-2010, where he was instrumental in the clinical development of minimally invasive lung transplantation, the development of new ex vivo lung perfusion techniques and the concept of partial circulatory support.

Mr Simon's scientific interests include transplantation and transplantation immunology, cardiac imaging and ventricular assist devices. He is the author of more than 100 peer-reviewed papers, reviews and editorials, and has contributed chapters to a variety of text books. As well as being a reviewer for a number of international peer-reviewed journals, Mr Simon is a member of numerous international boards and scientific advisory committees.



**Professor David Taggart**

University of Oxford, Department of Cardiovascular Surgery, Department Cardiac Surgery

John Radcliffe Hospital, United Kingdom

David Taggart is currently Professor of Cardiovascular Surgery at the University of Oxford. He qualified from Glasgow University in 1981 and in 1989 was awarded an MD with Honours for studies on the effects of hypothermia on the metabolic response to cardiac surgery. He subsequently trained as the Senior Registrar at the Royal Brompton Hospital under Professor Yacoub and Mr Lincoln.

In 1995 he was appointed consultant cardiac surgeon at the John Radcliffe hospital in Oxford where he obtained a PhD (from Strathclyde) for studies of the inflammatory response during cardiac surgery. In 2004 he was appointed Professor of Cardiovascular Surgery at the University of Oxford.

His main interests are coronary revascularization, arterial grafts and off pump surgery. He has authored over 150 peer reviewed scientific papers and is the PI of the ART trial- one of the largest surgical trials ever conducted (a randomized trial of 3000 CABG patients to single or bilateral IMA grafts during CABG).

He was President of the Society for Cardiothoracic Surgery of GB and Ireland (April 2010-April 2012), Chairman of the European Society of Cardiology Cardiovascular Surgery Working Group, a member of the Adult Domain of the European Association for Cardiothoracic Surgery and a member of the AATS and STS. He was recently appointed as the lead for Cardiothoracic Surgery in the UK by the Royal College of Surgeons of England.





# GENERAL INFORMATION

## VENUE

The meeting will be held at the Cairns Convention Centre, starting on Sunday 6 November 2016 and finishing on Wednesday 9 November 2016.

For more information on the venue please visit: www.cairnsconvention.com.au

## REGISTRATION DESK

The registration desk will be open at the following times:

| | |
|---|---|
| Sunday 6 November 2016 | 7:00am – 6:00pm |
| Monday 7 November 2016 | 7:00am – 6:00pm |
| Tuesday 8 November 2016 | 6:30am – 6:00pm |
| Wednesday 9 November 2016 | 6:30am – 12:30pm |

## SPEAKERS' SUPPORT

Presenters are requested to submit their PowerPoint presentations to the speakers' support desk at least two hours prior to the commencement of the session in which they are speaking. The speakers' support desk is located in Meeting Room 7 located on the Mezzanine Level of the Cairns Convention Centre. A technician will be available at the speakers' support desk from Sunday 6 to Wednesday 9 November 2016.

## DRESS

| | |
|---|---|
| Scientific Sessions: | Smart casual |
| Welcome Reception: | Smart casual |
| Meeting Dinner: | Smart casual (no denim) |

## CME/CPD POINTS

This educational activity has been approved in the Royal Australasian College of Surgeons CPD Program. Fellows who participate can claim one point per hour (maximum 20 points) in Category 4: Maintenance of Knowledge and Skills. RACS CPD Online will be updated at the conclusion of the Meeting for RACS Fellows who participate.

## CERTIFICATE OF ATTENDANCE

Delegates requiring a certificate of attendance should register their request with staff at the registration desk. Certificates will be emailed to these delegates after the conclusion of the Meeting.

## DIETARY REQUIREMENTS

Please note that the venue is responsible for all catering at the meeting and ANZSCTS/Meeting Organiser does not inspect or control food preparation areas or attempt to monitor ingredients used. You should contact the venue directly for all special dietary requirements during the meeting, irrespective of whether details have been provided to ANZSCTS/Meeting Organiser. If ANZSCTS/ Meeting Organiser requests information about your dietary requirements for a specific event ANZSCTS/Meeting Organiser will endeavour to forward the information provided to the venue (time permitting). ANZSCTS/ Meeting Organiser will not retain information provided for future events, so you must verify your requirements for each event. Even if information is requested or provided, ANZSCTS/ Meeting Organiser takes no responsibility for ensuring that the venue acknowledges your dietary requirements or that these requirements can be met. In all cases you must verify for yourself that your dietary requirements have been met and ANZSCTS/ Meeting Organiser refutes any and all liability for any failure to adequately provide your special dietary requirements or any consequential damage resulting from such failure.

## POSTERS

Scientific Posters will be displayed electronically at poster stations located in the industry exhibition area.

## INTERNET FACILITIES

Network: CCCConvention
Password: cairns2016

# GENERAL INFORMATION (CONT'D)

## OFFICIAL FUNCTIONS

### ANZSCTS ASM Welcome Reception

Date: Sunday 6 November 2016
Venue: Outdoor Plaza
Cairns Convention Centre
Time: 6:00pm to 9:00pm
Cost: Complimentary for registered delegates.
Additional tickets cost $95.00 per person.

Tickets are essential. If you have a full registration and would like to attend or if you would like to purchase an additional ticket, please enquire with the staff at the registration desk regarding availability.

Delegates are to make their own way to the Welcome Reception.

### ANZSCTS ASM Meeting Dinner

Date: Tuesday 8 November 2016
Venue: Pullman Cairns International
17 Abbott Street, Cairns
Time: 7:00pm to 10:30pm
Cost: $170.00

Tickets are essential. If you have a full registration and would like to attend or if you would like to purchase an additional ticket, please enquire with the staff at the registration desk regarding availability.

Delegates are to make their own way to the Meeting Dinner.

## BUSINESS MEETINGS

### Chair/Supervisors Meeting (CTS Board)

Sunday 6 November 2016
8:00am – 10:00am
Meeting Room 9

### Foundations Skills for Surgical Educators

Sunday 6 November 2016
10:30am – 6:00pm
Meeting Room 9

### Meet The Editors

Heart, Lung And Circulation And The Annals Of Cardiothoracic Surgery

Sunday 6 November 2016
4:30pm – 5:30pm
Meeting Room 8

### ANZSCTS Annual General Meeting

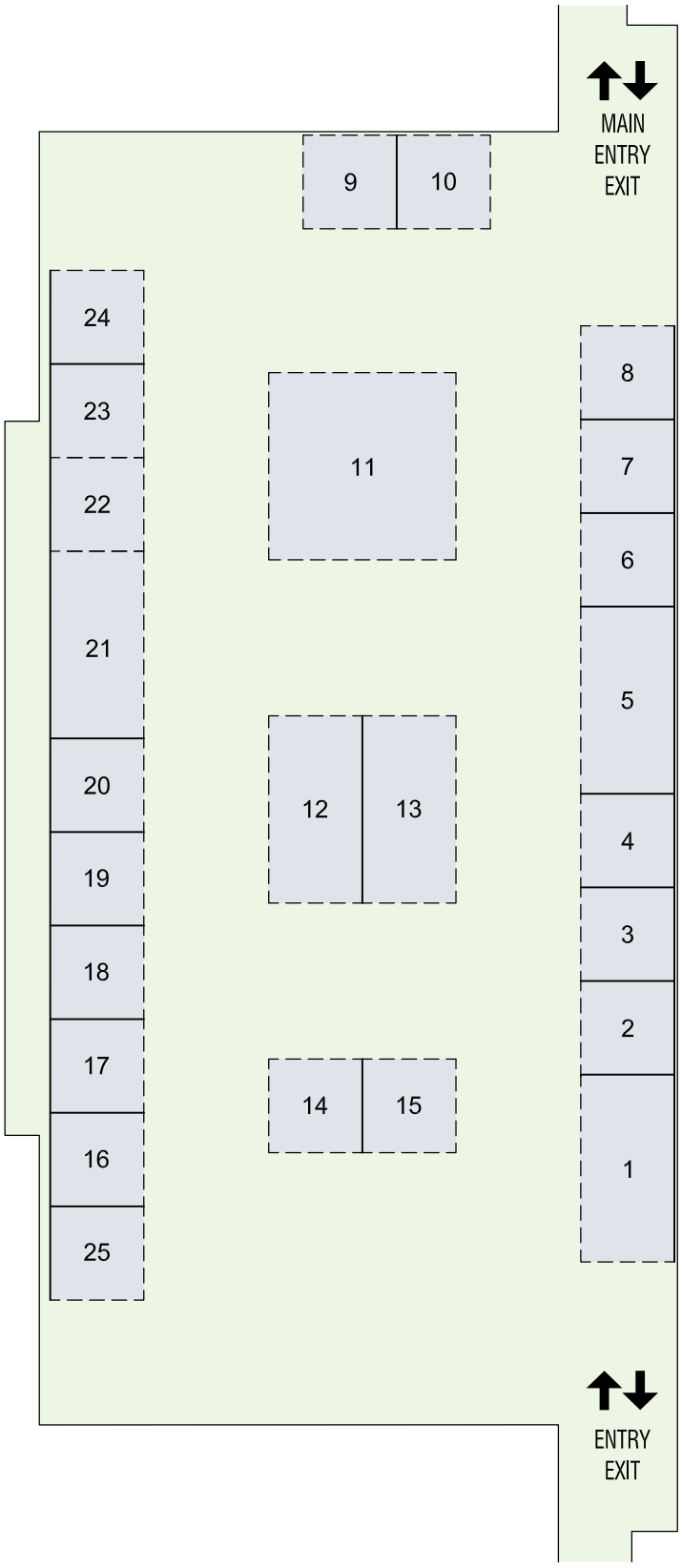
(ANZSCTS Members only)

Monday 7 November 2016
6:00pm – 7:00pm
Hall A

# 2016 ORGANISING COMMITTEE

| | |
|---|---|
| **Michael Byrom** | Scientific Convener |
| **Emily Granger** | Scientific Convener |
| **Yishay Orr** | Scientific Convener |
| **Andrew Cochrane** | Science and Education Chair |
| **Paul Bannon** | ANZSCTS President |
| **Trevor Fayers** | ANZSCTS Vice President |
| **Homayoun Jalali** | Elected Representative |
| **Kylie Duncan** | Nurses Convener |
| **Dominique Olsen** | Nurses Convener |
| **Michael Nugara** | ANZSCTS CEO |
| **Nick Danes** | ANZSCTS COO |

# EXHIBITION FLOOR PLAN




## EXHIBITORS

1 Reid Healthcare
2 Abbott Vascular
3 LMT Surgical
4 MediGroup EBI
5 Medtronic
6 Advanced Biomedical
7 Avant Mutual Group
8 Karl Storz Endoscopy
9 N Stenning & Co Pty Ltd
10 Bard Australia
11 Edwards Lifesciences
12 LivaNova Australia Pty Ltd
13 St. Jude Medical
14 Medela Australia
15 Zimmer Biomet CMF & Thoracic
16 ANZSCTS Database
17 BD Medical
18 DeSoutter Medical
19 Posthorax Limited
20 Biotronik
21 Johnson & Johnson Medical
22 Acelity
23 Teleflex Medical Australia
24 Maquet Getinge Group
25 Central Data Networks Pty Ltd

*Note: Floor plan correct at time of printing however, the organising committee reserves the right to change the floor plan without notice.*

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* Raghav et al. Long-term durability of Carpentier-Edwards [PERIMOUNT] Magna Ease valve: A one billion cycle in-vitro study. Ann Thorac Surg 2016 doi: 10.1016/j.athoracsur.2015.10.069.

† Based on a double-blinded survey of 255 US cardiac surgeons in Q4 2014. Data on file.

**Important Safety Information:** Aortic Bioprostheses
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# SCIENTIFIC PROGRAM

## Pre-Meeting Workshops

### SUNDAY 6 NOVEMBER 2016

**8:00am - 6:00pm** **NURSES' EDUCATION DAY**

**8:00am - 4:30pm** **ANZSCTS ADVANCED TRAINEES WET LAB**

**4:30pm - 5:30pm** **MEET THE EDITORS**
**Heart, Lung And Circulation And The Annals Of Cardiothoracic Surgery**
Meeting Room 8

**6:00pm - 9:00pm** **WELCOME RECEPTION**
Outdoor Plaza, Cairns Convention Centre

## Scientific Program

### MONDAY 7 NOVEMBER 2016

**8:00am - 8:10am** **WELCOME AND OVERVIEW**
**Adapt, Innovate And Improve Cardiothoracic Surgery**
Hall A

**8:10am - 8:20am** **ANZSCTS PRESIDENTIAL ADDRESS**
Hall A
Paul Bannon

**8:20am - 10:00am** **SCIENTIFIC SESSION 1**
**The Rise of New Technologies For Aortic Valve Stenosis**
Hall A
Chairs: Paul Bannon and Matthew Horton

8:20am TAVI Update – Where Is The Technology Going?
David Roy

8:40am Australian TAVI Program – A Surgeon's Perspective
Greg Rice

9:00am Aortic Valve Surgery – Minimal Access Surgery To The Rescue?
Simon Moten

9:20am Sutureless Aortic Valve Implantation: Single Surgeon Experience
Adademir Alp

9:25am Single Centre Outcomes Of The Intuity Rapid Deployment Aortic Valve: An Australian Experience
Reece Davies

9:30am Propensity Matched Comparison Of Surgical Aortic Valve Replacement With Transcatheter Aortic Valve Implantation: A Single Centre Experience
Alfred Hing

9:35am Surgical Aortic Valve Replacement Versus Trans-Femoral Aortic Valve Implantation Using The Lotus Bio-Prosthesis: Early And Mid-Term Outcomes
Eric Yu Wei Lo

9:40am How They Fare: Octogenarians Undergoing Aortic Valve Replacement
Elizabeth Suthers

9:45am Frailty Assessment In Cardiac Surgery: A New Paradigm In Preoperative Risk Stratification
Christopher Harris

9:50am Discussion

**10:00am – 10:30am** **Morning Tea**

**10:30am - 10:40am** **RACS PRESIDENTIAL ADDRESS**
Hall A
Phil Truskett

**10:40am - 10:50am** **ANZSCTS DATABASE UPDATE**
Hall A
Nupur Nag

**10:50am - 12:30pm** **SCIENTIFIC SESSION 2**
**ECMO, Mechanical Assist Devices**
Hall A
Chairs: Emily Granger and Yishay Orr

10:50am ECPR ECMO For Cardiogenic Shock: Patient Selection And Cannulation Strategies, Including The 2CHEER Trial
Sean Scott

11:10am How To Do ECMO Well – Who, How, When, Retrieval Options
Roger Pye

11:30am LVAD Update – State Of The Art And What Is Up Next
Andre Simon
(International Invited Speaker)

## Scientific Program (cont'd)

11:50am — Transplantation For Congenital Heart Disease
Jonathan Chen
(International Invited Speaker)

12:10pm — The Non-Ejecting Heart On VA ECMO: Strategies For Venting The Left Heart
Neil Curran

12:20pm — Banked Blood In The Recovery Of Donation After Circulatory Death (DCD) Hearts In A Porcine Model
Hong Chee Chew

12:25pm — Prophylactic INtra-Aortic BALLoon Counterpulsation In High Risk Cardiac Surgery: The PINBALL Programme Of Research And Linked-Data Pilot RCT
Edward Litton

**12:30pm – 1:30pm** — **Lunch**

**1:30pm - 3:30pm** — **SCIENTIFIC SESSION 3**
**Coronary Artery Surgery – Evolution Or Back To The Future?**
Hall A
Chairs: Chris Cole and Harsh Singh

1:30pm — Arterial Grafting – When, Why And How To Do It. When And How Do I Use Vein?
David Taggart
(International Invited Speaker)

1:50pm — Clampless CABG Techniques, Midcab, Robotic Techniques
Michael Vallely

2:10pm — Percutaneous Coronary Intervention In The Future
David Roy

2:30pm — PCI And CMBS Review – Implications For Cardiac Surgeons
James Tatoulis

2:45pm — Comparing Outcomes Of Multiple Arterial Grafting With Left Internal Mammary Artery And Saphenous Vein Grafting In Coronary Artery Bypass Surgery: A Single Large Volume Uk Centre Experience
Alfred Hing

2:55pm — Bilateral Versus Single Internal Thoracic Artery Grafting In Diabetic And Older Patients With Triple Vessel Disease: Analysis Of A Multicentre Database
James Farag

3:05pm — Is It The Artery Or The Vein That Is More Important In Late Outcome After CABG?
Alistair Royse

3:25pm — Discussion

**3:30pm – 4:00pm** — **Afternoon Tea**

**4:00pm - 6:00pm** — **SCIENTIFIC SESSION 4**
**Research, Innovation, New Devices**
Hall A
Chairs: Wingchi Lo and Julian Smith

4:00pm — Horizon Scanning In Thoracic Surgery – Radiolabelled Nodule Excision, Current/ Future Trials In The UK
Joel Dunning
(International Invited Speaker)

4:15pm — Evolution Of Mitral Valve Treatment
Paul Jansz

4:30pm — Long-Term Outcomes Comparison Of Mitral Valve Replacement Versus Repair In Elderly Patients
Anthony Furnary

4:45pm — Transmedics OCS – The Future Of Donor Heart Management?
Andre Simon
(International Invited Speaker)

5:00pm — Aortic Valve Replacement – Right Anterior Thoracotomy
Hugh Wolfenden

5:15pm — The Heart Team Concept – The Surgeon's Role
Jurgen Passage

5:30pm — Rapid Deployment Aortic Valve Replacement
Andrew Newcomb

5:45pm — Presentation – Edwards Lifesciences
Christine Fontana

**6:00pm - 7:00pm** — **ANZSCTS ANNUAL GENERAL MEETING**
Hall A





## Scientific Program (cont'd)

### TUESDAY 8 NOVEMBER 2016

**7:00am - 8:00am** **MASTERCLASS 1**
**ECMO – How I Do It**

*(Complimentary for registered delegates. A light breakfast will be provided).*

Meeting Room 8

Chair: Emily Granger

**7:00am - 8:00am** **MASTERCLASS 2**
**Minimal Access Aortic Surgery – How I Do It**

*(Complimentary for registered delegates. A light breakfast will be provided).*

Hall A

Chair: Paul Jansz

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**8:00am - 10:30am** **SCIENTIFIC SESSION 5**
**Thoracic Surgery**

Hall A

Chairs: Mark Edwards and Bruce French

8:00am Lobectomy Approaches
Joel Dunning
(International Invited Speaker)

8:20am Minimally Invasive Mediastinal Surgery
Joel Dunning
(International Invited Speaker)

8:40am Benchmarking Thoracic Surgery In Australia – Referral To Resection Time, Surgical Resection Rate, What Else? National Audit?
Naveed Alam

9:00am Bronchial Stenting – Current Technology, Indications
Jonathan Williamson

9:20am Surgical Repair Of Tracheobronchomalacia – When, Why And How?
Michael Byrom

9:40am Cryobiopsy – The Cool New Airway Tool
Jonathan Williamson

10:00am Comparing Video Assisted Thoracoscopic Lobectomy With Open Lobectomy: Results From A High Volume UK Centre
Alfred Hing

10:10am 11 Years Of Resuscitative Thoracotomies For Blunt And Penetrating Trauma At A Level 1 Trauma Centre
Shivangi Jog

10:15am Effects Of Preoperative Renal Function On Outcomes Following Cardiac Surgery: A Comparative Study Of 1875 Patients
Sameer Thakur

10:20am Discussion

**10:30am – 11:00am** **Morning Tea**

**11:00am - 1:15pm** **SCIENTIFIC SESSION 6A**
**Adult Congenital Heart Disease**

Hall A

Chairs: Yishay Orr and Homayoun Jalili

11:00am Management Of The Small Aortic Annulus – Tips And Tricks To Enlarge The LVOT And Aortic Root
John Artrip

11:20am Approaches To The Post-Coarctation Aorta – Recoarctation, Pseudoaneurysms And Aneurysms
Richard Chard

11:40am Pulmonary Valve Replacement – Now And The Future
Nelson Alphonso

12noon The Failing Systemic RV – What Should We Do?
Jonathan Chen
(International Invited Speaker)

12:20pm Outcomes Of The Arterial Switch Operation In Patients With Concomitant Aortic Arch Obstruction As A Single Stage Repair
Tyson Fricke

12:30pm Long-Term Outcomes Following Repair Of Truncus Arteriosus And Interrupted Aortic Arch
Phillip Naimo

12:40pm Life After Surviving Fontan Surgery: A Meta-Analysis Of The Incidence And Predictors Of Late Death
Chin Poh

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## Scientific Program (cont'd)

12:50pm Single Centre Experience With The Ross-Konno Procedure For Critical Aortic Stenosis In The Paediatric Population
Thilina Bandara

1:00pm Tissue Engineered Bovine Pericardium (Cardiocel) For Repair Of Congenital Heart Defects: Histopathology And Outcomes At Mid-Term Follow Up
Douglas Bell

1:10pm Surgical Relief Of Left Ventricular Outflow Tract Obstruction In Adults With Congenital Aortic Stenosis And Associated Aortic Annulus Hypoplasia And / Or Subaortic Obstruction
Tanveer Ahmad

**11:00am - 12:10pm** **SCIENTIFIC SESSION 6B**
**Trainee Research Papers**
Meeting Room 8
Chairs: Phillip Antippa and Gareth Crouch

11:00am Early Outcomes Of Rapid Deployment Aortic Valve Replacement: The Prince Charles Experience
Cheng He

11:10am Direct Innominate Artery Cannulation As Sole Visceral And Cerebral Perfusion Technique In Thoracic Aortic Surgery
Alireza Kashani

11:20am Lobectomy In Septagenarians With Non-Small Cell Lung Cancer: Open Vs VATS Approach
Laura Fong

11:30am Cardiac Surgery In Octogenarians: Early Outcome And Medium-Term Survival
Mohammad Azari

11:40am Synchronous Anaortic Off-Pump Coronary Artery Bypass Surgery And Carotid Endoarterectomy: A Case Series
Fabio Ramponi

11:50am Discussion

**1:15pm – 2:15pm** **Lunch**

**2:15pm - 3:30pm** **SCIENTIFIC SESSION 7**
**Young Acheivers Award Presentations**
Hall A
Chairs: Andrew Cochrane and John Artrip

2:15pm Edwards Lifesciences Travelling Scholarship Award

2:20pm Heart And Lung Transplantation At Fiona Stanley Hospital – A New Centre's Experience
Charles Jenkinson

2:30pm Percutaneous Approach To The Mitral Valve: The Prince Charles Experience
Cheng He

2:40pm Haem-Enzymes Predictive Of Coronary Artery Disease Are Present In Thoracic And Abdominal Aortic Aneurysm
Andrew Sherrah

2:50pm Relationship Between Urinary Oxygen Tension During Cardiopulmonary Bypass And Development Of Acute Kidney Injury
Michael Zhu

3:00pm Short And Longterm Indigenous Australian Cardiac Surgery Outcomes
Scott Jennings

3:10pm Effect Of Ageing On Donation After Circulatory Death (DCD) Heart In Rodent Model
Hong Chee Chew

3:20pm Announcement of the Young Achievers Award

**3:30pm – 4:00pm** **Afternoon Tea**

## Scientific Program (cont'd)

**4:00pm - 6:00pm** **SCIENTIFIC SESSION 8**
**Mitral Valve Perspectives**
Hall A
Chairs: Paul Jansz and Levi Bassen

4:00pm Chordal Preservation In Mitral Valve Repair
Trevor Fayers

4:20pm Minimally Invasive Mitral Valve Repair – European Perspectives
Martin Misfeld

4:40pm Biomechanics And Myocardial Damage In Chronic Mitral Regurgitation
David McGiffin

5:00pm Outcomes In Minimally Invasive Mitral Vale Repair – 200 Cases
Yujiro Kawanishi

5:15pm Heater Cooler Unit Related Endocarditis – Case Report And Implications For Cardiac Surgical Units
Wingchi Lo

5:30pm Relationship Between Amount Of Tissue Resection And Outcome Following Surgical Septal Myectomy For LVOT Obstruction: The Prince Charles Experience
Cheng He

5:40pm Propensity Score Analysis Supports The Benefit Of The Heart Team Meeting On Mortality In High-Risk Cardiac Surgery
Shanq Kuen Koo

**7:00pm - 10:30pm** **ANZSCTS MEETING DINNER**
Pullman Cairns International
*(Transfers are not included. Guests to make their own arrangements to the venue.)*

## WEDNESDAY 9 NOVEMBER 2016

**7:00am - 8:00am** **MASTERCLASS 3**
**Receive The Protection You Need And More – Uncover More About Australia's Leading MDO**
*(Complimentary for registered delegates. A light breakfast will be provided)*
Meeting Room 8
*Proudly supported by:* Avant mutual group

**7:30am - 8:30am** **MASTERCLASS 4**
**Medistim MiraQ Ultimate: Ultrasonic Surgical Guidance And CABG Quality Assessment**
*(Complimentary for registered delegates. A light breakfast will be provided)*
Hall A
Chair: Bruce French
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**8:30am - 10:10am** **SCIENTIFIC SESSION 9**
**Aortic Dissection And Major Aortic Surgery – New Approaches, New Strategies**
Hall A
Chairs: Graham Meredith and Bruce French

8:30am Arch Surgery – Innovative Approaches 2016
George Matalanis

8:50am Type A Aortic Dissection 2016 – New Approaches Or Stick To The Basics?
Nick Roubos

9:10am Frozen Elephant Trunk With End Vascular Completion For Complex Aneurysms
Marco Larobina

9:30am Role Of David And Ross Procedure In 2016
Peter Skillington

9:50am A "Hybrid" Hybrid Approach – Aortic Debranching Using A Trifurcate Graft For Arch And Descending Thoracic Aortic Aneurysm Repair With The Thoraflex™ Hybrid Graft
Charles Jenkinson





## Scientific Program (cont'd)

9:55am — Long Term Outcomes For Patients Receiving Consecutive Bioprosthetic Aortic Valve Replacement
Matthew Haydock

10:05am — Does The Cerebral Protection Strategy Alter Outcomes In Acute Type A Aortic Dissection Repair?
Alfred Hing

**10:10am – 10:40am** **Morning Tea**

**10:40am - 12:30pm** **SCIENTIFIC SESSION 10**
**Challenges, Pitfalls, Technical Tricks And Keeping It Simple**
Hall A
Chairs: Michael Byrom and Peter Skillington

10:40am — Hazardous Redo Sternotomy – Patent Grafts, Right Sided Structures, Aorta / Adult Congenital Challenges
Jonathan Chen
(International Invited Speaker)

11:00am — Transplant Challenges – Redo Chaos, The Connections Are All Wrong, Retrieval Surgery Misadventures And Acute Allograft Failure
Andre Simon
(International Invited Speaker)

11:20am — Dealing With Complications Of VATS Lobectomy
Joel Dunning
(International Invited Speaker)

11:40am — Chronic Kidney Disease is Associated with Poor Outcomes after Isolated Coronary Artery Bypass Grafting
Andrew Cochrane

11:50am — Learning Coronary Anastomosis – Quantifying The Process
James Wood

12noon — Infective Endocarditis; A Hunter New England Perspective
Fiona Doig

12:10pm — Deep Sternal Wound Infections – Immediate Sternal Fixation Or Vac & Flap?
Yuvaraj Davidson

12:15pm — Mortality And Thromboembolic Events In Hypercoagulable States From ROTEM-Thromboelastometry In Patients Who Undergo Coronary Bypass Surgery
Sira Laohathai

12:20pm — ANZSCTS Database Program – Monitoring Cardiac Surgical Performance For Improved Patient Outcomes
Nupur Nag

**12:30pm** **Meeting Concludes**



# VERBAL ABSTRACTS





# VERBAL ABSTRACTS

*Alphabetical order by presenting author's surname.*

## SURGICAL RELIEF OF LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN ADULTS WITH CONGENITAL AORTIC STENOSIS AND ASSOCIATED AORTIC ANNULUS HYPOPLASIA AND / OR SUBAORTIC OBSTRUCTION

Dr Tanveer **Ahmad**, Mr Marco Larobina, Mr Peter Skillington

*Royal Melbourne Hospital, Melbourne, VIC*

**Background:** In children and adolescents, a Ross/Konno operation is commonly done to both enlarge the aortic root and provide a competent aortic valve with relief of left ventricular outflow tract obstruction (LVOTO). Optimum management is not so straightforward in adults.

**Methods:** Between 1995 and 2014, 17 patients of mean age 39.4 years (18-57 years) with hypoplastic aortic annulus (AA) measuring 20mm and less, and mean aortic valve/LVOT gradient of 61mm Hg (30-70m Hg) presented for surgery.

**Results:** 8 patients with mean LVOT/AA diameter 19.6 mm (18-20mm) underwent an inclusion- cylinder type Ross procedure (RP). 9 patients with more severe LVOT/ AA obstruction, mean diameter 0f 17.4 mm (16-19mm) underwent mechanical aortic valve replacement with standard Konno type aortoventriculoplasty. There was zero early and late mortality; no re-operations were required, with mean follow up of 7.6 years (1-20 years). Last echo shows residual mean gradient across LVOT/AA of 6mm Hg (2-12mm Hg) after RP, and 13.2mm Hg (6-22mm Hg) after mechanical AVR/Konno.

**Summary:** In adults, the RP is a good alternative for mild to moderate aortic root hypoplasia. However for cases with severe obstruction, a Ross/Konno is not possible with the same method of autologous support used in a non-Konno RP, and this could be expected to impact on late durability and the need for further intervention, in a group that have already undergone multiple procedures in childhood. Both methods lead to excellent early and late results. Key words Ross/ Konno procedure, mechanical AVR/Konno operation, Konno aortoventriculoplasty, severe LVOTO obstruction.

## SUTURELESS AORTIC VALVE IMPLANTATION: SINGLE SURGEON EXPERIENCE

Prof HýZýR Mete **Alp**, Dr Taylan Adademir, Dr Fuat BüYüKbayrak, Dr Arzu Antal DöNmez, Dr Ismail Demir, Dr Ekrem YýLmaz

*Kartal Kosuyolu Heart and Research Hospital, Istanbul, Turkey*

**Objectives:** Surgical aortic valve replacement(AVR) is the treatment of choice in patients with severe symptomatic aortic valve stenosis. In recent years, the number of high-risk patients being referred for surgical AVR has increased. A considerable proportion of these patients are deemed operable despite the high risk. In order to modify the risk predominantly associated with duration of cardiopulmonary bypass(CPB) and cross clamp(ACC) time, sutureless aortic valve technology has been developed. They bear the potential of easy implantation, reduced ACC, CPB time. We herein show our experience, focusing on ACC time, early mortality, morbidity, and valve hemodynamic.

**Methods:** A sutureless valve was implanted following sternotomy, extracorporeal circulation, aortic cross clamping, cardioplegic arrest, and removal of the native valve. Optimal annular sealing was obtained with brief low-pressure balloon dilation without suturing. Between January 2012 and August 2015, Sutureless aortic valve was used in 27 patients(mean age,75.1±5.3 years; mean additive euroSCORE,11.9±4.1) with or without concomitant surgery. Hemodynamic parameters and clinical outcome were obtained retrospectively. Results: The patients received sizeS(10),M(13),L(3),XL(1) prosthesis, either as isolated(13) or combined procedures(14). Mean logistic euroSCORE risk evaluation was 33.1±27.1%, mean aortic cross-clamp time was51.1±28.4 minutes(31.6±9.0 minutes for isolated procedures). Mean implantation time was6,8±2.8 minutes. Hemodynamics at discharge showed good function of all sutureless valves with low transvalvular pressure gradients(mean10.8±4.1 mmHg). Thirty-day early mortality was18.5%(5 patients).

**Conclusions:** Sutureless valves are efficient and well-functioning devices that offer the advantage of considerable shortening of the duration of aortic cross clamping. Adequate follow up studies are required to evaluate long term outcome.

## CARDIAC SURGERY IN OCTOGENARIANS: EARLY OUTCOME AND MEDIUM-TERM SURVIVAL

Dr Mohammad **Azari**, Ms Carmel Fenton, Dr Sameer Thakur, Mr Mark Murton, Mr Keshav Bhattarai, Mr Ashutosh Hardikar

*Royal Hobart Hospital, Hobart, TAS*

**Purpose:** We aimed to evaluate the early outcome of cardiac surgery in patients ≥80 years old and their medium term survival.

**Methodology:** A retrospective study was performed and all patients ≥80 years old that have undergone cardiac surgery between April 2008 and April 2016 at our institute were included. Data for all patients were collected prospectively as part of a national database. A dataset of patient demographics, perioperative data, and survival data were collected.

**Results:** During the study period a total of 2,627 patients underwent cardiac surgery, of which, 279 patients were ≥80 years old. Six patients (2.2%) were ≥90 years. Average age was 83±2 years and 66% were males. Isolated CABG (34%) followed by combined AVR and CABG (24%) were the commonest operations performed. Redo cardiac surgery was performed in 7% of patients. The median time of mechanical ventilation was 13h (IQR: 9h) and the median ICU stay was 24h (IQR: 27h). The median length of hospital stay was 8 days. Cerebrovascular accident occurred in 5 patients (1.8%) and

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**References 1.** Data on file, Ethicon Inc. A comparative analysis of the suture hole leak rate of Standard PROLENE® Polypropylene 5-0 Suture, PROLENE® Polypropylene 5-0 Suture with HEMO-SEAL™ technology, and GORE-TEX® EPTFE nonabsorbable monofilament 5-0 suture following an EPTFE to EPTFE vascular graft anastomosis in an ex vivo cardiopulmonary bypass pulsatile flow loop model with heparinized porcine blood.

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## Verbal Abstracts (cont'd)

*Alphabetical order by presenting author's surname.*

7 patients (2.5%) required renal replacement therapy. The overall early mortality was 2.9% (1.0% for isolated CABG and 5.1% for isolated AVR). Multivariate analysis confirmed new renal failure as an independent risk factor for early mortality (P<0.001). Kaplan-Meier analysis estimated the mean survival of 5.7 years (95%CI: 5.1-6.2) after operation. The 8-year survival was 43%. Multivariate analyses showed new renal failure (P=0.001) and stroke (P=0.024) as independent risk factors for medium-term mortality.

**Conclusion:** Cardiac surgery can be safely performed in carefully selected octogenarians with acceptable early morbidity and mortality as well as reasonable medium term survival.

### SINGLE CENTRE EXPERIENCE WITH THE ROSS-KONNO PROCEDURE FOR CRITICAL AORTIC STENOSIS IN THE PAEDIATRIC POPULATION

Dr Thilina **Bandara**, Dr Reece Davies, Dr Yaroslav Mayorchak, Dr Stephanie Chan, Professor Richard Chard

*Westmead Hospital, Sydney, NSW*

**Purpose:** The Ross-Konno procedure provides an option for both aortic valve replacement and annular enlargement in patients with aortic stenosis and annular and subannular hypoplasia, with the particular benefit in the paediatric population of providing the potential for growth with the child. We reviewed our experience with this procedure.

**Methodology:** A retrospective review of prospectively collected data was performed for all patients in whom the Ross-Konno procedure was performed at The Children's Hospital- Westmead between 1992 and 2014. Data was analysed to review pre-operative status, operative variables and post-operative outcomes.

**Outcomes:** There were 22 children whom had a Ross-Konno procedure performed. They had a mean age of 3.5 years (range 5 days-14.1 years) with 68% being male. There were 3 patients (13.6%) having this as their first intervention, while the rest had undergone previous interventions. Mean cardiopulmonary bypass time was 184 minutes (range 110-275 min) and the mean aortic cross-clamp time was 141 minutes (range 123-173 min). There have been 0 mortalities at a mean follow up for 10.5 years. In 4 patients (18.2%) further follow up surgery at a mean of 3.2 years post procedure was required. These were all in early procedures at a mean of 25.75 days. In 3 of these patient's mitral valve repair was required at re-operation.

**Conclusion:** The Ross-Konno procedure is a safe and effective strategy in experienced hands for the definitive management of critical aortic stenosis with annular and/or subannular hypoplasia in the paediatric population.

### TISSUE ENGINEERED BOVINE PERICARDIUM (CARDIOCEL) FOR REPAIR OF CONGENITAL HEART DEFECTS: HISTOPATHOLOGY AND OUTCOMES AT MID-TERM FOLLOW UP

Dr Douglas **Bell**, Dr Sudesh Prabhu, Dr Jane Armes, Dr Robert Justo, Dr Benjamin Anderson, Dr Prem Venugopal, Dr Tom Karl, Dr Nelson Alphonso

*Lady Cilento Children's Hospital, South Brisbane, QLD*

**Purpose:** CardioCel (Admedus, Fremantle, Australia) is bovine pericardium which is subjected to a novel anti-calcification tissue engineering process. We evaluated the mid-term performance of CardioCel for repair of congenital heart defects with particular focus on the histological examination of explanted specimens.

**Methodology:** CardioCel was implanted in 140 paediatric patients (194 implants) from October 2012 to November 2014. There were 99 (51%) simple septations and 95 (49%) complex three-dimensional reconstructions. There were 6 deaths (4.6%), none directly related to CardioCel. Median follow up was 591 days. Six explants were evaluated histologically.

**Results:** There were 9 (4%) adverse events related to CardioCel. 8 patients required 11 reinterventions, all for indications other than simple septation (p=0.001). In all 6 explants there was no calcification and an inflammatory response was seen only in the surrounding native tissue. A neo-intima developed on the visceral surface. In the patient with the longest implant duration (502 days) endothelial cells were identified on the surface of the neo-intima. A granulation tissue layer developed on the parietal surface. There was temporally related fibroblastic invasion and the laminated native collagen fiber architecture was maintained in all the grafts. New collagen fibers and scattered capillary vessels were seen lying between native CardioCel laminated collagen. This is consistent with early remodeling in the CardioCel patch.

**Conclusion:** CardioCel produces acceptable mid-term results when used for repair of congenital heart defects. It appears to perform better when used as a simple patch. Evidence of graft remodelling was noted in all explants.

### EFFECT OF AGEING ON DONATION AFTER CIRCULATORY DEATH (DCD) HEART IN RODENT MODEL

Dr Hong Chee **Chew**, Dr Ling Gao, Dr Jeanette Villanueva, Dr Mark Hicks, Assoc. Professor Kumud Dhital, Professor Peter Macdonald

*Victor Chang Cardiac Research Institute, Sydney, NSW*

**Aim:** To investigate the effect of ageing on functional recovery of hearts undergoing DCD withdrawal in rodents.

## Verbal Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methodology:** Male Wistar rats (3mo and 12mo) were subjected to DCD withdrawal. Rats were anaesthetised and open carotid cannulation performed for continuous pressure monitoring; pulse oximetry for saturation and heart rate monitoring. Trachea was ligated, followed by 12mins of warm ischaemia(WIT). 500IU heparin was given IV after withdrawal. After WIT, heart was excised and topically cooled to 4oc. Heart was prepared and installed on ex-vivo circuit with aortic and left atrial cannulation. Retrograde preservation flush(100ml) at 4oC was given via aortic cannula at rate of 20-30ml/min. The heart was reperfused with 37oc Krebs buffer and kept on Langendorff for 30min followed by functional assessment in 'working' mode for 30 min. Aortic flow(AF), heart rate(HR) and pressure(MAP) was measured using PowerLab™; Coronary effluent was collected at 5min intervals and constitutes coronary flow(CF). Cardiac output (CO) = AF + CF. All data analysed with ANOVA and post-hoc test. 5 groups (n=6/group): 1. 3mo, celsior (3C) 2. 3mo, celsior + GTN + Erythropoietin + Zoniporide (3Cs) (n=6) 3. 12mo, celsior (12C) 4. 12mo extended, celsior (12ExC) * 5. 12mo extended, celsior + GTN + Erythropoietin + Zoniporide (12ExCs) * (*extended – WIT = 20 minutes)

**Results:** CF (ml) AF (ml) CO HR (bpm) MAP (mmHg) 3C 16.8±3.2 6.6±8.2 23.4 251±46 54±25 3Cs 16.7±3.6 13±12.4 29.6 240±44 82±11 12C 23.8±2.6 36.2±11 60 203±30 78±16 12ExC 15.5±9.8 13.2±12 28.7 181±42 57±30 12ExCs 22.2±5.6 22.7±19.1 44.9 211±43 78±13 12C show better recovery at WIT of 12min, but comparable recovery when WIT extended to 20min. 3CS and 12ExCs show superior recovery to their non-supplemented counterpart.

**Conclusion:** 12m rats exhibit superior ischaemic tolerance to 3m rats. Addition of supplements further improve cardiac recovery in both age group. Future experiments with 18m rats to assess if ageing provides similar ischaemic protection.

### BANKED BLOOD IN THE RECOVERY OF DONATION AFTER CIRCULATORY DEATH (DCD) HEARTS IN A PORCINE MODEL

Dr Hong Chee **Chew**, Dr Ling Gao, Dr Jeanette Villanueva, Dr Mark Hicks, Assoc. Professor Kumud Dhital, Professor Peter Macdonald

*Victor Chang Cardiac Research Institute, Sydney, NSW*

**Aim:** To investigate the functional outcomes of porcine heart during normothermic machine perfusion (NMP) comparing banked blood to donor blood reperfusion, and the metabolic disturbances during the early stages of NMP.

**Method:** Landrace pigs (n=12) were subjected to circulatory arrest to mimic clinical DCD. Group 1 (DB; n=6), 1-1.2 litres of donor blood was collected after cessation of circulation for reperfusion of heart on ex-vivo device; Group 2 (BB; n=6), 1-1.2 litres of banked blood was used to reperfuse the heart on the same device. Baseline metabolic features of the blood were established in each group using handheld i-Stat system, and corrected prior to installation of heart for reperfusion. Functional outcomes measured include aortic flow (AF), coronary flow (CF) and mean aortic pressure (MAP). In both groups, reperfusion of organ was sustained for at least 4 hours unless unfavourable lactate changes.

**Results:** Metabolic profile of donor blood compared to banked blood reveals significant acidosis (pH 7.53 ± 0.04 vs 6.53 ± 0.04) and electrolyte derangement (K+ 4 ± 0.5 vs 8.9 ± 0.3; Ca2+ 1.32 ± 0.03 vs <0.25; HCO3- 33.8 ± 1.3 vs 0) which requires vigorous correction prior to installation of heart for NMP. Functional outcomes show a significantly higher MAP and AF in banked blood group to achieve a similar coronary flow (MAP 62.3 ± 7.6 vs 98.2 ± 30.5mmHg; AF 0.78 vs. 0.86L/min; CF 0.75 vs 0.71L/min). Lactate profile in both groups remain favourable. However, duration of NMP in the banked blood group is shorter (t= 224 ± 65mins vs 305 ± 46mins).

**Conclusion:** Donor blood remains superior for the reperfusion of hearts in NMP, however, recovery is achievable using banked blood with vigorous correction of metabolic disturbances. It appears however, components within banked blood induce coronary vasoconstriction during NMP.

### CHRONIC KIDNEY DISEASE IS ASSOCIATED WITH POOR OUTCOMES AFTER ISOLATED CORONARY ARTERY BYPASS GRAFTING

A/Prof Andrew **Cochrane**, Mohammed Alramadan, Professor Christopher Reid, Ms Lavinia Tran, Professor Julian Smith, Dr Baki Billah

*Dept of Cardiothorcic Surgery, Monash Medical Centre, Melbourne, VIC*

**Purpose:** To examine the effect of different stages of chronic kidney disease (CKD)on the post-operative mortality and complications after isolated coronary artery bypass grafting (CABG), using a large cohort from the Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) database.

**Methods:** Data from 31,250 patients who underwent CABG between 2001 and 2011 was analysed. Following calculation of the preoperative glomerular filtration rate (eGFR) patients were classified into 5 stages of CKD: normal (eGFR > 90 ml/min/1.73m2), mild renal impairment (eGFR 60 to 89), moderate (eGFR 30 to 59), severe (eGFR < 30 ml/min/1.73m2) and dialysis dependent. The relationship between the stage and outcomes was analysed by univariate regression, and then by multivariable logistic and Cox regression using the known risk factors in the AusScore II model, a predictive model of 30-day mortality developed from the same database.

**Results:** Almost 77% of isolated CABG cases had some degree of CKD - mild 50.3%, moderate 22.7%, severe 2.3%, and dialysis dependent 1.5%. Compared to patients with normal eGFR, the adjusted risk for 30-day mortality increased with stage of CKD from mild (1.8 fold, 95% CI: 1.3-2.6) to dialysis dependent (4.4 fold, 95% CI: 2.4-8.2). The return to OR, prolonged ventilation, prolonged hospital stay, sepsis and

## Verbal Abstracts (cont'd)

*Alphabetical order by presenting author's surname.*

need for transfusion were all increased with the stage of CKD. Late survival also decreased with CKD stage, from 10-year survival of 85% in normal eGFR to 45.5% for severe CKD (see figure). Patients on dialysis had a better outcome on some measures than those with severe CKD without dialysis.

**Conclusions:** Poor kidney function was a strong independent predictor for 30-day mortality and for many post-operative complications. In addition, late survival was significantly reduced. The high frequency of CKD means that these findings should be considered in all discussions and decisions regarding CABG surgery.

### THE NON-EJECTING HEART ON VA ECMO: STRATEGIES FOR VENTING THE LEFT HEART

Dr Neil **Curran**, Dr Maithri Siriwardena, Dr Mark Connellan, Dr Paul Jansz, Dr Phillip Spratt, Dr Kumud Dhital, Dr Priya Nair, Dr Emily Granger

*St Vincent's Hospital, Sydney, NSW*

**Background:** Veno-Arterial Extracorporeal Membrane Oxygenation (VA-ECMO) is a potentially life-saving, cardio-respiratory support intervention for patients in refractory cardiogenic shock. VA-ECMO provides end organ perfusion, enabling bridging to recovery, durable assist device implantation or cardiac transplantation. VA-ECMO patients with minimal, cardiac contractility and inadequate left ventricular (LV) ejection are prone to elevated LV pressures, LV distension and pulmonary oedema. Furthermore, the high afterload on the distending LV may severely impair myocardial recovery and significantly increase the risk of intra-cardiac thrombus formation. Direct venting of the left heart is usually required in these circumstances. Currently there is no clear consensus for the optimal venting timing or strategy.

**Methodology:** We reviewed the prospective database of VA-ECMO cases at our institution from 2009-2016. The methods for venting, the patient characteristics and outcomes were determined with a review of notes, radiology and echocardiography.

**Results:** A total of 213 patients required VA-ECMO. 11 patients (5.2%) required venting. 11 vents were inserted surgically and 1 percutaneously. 8 patients (73%) had no ejection seen on echo with closed aortic valves. Mean duration of venting was 76.2±17.2 hours. Predicted survival for this cohort was 38.5±4.3%, as calculated their SAVE-ECMO risk score. Actual survival was 6 of 11 patients (55%).

**Conclusion:** LV distention on VA-ECMO delays myocardial recovery and increases risk of life threatening complications. Monitoring LV function is imperative and the non-ejecting heart requires prompt venting. Overall, non-ejecting hearts on VA-ECMO predict severe myocardial injury and poor prognosis.

### DEEP STERNAL WOUND INFECTIONS – IMMEDIATE STERNAL FIXATION OR VAC & FLAP?

Dr Yuvaraj **Davidson** Thyagarajan Abraham, Mr Tharumenthiran Ramanathan

*Auckland District Health Board, Auckland, New Zealand*

**Purpose:** Deep sternal wound infections (DSWI) following cardiac surgery are associated with increased mortality, morbidity, length of hospitalisation and cost. The optimal management of DSWI is controversial. We sought to investigate the results of immediate sternal fixation versus negative-pressure wound therapy (NPWT) and delayed flap closure.

**Methodology:** A retrospective review of patients treated for DSWI between 1 June 2013 and 31 May 2016 at the Green Lane Cardiothoracic Unit, Auckland City Hospital was performed. Patients were divided according to treatment modality: immediate sternal fixation or NPWT and flap closure. An intention to treat analysis was performed comparing continuous variables with the Wilcoxon Rank Sum test and categorical variables with the Fisher's Exact test.

**Results:** The incidence of DSWI during the study period was 1.57% (44/2808). 24 patients underwent immediate sternal fixation and 13 NPWT and flap closure. 7 who underwent other treatment options were excluded. The two groups were comparable in age, BMI, diabetic status and left ventricular ejection fraction. There were more women in the flap group (p=0.0033). Fewer operative procedures were required in the immediate sternal fixation group (median 1 procedure versus 3 procedures in the NPWT and flap group) (P=0.0059). Importantly, the overall duration of hospitalisation was more than halved in the immediate sternal fixation group (NPWT and flap group median 82 days to sternal rewiring group median 36.5 days (P=0.0003).

**Conclusion:** NPWT and delayed flap closure should be used judiciously. In selected patients immediate sternal fixation is a viable option associated with fewer operative procedures and shorter hospitalisation.

### SINGLE CENTRE OUTCOMES OF THE INTUITY RAPID DEPLOYMENT AORTIC VALVE: AN AUSTRALIAN EXPERIENCE

Dr Reece **Davies**, Dr Thilina Bandara, Dr Omar Aziz, Dr Yishay Orr

*Westmead Hospital, Sydney, NSW*

**Purpose:** The Edwards Intuity Rapid Deployment Valve System is a relatively new option available for aortic valve replacement, receiving TGA approval in 2014. It requires fewer sutures than traditional valves and therefore is claimed to be associated with reduced operative times. We sought to review our experience with this newly available therapy.

## Verbal Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methodology:** A retrospective review of prospectively collected data was performed for all patients in whom Intuity valve implantation was attempted at our institution since July 2014. Data was analysed to review pre-operative status, operative variables and post-operative outcomes.

**Outcomes:** There were 69 attempted insertions of Intuity valves identifed- 66 successful and 3 unsuccessful. Mean age was 77 years (95% CI: 75-79); 65% were males; mean EuroSCORE II was 5.9 (95% CI: 4.1-7.6) with 13 patients having a EuroSCORE II ¡Ý 9. Mean cardiopulmonary bypass time was 95.4 minutes (95% CI: 82.0-102.1), mean aortic cross-clamp time was 71.1 minutes (95% CI: 60.2-76.2) and 36 patients (52.1%) had concomitant procedures. Early mortality occurred in 5 patients (7.2%) with a mean Euroscore II of 9.7. Mean post-operative ventilation time was 37.9 hours (95% CI: 22.4-53.4), mean post-operative drain losses at 4 hours was 363ml (95% CI: 290-435), a mean of 2.4 units of red cells were transfused (95% CI:1.84-3.06), 3 patients required dialysis (4.3%) and 6 patients (8.7%) required implantation of a pacemaker post-operatively.

**Conclusion:** Intuity Rapid Deployment aortic valves offer a new option for aortic valve surgery which allow safe outcomes in high risk population groups in an Australian setting. Further experience and comparative research is required on these relatively new devices.

### INFECTIVE ENDOCARDITIS; A HUNTER NEW ENGLAND PERSPECTIVE

Dr Fiona **Doig**, Dr Mark Loewenthal, Dr Katy Lai, Dr A Iyengar, Dr R Mejia

*John Hunter Hospital, Newcastle, NSW*

**Purpose:** Infective endocarditis (IE) is a severe infection conferring significant morbidity and mortality. It is associated with geographical variation, complicating diagnosis and treatment of patients in a standardized manner. The objective of this study was to evaluate the incidence, risk factors and variables affecting the outcomes of patients with IE in the Hunter New England Local Health District (HNELHD).

**Methods & Results:** A total of 112 patients with definite IE admitted to hospitals within the HNELHD between 2011 and 2015 were retrospectively analysed. The mean age of patients was 56.8 (SD 20.3) and 62.5% were male. 1-year mortality was 25%, with 13% during the index admission. The most common valve affected was the mitral valve, in 40% of patients and the most common organism was MSSA, in 48% of patients. Valve type and organism type did not have a statistically significant effect on mortality (p-value 0.095 and 0.456 respectively). A past history of IE was present in 10% of patients and 20% presented with prosthetic valve IE. ASGC Remoteness Area did not have a statically significant effect on 1-year mortality (p-value 0.186). 34% of patients underwent cardiac surgery during the index admission and this was associated with a statistically significant difference in 1-year mortality compared to medical therapy (8.8% and 32%, p-value 0.006), which was also true of patients managed by a multidisciplinary team (ID, cardiology and cardiothoracic surgery) (p-value 0.04).

**Conclusions**: IE in the HNELHD affects a relatively young cohort of patients and is associated with a high mortality. Outcomes are improved by implementation of a multi-disciplinary team approach and inpatient cardiac surgery.

### BILATERAL VERSUS SINGLE INTERNAL THORACIC ARTERY GRAFTING IN DIABETIC AND OLDER PATIENTS WITH TRIPLE VESSEL DISEASE: ANALYSIS OF A MULTICENTRE DATABASE

Prof Andrew Newcomb, Dr James **Farag**, Dr Eric Lo, Dr William Shi, Dr Hayley Barnes, Mr Prashant Joshi, Mr Philip Davis, Ms Lavinia Tran, Mr Christopher Reid, Prof Julian Smith

*Department of Epidemiology and Preventive Medicine, Melbourne, VIC*

**Background:** Use of bilateral internal thoracic arteries (BITA) is associated with improved long-term survival compared to a single internal thoracic artery (SITA), despite its low penetrance in clinical practice. Such a strategy is arguably less desirable in patients who are older and those who have diabetes, due to a perceived increase in peri-operative risk with limited prognostic gain associated with BITA. As such, we sought to examine the prevalence and outcomes of BITA use in this subset of patients.

**Methods:** From 2001 to 2013, 25900 patients at 28 centres with three-vessel coronary disease underwent primary isolated coronary artery bypass grafting (CABG) using at least a single ITA. BITA use was 12% overall, 15% (n=2379) in those under 70 years of age (n=15879) and 6.6% (n=661) in those over 70 years (n=10016), p <0.001. Amongst those with diabetes (n=7948), BITA use was 7.4% (n=590). Separate propensity-score matched analyses were conducted for the following subsets: 1) over 70 years of age, 2) under 70 years of age and 3) those with diabetes (treated with either oral agents or insulin). The National Death Index was used to determine survival.

**Results:** In the propensity-score matched analysis comparing single versus bilateral ITA in those over 70 years of age (619 matched pairs), there was comparable rates of sternal infection (1.1% vs. 2.1%, p=0.26) but a trend towards higher 30-day mortality (SITA: 1.1% vs. BITA: 2.7%, p=0.064). Survival at 8 years was also comparable (SITA: 74±3.2% vs. BITA: 72±3.1%, p=0.88). In the analysis amongst patients under 70 (2193 matched pairs), 30-day mortality was similar (SITA: 0.3% vs. BITA: 0.5%, p=0.48), however BITA patients experienced higher rates of sternal infection (0.8% vs. 1.8%, p=0.008). Survival at 8 years was nonetheless comparable (SITA: 92±1.3% vs. BITA: 92±0.9%, p=0.29). Amongst patients with diabetes (564 matched pairs), 30-day mortality was

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comparable (SITA: 0.9% vs. BITA: 2.0%, p=0.21), as was sternal infection (2.5% vs. 4.1%, p=0.18). Survival was similar at 8 years (BITA: 84±2.7% vs. SITA: 78±3.8%, p=0.47).

**Conclusions:** Use of bilateral internal thoracic arteries remains relatively uncommon, especially in older patients and those with diabetes. It is associated with increased rates of deep sternal infection although early mortality was comparable. Mid-term survival was comparable between patients receiving either single or bilateral internal thoracic artery grafting. As such, the benefit of bilateral ITA grafting may lie only in those with longer life expectancies.

### LOBECTOMY IN SEPTUAGENARIANS WITH NON-SMALL CELL LUNG CANCER: OPEN VS VATS APPROACH

Laura **Fong**, Viktor Ko, Aden Mclaughlin, Kate Denning, Louis Okiwelu, Mark Newman, Jurgen Passage, Lucas Sanders, Pragnesh Joshi

*Sir Charles Gairdner Hospital, Nedlands, WA*

**Purpose:** With the ageing population, surgeons are increasingly faced with the decision of whether to operate on elderly patients with resectable non-small cell lung cancer (NSCLC). We reviewed the outcomes of septagenarians who underwent lobectomy via a video-assisted thoracic surgery (VATS) approach versus open thoracotomy to determine their outcomes.

**Methodology:** We conducted a retrospective single-institution review of patients aged 70 years or greater who underwent a lobectomy or pneumonectomy for NSCLC from January 2010 to June 2016. Post-operative outcomes including complication rates, length of hospital stay and long-term follow-up were analysed. Complications included post-operative arrhythmia, myocardial infarction, respiratory failure, cerebrovascular events, infection, prolonged airleak, delirium, readmission and 30-day mortality.

**Results:** 100 septuagenarians underwent lobectomy: 76 VATS and 24 via open thoracotomy. Mean age of patients was 76 years (range 70 to 87 years). VATS patients had fewer complications (38.2% vs 44.8%). Compared with thoracotomy, VATS patients had a shorter mean length of stay (4.9 vs 9.3 days) and were less likely to require admission to an intensive care unit (1.4% vs 4.2%)

**Conclusion:** Septuagenarians with NSCLC can undergo curative lung resection with acceptable post-operative risk. The VATS approach to resection resulted in a shorter length of hospitalisation and less morbidity compared to an open approach.

### OUTCOMES OF THE ARTERIAL SWITCH OPERATION IN PATIENTS WITH CONCOMITANT AORTIC ARCH OBSTRUCTION AS A SINGLE STAGE REPAIR

Dr Tyson **Fricke**, Dr Ben Loyer, Dr Phillip Naimo, Dr Terry Robertson, Dr Andrew Bullock, A/Prof Yves D'Udekem, A/Prof Christian Brizard, Prof Igor Konstantinov

*The Royal Children's Hospital, Melbourne, VIC*

**Purpose:** We sought to determine outcomes of patients who underwent arterial switch operation (ASO) with concomitant aortic arch obstruction (AAO) repair as a single stage procedure.

**Methodology:** All patients who underwent an ASO since 2008 were identified from a single institution's database and reviewed retrospectively. Aortic arch obstruction was defined as coarctation of the aorta, hypoplastic aortic arch or interrupted aortic arch.

**Results:** From 1983 to 2008, 666 patients underwent an ASO for biventricular repair at our institution. Sixty three (9.5%, 63/666) patients who underwent ASO had AAO. Thirty five (55%, 35/63) patients had AAO repair at time of ASO as part of a single stage repair. Of these 35, twenty one (60%, 21/35) had transposition of the great arteries and 14 (40%, 14/35) had Taussig-Bing anomaly. There were 2 (5.7%, 2/35) hospital deaths in these patients compared to an overall hospital mortality of 2.9% (19/666). No patients required reoperation during hospital admission. Follow-up was available for 32 (97%, 32/33) survivors. Mean follow up was 11.2 years (range 7 months to 31 years). There were no late deaths. Three (9.4%, 3/32) patients required 4 late reoperations. Two (6.3%, 2/32) patients had moderate neo-aortic valve regurgitation (AR) at last follow-up. Two (6.3%, 2/32) patients required neo-aortic root valve replacement for severe AR. All survivors were in New York Heart Association Class I at last follow-up.

**Conclusion:** Patients who go undergo ASO with associated AAO as a single stage repair have good early outcomes. Excellent survival and a low reoperation rate continues into adolescence and young adulthood. Close follow-up of neo-aortic valvular regurgitation is warranted.

### LONG-TERM OUTCOMES COMPARISON OF MITRAL VALVE REPLACEMENT VERSUS REPAIR IN ELDERLY PATIENTS

Dr Anthony **Furnary**

**Objective:** To compare survival and postoperative valve durability following mitral valve replacement and repair (MVR/r) in patients > 70 years-old in order to better inform optimal operative decision-making.

**Methods:** All patients undergoing MVR/r at our institution since 1960 have been prospectively followed for survival and explant on an annual basis. Expected survival was calculated for each patient from age-gender-operative year-matched

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US life tables. Observed and Expected survival curves were plotted and compared using Standardized Mortality Ratio (SMR = total observed deaths/total expected deaths). The cumulative incidence function (CIF) was used to determine valve explant rates at 12 years.

**Results:** There were 771 patients >70 years of age at time of isolated MVR/r (1971-2015) with 5,126 patient-years of follow-up. The survival and explant outcomes of all mitral repairs (MVr, 375) and MVR with mechanical (170), porcine (118) and pericardial (103) implants were compared. (Table) There were no significant differences in age, gender or incidence of CABG. Observed survival for porcine and mechanical MVR was very much worse than expected (SMR=2.0 and 1.7 respectively, P<0.001 for both); slightly worse than expected for MVr (SMR=1.16; 95%CI=1.02-1.37); whereas survival following pericardial MVR was equal to expected (SMR=1.2; 95%CI=0.89-1.75). However, the cumulative incidence of redo mitral surgery or prosthetic valve explant at 14 years was 0% for pericardial MVR, which is equal to (significantly LESS THAN ) mechanical MVR (2%), but significantly lower than that for mitral repair (8%) and porcine MVR (7.5%).

**Conclusions:** In patients > 70 years old, mitral repair, mechanical MVR and porcine MVR do not restore expected survival, whereas pericardial MVR restores expected survival. However the incidence of redo mitral surgery following MVr is significantly higher than that following pericardial MVR. These data suggest that the long term outcomes of pericardial MVR may be superior to native MVr for patients >70 years old, as pericardial MVR both preserves survival and minimizes reoperation.

### FRAILTY ASSESSMENT IN CARDIAC SURGERY: A NEW PARADIGM IN PREOPERATIVE RISK STRATIFICATION

Mr Christopher **Harris**, Dr Akshat Saxena, Prof Paul Bannon

*The University of Sydney, Sydney, NSW*

**Introduction:** Existing risk stratification tools, such as the STS model, are useful in quantifying a patient's preoperative risk of adverse surgical outcomes, however their accuracy and use are limited in complex, elderly and potentially frail patients. This pilot study aimed to evaluate five different frailty scores in their prediction of 30-day postoperative mortality or major morbidity.

**Methods:** Between August 2015 and February 2016, a prospective cohort of patients aged 70 years and over and scheduled for cardiac surgery was recruited from the Royal Prince Alfred Hospital Medical Centre. Five frailty scores were generated for each patient, including gait speed, grip strength, FORECAST, MMSE and MFS scores. Primary endpoint data included 30-day postoperative mortality and major morbidity, comprising stroke, renal failure, deep sternal wound infection, prolonged ventilation and reoperation.

**Results:** From an overall cohort of 31 patients, there was shown to be a small but significant decrease in gait speed over five metres in patients suffering overall mortality or major morbidity (4.99 ± 0.74 secs vs 4.18 ± 0.92 secs, p=0.0201). When patients were stratified into normal and slow gait speed groups based on a cut-off time of five seconds, a chi-squared test showed a significantly increased rate of overall morbidity in the slow gait speed group (p=0.0284). There was no significant difference in STS-PROMM scores between groups stratified by gait speed, suggesting that slow gait may be an independent risk factor for major morbidity.

**Conclusions:** The significant correlation between slow gait speed and postoperative morbidity in this cohort suggests a potential role for gait speed testing alongside existing risk models to identify high-risk elderly patients prior to cardiac surgery.

### LONG TERM OUTCOMES FOR PATIENTS RECEIVING CONSECUTIVE BIOPROSTHETIC AORTIC VALVE REPLACEMENT

Dr Matthew **Haydock**, Mrs Carissa Wilkes, Mr Indran Ramanathan, Mr David Haydock

*Green Lane Cardiothoracic Surgical Unit, Auckland, New Zealand*

**Background:** Worldwide there's increased use of bio-prosthetic valves in the aortic position. Part of this increase has been patient driven for quality of life reasons. More recently bio-prosthetic valves are chosen by progressively younger patients with the strategy to perform a valve-in-valve TAVI if they should wear out. Therefore we reviewed our experience with patients whose first two aortic valve replacements (AVR) were with bio-prosthetic valves.

**Methods:** Patients receiving consecutive bio-prosthetic AVR performed by the Green Lane Cardiothoracic Surgical Unit were identified from a departmental database. Data retrieved from prospective databases, electronic and archived clinical records. Outcomes of interest were overall survival and freedom from third or more AVR.

**Results:** 267 patients met inclusion criteria with a mean follow up of 22.3 years. Concurrent procedures (CABG etc.) were performed in 65.2% of patients that underwent two bio-prosthetic AVR and 79.8% of patients undergoing three or more bio-prosthetic AVR. Median survival of the cohort was 31.7 years. Age at operation was the best predictor of needing a third or more AVR. ROC analysis identifies that being younger than 45 at first operation and 56 at second operation as the optimal cut off point for likelihood of needing a third or more aortic valve intervention.

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**Conclusion:** Overall survival for consecutive bio-prosthetic AVR is remarkably good. Data on consecutive bio-prosthetic AVR is of particular relevance to the evolution of TAVI and valve-in-valve TAVI. However it must be noted that the majority of patients in this cohort required concurrent cardiac surgical procedures. This study provides encouraging data for consecutive bio-prosthetic AVR and data that may be applicable in the setting TAVI being performed in younger cohorts of patients.

### PERCUTANEOUS APPROACH TO THE MITRAL VALVE: THE PRINCE CHARLES EXPERIENCE

Dr Cheng **He**, Dr Darren L. Walters, Dr Gregory Scalia, Dr Andrew Clarke

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** Open-heart surgery remains the gold standard for the treatment of severe mitral valve disease. The modern challenge facing surgeons, to provide a safe intervention for the rising population of high-risk patients presenting for either primary or redo surgery, has led to the development of novel percutaneous approaches to the mitral valve. We describe our initial experience with transcatheter mitral valve replacements in high-risk patients.

**Methodology:** Ten patients (mean age 82±2 years) received transapical transcatheter mitral valve implantation between February 2011 and June 2016. All patients were considered high risk for conventional surgery after evaluation by a multidisciplinary heart team. Implantation of a balloon-expandable heart valve (Sapien) into a degenerated mitral valve bioprosthesis was performed in four patients, whilst six received a self-expanding bioprosthesis (Tendyne) for severe mitral regurgitation.

**Results:** Implantation was successful in all patients, with reduction of median mitral regurgitation from grade 4 (IQR: 3-4) to 0 ($p<0.01$). Trace paravalvular regurgitation was seen in 3 patients. In-hospital mortality occurred in 2 patients due to stroke and septic shock, on postoperative days 3 and 13, respectively. Length of stay was 10 (IQR: 8-12) days. NYHA class improved from 3 (IQR: 3-4) to 2 (IQR: 1.5-2, $P<0.01$) over a median follow-up of 30 (range 30-958) days.

**Conclusion:** Transapical transcatheter mitral valve replacement may provide an alternative strategy to deal with the increasing rise of high-risk patients presenting for primary and reoperative mitral valve surgery. Our initial experience with this approach has demonstrated its early feasibility in select patients.

### EARLY OUTCOMES OF RAPID DEPLOYMENT AORTIC VALVE REPLACEMENT: THE PRINCE CHARLES EXPERIENCE

Dr Cheng **He**, Dr Yilin Lincoln Chen, Dr Douglas Wall, Dr Andrew Clarke, Dr Peter Tesar, Dr Rishendran Naidoo

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** Rapid deployment aortic valve replacement (RD-AVR) is an important strategy to optimise the established success of surgical AVR. We describe our early-term experience with the Edwards Intuity and Sorin Perceval valves.

**Methodology:** From May 2013 to June 2016, prospective data was collected for all patients undergoing RD-AVR via a median sternotomy at The Prince Charles Hospital, Brisbane.

**Results:** Eighty-two patients, with a mean age of 76±5.8 years, underwent RD-AVR (Perceval = 54, Intuity = 28). Concomitant procedures were performed in 26 patients. Mean echocardiographic follow-up was 305 days (range 5-817 days). The mean logistic Euroscore was 8.0±4.0. The Intuity cohort had shorter aortic cross-clamp times (Intuity: 30±5.9 mins vs. Perceval: 35.6±10.8 mins, P=0.03). After accounting for the staggered introduction of the Intuity valve to our unit, there was no difference in aortic cross-clamp time during the latter period of our experience (Intuity 30.1±5.0 mins vs. Perceval 28.3±6.5 mins, P=0.39). No in-hospital mortality was encountered. Postoperative hospital stay was shorter in isolated Perceval AVR (9.1±4.9 days vs. Intuity: 14.4±14.2 days, P=0.04). The incidence of stroke and transient neurological complications was 1.2% each. Postoperative permanent pacemaker was inserted in nine (11%) patients. One patient had moderate paravalvular leak on discharge TTE, which spontaneously disappeared at 12 months follow-up. Haemodynamic performance of both prostheses remained satisfactory up to 24 months postoperatively.

**Conclusion:** Intuity and Perceval devices demonstrate safe implantation in high-risk patients with satisfactory early-term haemodynamic results.

### RELATIONSHIP BETWEEN AMOUNT OF TISSUE RESECTION AND OUTCOME FOLLOWING SURGICAL SEPTAL MYECTOMY FOR LVOT OBSTRUCTION: THE PRINCE CHARLES EXPERIENCE

Dr Peter Tesar, Dr Cheng **He**, Dr Douglas Bell, Dr Christina Mew, Dr Catherina Tjahjadi, Dr Ryan Markham, Dr Dong Kang

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** Surgical septal myectomy is the gold standard for septal reduction therapy in patients with dynamic LVOT obstruction. We present our institution experience and further examine the relationship between extent of septal resection and outcomes.

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**Methodology:** From January 2002 to May 2015, prospective data was collected for all patients undergoing surgical septal myectomy at The Prince Charles Hospital, Brisbane. Haemodynamic outcomes were correlated with extent of myectomy by tissue volumes resected.

**Results:** Fifty-nine patients, with a mean age of 53±19.3 years, underwent surgical septal myectomy for LVOT obstruction. Concomitant procedures were performed in 26 patients. Mean echocardiographic follow-up was 2.6 years (range 0-10 years). There was no in-hospital mortality. The cumulative incidence of death was 0% and 3.4% at 1 and 5 years postoperatively. Interventricular septal thickness decreased by 22% ($P<0.01$) and 16% ($P<0.01$) at discharge and 5 years. Peak LVOT gradient decreased from 67.9±46.3 mmHg to 12.7±16.5 mmHg at discharge ($P<0.01$), to 4.5±1.2 mmHg ($P<0.01$) at 5 years. Mitral leaflet SAM resolved in all patients after surgery. Changes in septal thickness and LV dimensions correlated with extent of myectomy.

**Conclusion:** Surgical septal myectomy demonstrates good relief of LVOT obstruction, with results remaining satisfactory at intermediate-term follow-up. The extent of myectomy correlated with echocardiographic changes in LV and septal dimensions, but no relationship was observed with regards to the decrease in peak LVOT gradient. The shift in surgical paradigm, from the Morrow to the Schaff technique, has helped ensure good outcomes in spite of the evolution in patient septal profiles.

### COMPARING VIDEO ASSISTED THORACOSCOPIC LOBECTOMY WITH OPEN LOBECTOMY: RESULTS FROM A HIGH VOLUME UK CENTRE

Dr Alfred **Hing**, Mr Michael Shackcloth, Mr Steven Woolley

*Liverpool Heart and Chest Hospital, Merseyside, United Kingdom*

**Purpose:** Despite its reported benefits over open surgery, video assisted thoracoscopic (VATS) lung resections still make up <50% of cases in many countries. In the United Kingdom, the SCTS thoracic registry data reported VATS resection made up 40% of all lobectomies for lung cancer in 2014-15. This study examines the experience and outcomes of VATS versus open lobectomy in a single high volume centre.

**Methodology:** A retrospective review of our institution's thoracic surgery database was undertaken to examine the results of lobectomies performed from December 2010 to July 2016. Complex lung resections were excluded from this study. Morbidity, lymph node and tumour staging, and mortality were investigated between groups.

**Results:** 469 VATS and 1237 open lobectomies were examined. The average age was 69 yrs (31-89) and 68 yrs (14-90) respectively. 10% of VATS patients were octogenarians vs 8.6% in the open group. Average preoperative FEV1 values were 87% and 86% predicted. Median length of stay was 4 days (VATS) vs 6 days (open); critical care re-admission 2.63% vs 5.58%; and in-hospital mortality 0.21% vs 2.26%. Atrial fibrillation occurred in 5.97% (VATS) vs 5.66% (open), and prolonged air leak in 4.48% vs 6.47%. R0 resection was achieved in 100% (VATS) vs 99.35% (open). Numbers and site of lymph nodes sampled at time of surgery were also assessed.

**Conclusion:** VATS lobectomy is safe in our institution and is increasing as a proportion of total lung resections. Patient demographics were comparable between groups. Length of stay and in-hospital mortality were both significantly decreased in the VATS group. Rates of AF were similar with a trend towards decreased air leak in the VATS group.

### COMPARING OUTCOMES OF MULTIPLE ARTERIAL GRAFTING WITH LEFT INTERNAL MAMMARY ARTERY AND SAPHENOUS VEIN GRAFTING IN CORONARY ARTERY BYPASS SURGERY: A SINGLE LARGE VOLUME UK CENTRE EXPERIENCE

Dr Alfred **Hing**, Mr Matthew Shaw, Prof Aung Oo

*Liverpool Heart and Chest Hospital, Merseyside, United Kingdom*

**Purpose:** Despite literature demonstrating superiority of arterial grafts over saphenous vein grafts (SVG), there is still low usage of arterial grafting in coronary artery bypass surgery. Less than 10% of patients on the Society of Thoracic Surgeons cardiac database received a second arterial graft and its use remains a matter of debate. We examined the experience of arterial revascularisation versus left internal mammary artery (LIMA) and SVG at our institution, and their outcomes.

**Methodology:** A retrospective review of our institution's cardiac surgery database (1998-2016) with propensity score matching was undertaken to compare outcomes of 2 or more arterial grafts versus LIMA+SVG. Data for this database is prospectively entered.

**Results:** There were 3,888 multiple arterial grafting (MAG) and 10,111 LIMA+SVG patients. After propensity matching, 3,206 patients were identified in each group. There were no significant differences in pre-operative characteristics between groups. There were no differences between groups in post-operative acute renal failure, stroke, deep sternal wound infection or in-hospital mortality. Post-operative myocardial infarction was higher in the MAG group and atrial arrhythmias higher in the LIMA+SVG group. Matched 15 year survival curves demonstrated no significant differences between groups.

**Conclusion:** Within the limitations of this study, we have found that in our centre, the choice of conduit does not affect survival for up to 15 years. There were also no differences in most in-hospital complications between groups. In spite of international literature reporting that arterial revascularisation is associated with better outcomes, we were unable to demonstrate this in our patient cohort.

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## DOES THE CEREBRAL PROTECTION STRATEGY ALTER OUTCOMES IN ACUTE TYPE A AORTIC DISSECTION REPAIR?

Dr Alfred **Hing**, Mr Matthew Shaw, Prof Aung Oo

*Liverpool Heart and Chest Hospital, Merseyside, United Kingdom*

**Purpose:** The optimal strategy to minimise neurological morbidity and mortality following acute type A aortic dissection repair is unclear and remains controversial. There are a number of strategies employed, which include deep hypothermic circulatory arrest (DHCA), retrograde cerebral perfusion (RCP) and antegrade cerebral perfusion (ACP). This study was designed to examine the outcomes of a variety of cerebral protection strategies used in our institution for acute type A dissection repair.

**Methodology:** A retrospective review of our institution's aortic surgery database was undertaken to compare outcomes of various cerebral protection strategies in acute type A dissection repairs. These included DHCA only, hypothermic circulatory arrest with ACP and hypothermic circulatory arrest with RCP. Data for this database was prospectively entered.

**Results:** Pre-operative characteristics between groups were similar. A variety of repair techniques were employed in the dissection repairs, including root replacement, ascending aorta, hemiarch and total arch replacement. Preliminary data analysis demonstrated that there were no significant differences between groups with regard to in-hospital mortality, stroke or re-operation for bleeding. Preliminary 3-year survival plots demonstrated no significant differences between groups.

**Conclusion:** Preliminary analysis of the outcomes in type A dissection repairs in our institution have shown that the different cerebral protection strategies do not have a significant impact on outcomes. However, these results need to be considered in the context of the limitations of a retrospective analysis. Further analyses of this data will be undertaken.

## PROPENSITY MATCHED COMPARISON OF SURGICAL AORTIC VALVE REPLACEMENT WITH TRANSCATHETER AORTIC VALVE IMPLANTATION: A SINGLE CENTRE EXPERIENCE

Dr Alfred **Hing**, Mr Matthew Shaw, Prof Aung Oo

*Liverpool Heart and Chest Hospital, Merseyside, United Kingdom*

**Purpose:** Transcatheter aortic valve implantation (TAVI) for aortic stenosis has been increasing, as demonstrated in the UK TAVI Registry Report. As TAVI patients are normally high-risk elderly patients, we undertook a propensity-matched study to compare outcomes of surgical aortic valve replacement (sAVR) with TAVI in order to exclude the confounding differences between patient groups that normally have surgery versus those with transcatheter procedures.

**Methodology:** A retrospective review of our institution's aortic surgery database with propensity score matching was undertaken to compare outcomes of sAVR versus TAVI. Data for this database is prospectively entered.

**Results:** There were 2,102 sAVR and 260 TAVI performed between 2008-2016 with significant differences in most of their pre-operative characteristics such as Euroscore (6.0 vs 17.3) and age (72 vs 84 years). After propensity score matching, there were 179 patients in each group with no significant differences in their pre-operative characteristics. There were no significant differences between groups with respect to in-hospital mortality (4.5% in each group), stroke (1.7% sAVR vs 2.2% TAVI), post-operative myocardial infarction (0.1% vs 0%) or pacemaker implantation (3.4% vs 3.9%). Hospital (11 vs 7 days) and critical care (3 vs 2 days) length of stay were higher in the sAVR group. There was a significant difference between groups in actuarial survival rates at 1-year (89.6% (sAVR) and 85.0% (TAVI)) and 5-years (62.7% and 43.2%).

**Conclusion:** In our institution, in-hospital short-term outcomes are comparable between sAVR and TAVI. However, long-term survival is more favourable in those having a surgical approach to valve replacement than transcatheter routes.

## A "HYBRID" HYBRID APPROACH – AORTIC DEBRANCHING USING A TRIFURCATE GRAFT FOR ARCH AND DESCENDING THORACIC AORTIC ANEURYSM REPAIR WITH THE THORAFLEX™ HYBRID GRAFT

Dr Charles **Jenkinson**, Mr Robert Larbalestier

*Fiona Stanley Hospital, WA*

**Purpose:** Pathology of the aortic arch and descending thoracic aorta poses many unique challenges for the cardiovascular surgeon. The Thoraflex™ hybrid device for the "frozen elephant trunk" procedure simplifies management of the descending thoracic aorta, whilst allowing anastomosis of the head and neck vessels to the proximal graft. We report our modification to the technique, involving the use of the Trifurcate Graft with Side Branch (Vascutek-Terumo Ltd, Ann Arbor, MI, USA) to improve the ease of arch vessel control and ensure continuous selective anterior cerebral perfusion.

**Methodology:** Via median sternotomy and central cannulation, the patient is placed on cardiopulmonary bypass and cooled to 20°C. The arch and neck vessels are identified. After cross-clamping and administration of cardioplegia, the brachiocephalic and left common carotid artery are anastomosed to the trifurcate graft between clamps, and perfusion to the head is maintained via the side branch. Following this, the arch is excised under a short period of

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circulatory arrest, and the Thoraflex™ hybrid graft is deployed into the descending aorta, and an anastomosis made to the sewing cuff. The proximal anastomosis is then made to the ascending aorta after re-establishment of systemic perfusion. The left subclavian artery is then anastomosed to the trifurcate graft, and the trifurcate graft is anastomosed to residual ascending aorta in an end-to-side fashion.

**Results:** We have two cases that have been solved using this approach. We present surgical pictures, and intraoperative imaging.

### HEART AND LUNG TRANSPLANTATION AT FIONA STANLEY HOSPITAL – A NEW CENTRE'S EXPERIENCE

Dr Charles **Jenkinson**, Dr Dorian Wenzel, Mr Stuart Prince, Mr Christopher Merry, Mr Karim Slimani, Mr Robert Larbalestier

*Fiona Stanley Hospital, WA*

**Purpose:** When Fiona Stanley Hospital commissioned in February 2015, the Heart and Lung Transplantation unit from Royal Perth Hospital was moved to this new facility. In the intervening 18 months, we have undertaken forty-four heart or lung transplants, making this period the busiest in Western Australian history. This higher-than-previous volume falls on the background of the challenges associated with opening a new unit in a new hospital. The first elective cardiac case was undertaken on 4 February 2016, and our first transplant occurred less than one month later, on 2 March.

**Methodology:** A retrospective audit of prospectively collected data on the first 44 heart and lung transplants undertaken at Fiona Stanley Hospital since opening in February 2016.

**Results:** 44 heart or lung transplants were performed during this period, further divided into 16 orthotopic cardiac transplants, and 28 bilateral sequential lung transplants. The average age of patient receiving BSLT was 50.3 years. 18 of 28 (64.3%) of lung transplants were performed without the aid of cardiopulmonary bypass. 9 patients (32.1%) were transplanted for COPD, whilst 6 (21.4%) were transplanted for cystic fibrosis. Of the heart transplants, the average age was 46, and 11 (68.8%) were undertaken for idiopathic cardiomyopathy. There was one transplant performed for cardiac tumour, one for ischaemic cardiomyopathy, and one for complex congenital pathology.

**Conclusion:** We present our early results for a new centre undertaking heart and lung transplantation in Western Australia, including our complications and short-term follow-up.

### SHORT AND LONGTERM INDIGENOUS AUSTRALIAN CARDIAC SURGERY OUTCOMES

Dr Scott **Jennings**, Dr Greg Rice, Dr David Lance, Dr Hugh Cullen, A/Prof Robert Baker, A/Prof Jayme Bennetts

*Flinders Medical Centre, Adelaide, SA*

**Purpose:** Indigenous Australians are over-represented in cardiac disease despite health policy advancements. Indigenous Australians present for cardiac surgery at significantly younger age and with a greater burden of co-morbidities than non-indigenous people. As a result, current risk stratification models under-estimate Indigenous patient risk. The primary aim of this study is to determine the predicted mortality risk conveyed by an ethnic weighting, Indigenous status, at 30-days post-operatively when used in combination with the AusSCORE model of peri-operative risk (PROM). The secondary aim is to determine the longterm survival of Indigenous Australians after cardiac surgery.

**Methodology:** A retrospective case audit was performed identifying 4388 cases from 1/1/2005 to 31/12/2015. 30-day mortality risk was calculated using AusSCORE variables with the re-construction of a multivariate model using logisitic regression and incorporating the risk that Indigenous status conveys. Kaplan-Meier survival analysis was used to determine long-term outcomes. Mortality outcome data was collected by 30-day and 6-month follow-up phone call, Flinders Medical Centre Patient Administration System, National Death Index and Northern Territory Clinic Database. All statistical analysis was performed using SPSS Ver. 23. Significance was set at $p = 0.05$.

**Results:** 662 patients were Indigenous. Indigenous status showed increased risk of 30-day mortality when calculated in combination with the AusSCORE PROM variables. The increase was not significant, but trended towards higher mortality at 30-days (OR 2.26, $p = 0.061$, AUC = 0.77) when compared to non-indigenous patients. Kaplan-Meier analysis up to 2000 days demonstrated significant disparity in early and late survival in those Indigenous patients aged <55yrs (Log Rank <0.001 and Breslow <0.001). Indigenous patients ≥55 years showed no significant difference in early or late survival (Log Rank = 0.693 and Breslow = 0.642).

**Conclusion:** This is the largest single centre review of Indigenous cardiac surgery outcomes to date. It has demonstrated that Indigenous patients have a 2.26x, but statistically non-significant higher chance of mortality than non-indigenous patients at 30-days when Indigenous status is used in combination with the AusSCORE model for PROM. <55yrs Indigenous Australians also have reduced long-term survival being most apparent after 1500-days. This is not seen in the ≥55yrs cohort.

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## 11 YEARS OF RESUSCITATIVE THORACOTOMIES FOR BLUNT AND PENETRATING TRAUMA AT A LEVEL 1 TRAUMA CENTRE

Dr Shivangi **Jog**, Mr Peter Bautz, Dr Leong Tiong, Dr Christopher Dobbins, Dr Cea Cea Moller, Dr Dinesh Trehan, Mr Chris Clarke

*Royal Adelaide Hospital, Adelaide, SA*

**Introduction:** Resuscitative thoracotomies are a last ditch effort in salvaging dying trauma patients. RAH has a protocol for emergency resuscitative thoracotomies (ERT), with thoracotomy initiated when the systolic BP<60mmHg with maximal resuscitation.

**Materials and Methods:** Moribund trauma patients who presented to the RAH from 2005-2015 were included. The indications were identical for blunt and penetrating trauma. ERT technique is now a clamshell thoracotomy yielding excellent exposure. Trauma surgeons were usually present on patient arrival, or within 7 minutes.

**Results:** 90 patients underwent an ERT. 65.4% of penetrating ERT's survived but only 22% of blunt ERT's survived. 84.23% of emergency room thoracotomies were successful and patients left the ED with a spontaneous circulation. Blunt ERT performed within 10 minutes of arrival had 4.55% survival while penetrating ERT within first 10 minutes had a 33.33% survival. If the first 10 minutes of blunt ERT's were excluded, blunt ERT survival was 32.4%. Patients who were very unstable left theatre with damage control thoracostomies, frequently associated with laparostomies as combined thoraco-laparostomies. One patient developed a CVA. There was a zero survival rate in patients with >1 prehospital cardiac arrest with CPR on arrival. Blunt cardiac ruptures had 11.1% survival, whilst penetrating cardiac injuries had 69.2% survival.

**Conclusion:** The presence of trauma surgeons in ED using an established protocol allows ERT survival of 65.4% in penetrating trauma and up to 32.4% in blunt trauma.

## DIRECT INNOMINATE ARTERY CANNULATION AS SOLE VISCERAL AND CEREBRAL PERFUSION TECHNIQUE IN THORACIC AORTIC SURGERY

Dr Alireza **Kashani**, Dr Mathew Doyle, Dr Matthew Horton

*St. George Hospital, Sydney, NSW*

**Purpose:** Innominate artery (IA) is one of the proposed arterial cannulation sites for thoracic aortic surgery. However, majority of the published data utilize a side graft. We present our experience with direct innominate cannulation and redirection of the cannula towards the cerebral vessels during deep hypothermic circulatory arrest (DHCA).

**Methodology:** A retrospective case series was conducted on 14 patients who have undergone direct IA cannulation for thoracic aortic operations since 2009.

**Results:** 1 patient suffered cerebrovascular accident (CVA), which was on the background of acute aortic dissection. 1 patient suffered from prolonged delirium, which was on the background of previous CVAs. ICU length of stay was 4.62±3.77 (2-13) days and total hospital length of stay was 13.07 ±6.61 (5-26) days. There was no mortality in this patient group.

**Conclusion:** Direct Innominate Artery Cannulation with redirection of the flow towards cerebral vessels during DHCA not only can be performed safely with no added risk to the patients, but also reduces the operating time and avoids extra incisions (axillary, femoral, etc.), and potentially reduces the inherent risk of complications caused by other techniques.

## EARLY AND LATE OUTCOMES IN MINIMALLY INVASIVE MITRAL SURGERY – 200 CASES

Yujiro **Kawanishi**, Paul Jansz

*St Vincent's Hospital, Sydney, NSW*

**Background:** This study assessed the clinical and echocardiographic outcomes for patients who underwent minimally invasive mitral valve surgery (MIMVS) at St Vincent's Public and Private Hospitals, Sydney.

**Methods:** The database at St Vincent's Hospital was reviewed. From August 2007 to Dec 2015, 200 patients underwent MIMVS via a right mini-thoracotomy and femoral cannulation under a single surgeon. The perioperative data and follow-up data were retrospectively collected and analysed. Robotic surgeries were excluded.

**Results:** The mean age was 56 ± 15 years, 82 were female. 153 patients received mitral valve repair and 47 underwent replacement. The predominant pathology was myxomatous degenerative for the repair and rheumatic for the replacement. No patient was converted to sternotomy and only one had failed repair (repair rate was 99.4%). The mean aortic cross-clamp time and CPB time was 74±20 min and 101±28 min. There was no hospital mortality. Postoperative complications included atrial fibrillation in 59, stroke in 3, TIA in 2, renal failure in 3, re-exploration for bleeding in 6. Median intubation time, ICU stay, hospital stay, drain bleeding was 7 hours, 2 days, 6 days, and 500ml, respectively. There were 2 late deaths and 3 reoperations (1 after repair and 2 after replacement) at 26 months of mean follow-up. Overall survival was 99±1% and 92±1% at 1 and 5 years. Freedom from mitral regurgitation (≥ moderate) was 100% and 95±1% at 1 and 5 years, and freedom from reoperation was 100% and 93±1% at 1 and 5 years.

**Conclusions:** MIMVS through right thoracotomy can be safely and effectively performed, with low perioperative morbidity and mortality, high repair rate, and low rates of reoperation and death.

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## PROPENSITY SCORE ANALYSIS SUPPORTS THE BENEFIT OF THE HEART TEAM MEETING ON MORTALITY IN HIGH-RISK CARDIAC SURGERY

Mr Shanq Kuen **Koo**, Conjoint Associate Professor Rebecca Dignan, Mr Corey Williams, Dr Christian Mussap

*The University of New South Wales, Liverpool Hospital, Liverpool, NSW*

**Introduction:** The Heart Team (HT) is a multidisciplinary team that advises on optimisation and management of complex patients. There is limited evidence about the effects of the HT on high-risk cardiac surgery patients.

**Methods:** The study population included cardiac patients operated at Liverpool Hospital or referred to the HT between 2013 and 2014. Patients' mortality risks were estimated using existing risk scoring models (RSM). High-risk patients were identified using the high-risk cut-off point derived from the RSM analysis in a separate study. Propensity score matching was performed for the high-risk cohorts and the effect of the HT for the matched populations was examined. Compliance to the HT recommendations was reported.

**Results:** Compliance to recommendations was 78.5%. Overall, 898 surgical patients were used for the HT analysis. Two high-risk cohorts were formed using high-risk cut-off points for EuroSCORE II (ES2≥3, n=249) and Society of Thoracic Surgeon score (STS≥1.705, n=241). Forty-three and 35 matched pairs between the HT and the non-HT cohort were obtained for the ES2 and STS high-risk cohort respectively. A trend to decrease mortality was observed between matched HT and non-HT high-risk ES2 cohort (16.0% vs 23.0%; p=0.510) and number needed to discuss was 14.3 to save one mortality.

**Conclusion:** Analysis of propensity score matched cohorts showed an acceptable number needed to treat and evidence supported the HT benefit. The HT should be used when managing complex cardiac surgery patients in order to provide an equipoised evidenced-based clinical decision tailored to the needs of the patient.

## MORTALITY AND THROMBOEMBOLIC EVENTS IN HYPERCOAGULABLE STATES FROM ROTEM-THROMBOELASTOMETRY IN PATIENTS WHO UNDERGO CORONARY BYPASS SURGERY

Mr. Sira **Laohathai**, Prof Montien Ngodngamthaweesuk, Prof Pichika Chantrathammachart, Prof Parinya Leelayana, Prof Piya Cherntanomwong, Prof Siam Khajarern

*Ramathibodi Hospital, Bangkok, Thailand*

**Objective:** To test the hypothesis that Post CABG thromboembolic events and MACCE at 1, 3, 6,and 12 months after surgery are related to the pre-surgical TEG status and investigate the prevalence of pre-operative hypercoagulability in the high risk population in Thailand assessed by Rotational Thromboelastography (ROTEM).

**Method:** This is a prospective cohort study consecutively assessing pump CABG surgery patients. Hypercoagulability was defined as any clotting time (CT) clot formation time (CFT), amplitude 10 min after CT (A10), or maximum clot firmness (MCF) in ROTEM measurement above the upper normal limit of EXTEM, INTEM and FIBTEM in the worldwide population.

**Results:** Forty percent of patients show a state of hypercoagulability in terms of ROTEM. The majority of hypercoagulable patients were female. ROTEM data illustrate the significant upward trends of A10, A20 and MCF above the upper limit in hypercoagulable patients with levels of 90%, 68% and 95 % in EXTEM, INTEM AND FIBTEM, respectively. The mortality and MACCE event rates were slightly increased in hypercoagulable patients both at 30 days and at 1 year with statistical significance in all event rates at the 1-year follow up. In univariate terms, ROTEM hypercoagulability is also associated with uneventful combinations in the follow up at 1 year.

**Conclusion:** Hypercoagulability was found in 43% of on pump CABG patients and is associated with high risk for mortality and morbidity in the 1-year follow up.

## PROPHYLACTIC INTRA-AORTIC BALLOON COUNTERPULSATION IN HIGH RISK CARDIAC SURGERY: THE PINBALL PROGRAMME OF RESEARCH AND LINKED-DATA PILOT RCT

Dr Edward **Litton**, Prof Chris Reid, Prof Julian Smith, Ms Liz Yarad, Ms Frances Bass, Dr Anthony Delaney, Prof Graham Hillis, Dr Theresa Jacques, Ms Nicole Marrow, Prof David Mcgiffin, Dr Shay Mcguinness, Dr Hugh Playford

*Fiona Stanley Hospital, WA*

**Purpose:** Prophylactic intra-aortic balloon pump (IABP) therapy in high risk patients undergoing CABG surgery may reduce mortality. However, the quality of the available evidence is low and there is substantial variability in use. Although there is a need to generate high quality evidence, several issues first need to be addressed, including equipoise for enrolment into a RCT, delivery of prophylactic IABP in a trial setting and study recruitment rate. The aim of the PINBALL pilot RCT is to address these issues and assess the feasibility of a definitive trial.

**Methodology:** PINBALL is a multidisciplinary collaboration involving the ANZSCTS Database Program. The current pilot study builds on a programme of registry-linked research, nesting an RCT within a high quality database. Patients are screened for eligibility i.e. they have no exclusion criteria and are listed for CABG surgery, the treating surgical team is uncertain as to the benefit of prophylactic IABP and there is one or more of: severely impaired left ventricular function, recent or ongoing myocardial ischaemia, or critical coronary artery stenosis.

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**Results:** The pilot RCT has screened 100 and enrolled 17 participants at five centres (planned sample size is 40), randomising patients to either prophylactic IABP in addition to standard care, or standard care alone. Recruitment rate is currently 0.5 (range 0.1-0.7) participants per site per month. Treatment according to enrolment status occurred in 7/8 (88%) and 9/9 (100%) of participants in the IABP and no IABP arms respectively.

**Conclusion:** Randomization to an IABP trial appears feasible, however current recruitment rate is low, suggesting a definitive trial would require a substantial number of sites and time.

### SURGICAL AORTIC VALVE REPLACEMENT VERSUS TRANS-FEMORAL AORTIC VALVE IMPLANTATION USING THE LOTUS BIO-PROSTHESIS: EARLY AND MID-TERM OUTCOMES

Dr Eric Yu Wei **Lo**, Dr James Farag, Dr William Shi, Dr Hashrul Rashid, Dr Rob Gooley, Dr Prashant Joshi, Dr Liam Mccormick, Prof Ian T. Meredith, Prof Julian A. Smith

*Monash Health, Melbourne, VIC*

**Introduction:** Trans-catheter aortic valve implantation (TAVI) has emerged as a viable alternative to surgery for higher-risk patient subgroups. There are few reports from Australasia directly comparing early and mid-term outcomes between conventional surgical aortic valve replacement (AVR) and TAVI, especially with respect to the Lotus valve. We sought to do so by review of our centre's experience.

**Methods:** From 2012-2016, 125 patients underwent TAVI using the Lotus prosthesis at a single centre after assessment by a multidisciplinary heart valve team. These patients were compared to a historical control cohort of 184 patients undergoing isolated surgical AVR between 2000-2010 prior to the introduction of our TAVI program. Peri-operative characteristics were compared between groups as was mid-term survival and freedom from aortic regurgitation. Propensity-score matching was used for risk adjustment.

**Results:** Patients undergoing TAVI were older (mean age, TAVI: 84±6 vs. AVR: 66±14, $p<0.001$), and more likely to be female (55% vs. 37%, p=0.002) and have chronic respiratory disease (23% vs. 145, p=0.049). Unadjusted in-hospital mortality was similar (TAVI: 2% vs. AVR: 5%, p=0.25) as were rates of stroke (5% vs. 2%, p=0.17). However, TAVI patients were more likely to experience post-procedure heart block requiring permanent pacemaker insertion (22% vs. 3%, $p<0.001$). Propensity-score matching yielded 40 matched pairs. Amongst pairs, in-hospital mortality was similar (3% vs. 10%, p=0.36) as was stroke (5% vs. 5%, $p > 0.99$). There was a trend towards higher pacemaker rates in TAVI patients (15% vs. 3%, p=0.06). Amongst matched pairs, survival at 3 years was similar (TAVI: 81% (71-97%) vs. AVR: 84% (71-97%), $p>0.99$). At 3 years, freedom from ≥ mild aortic regurgitation was comparable (77% (56-98%) vs. (70% (54-86%), p=0.48). None of the TAVI patients required a repeat aortic valve procedure while 2 AVR patients required re-do AVR.

**Conclusion:** TAVI performed using the Lotus prosthesis achieves similar early and mid-term outcomes compared to surgical AVR, despite higher early rates of pacemaker insertion. Both TAVI and surgical AVR can produce strong clinical results when applied judiciously by a multidisciplinary heart team. Longer follow-up and analysis of functional status in older, frail patients may further elucidate the benefits of each modality.

### BIOMECHANICS AND MYOCARDIAL DAMAGE IN CHRONIC MITRAL REGURGITATION

Mr David **McGiffin**

*The Alfred Hospital, Melbourne, VIC*

The 2014 ACC/AHA guidelines for surgery for asymptomatic chronic mitral regurgitation states as a class IIa recommendation that mitral valve (MV) repair could be considered if the left ventricular ejection fraction (LVEF) is greater than 0.60 and the LVESD less than 40 mm if there is a 95% probability of a durable repair with an expected mortality of less than 1%. However adhering to these guideline surgical triggers uncovers a subset of patients (20% incidence) where the LVEF decreases post repair. Is this due to changing loading conditions or impaired myocyte contractility? In a study at University of Alabama at Birmingham of patients undergoing (MV) repair for chronic mitral regurgitation MRI derived left ventricular (LV) volumes demonstrated reverse diastolic remodelling while left ventricular end systolic remodelling was essentially unchanged following surgery. Myocardial strain rates were normal prior to mitral valve repair. However in the face of unchanging left ventricular end systolic wall stress, strain rates decreased below normal following MV repair suggesting a decrease in left ventricular contractile performance. LV biopsies of these patients taken at the time of MV repair demonstrated deposition of lipofuscin which is composed of protein and lipid degradation residues. Lipofuscin accumulation may have a deleterious effect on myocyte function. These biopsies also demonstrated extensive myofibrillar degeneration. The desmin cytoskeleton in the myocardium forms a continuous network maintaining a spatial relationship between the contractile apparatus and mitochondria. The LV biopsies demonstrated desmin loss indicating substantial underlying cellular and molecular damage. Implications: At the time of correction of mitral regurgitation substantial LV damage has occurred. This suggests that an even earlier repair of mitral regurgitation should be considered.

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### ANZSCTS DATABASE PROGRAM – MONITORING CARDIAC SURGICAL PERFORMANCE FOR IMPROVED PATIENT OUTCOMES

Dr Nupur **Nag**, Dr Lavinia Tran, Professor Christopher Reid, Mr Gilbert Shardey, Mr Noah Solman, Mrs Nicole Marrow

*Monash University, Melbourne, VIC*

**Purpose:** The Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) Database Program is an established quality assurance program aimed to monitor and improve cardiac surgical performance. The program collects routine systematic data related to all cardiac surgical procedures and monitors that data as a means to review surgical unit outcomes.

**Methodology:** Participating hospitals are responsible for accurate data collection of defined fields via a web portal or via imported data. Data and project management, including collection, analysis, and reporting is conducted at the Centre for Cardiovascular Research and Education in Therapeutics (CCRET), Monash University.

**Results:** Currently 23/24 public and 8/33 private hospitals participate in the program. Over 100,000 procedures have been collected of which 55% are isolated CABG. Thirty day mortality rate for isolated CABG, isolated AVR and other cardiac procedures is 1.6%, 2.8% and 6.1% respectively. Twenty sites use the web portal, currently being updated to refine data definitions for improved data quality. Surgeons may access their own data, while data requests for research require ANZSCTS Database Steering Committee approval, and are provided in de-identified form. Quarterly reports on endorsed Quality Indicators, benchmarked against de-identified participating units, are provided to participating hospitals. An annual report, with in depth statistical analyses, is distributed to stakeholders with aim to feedback performance and assure quality of patient care.

**Conclusions:** The ANZSCTS Database Program provides a platform to benchmark hospital performance with the goal of standardising care and improving patient outcomes across Australia and New Zealand.

### LONG-TERM OUTCOMES FOLLOWING REPAIR OF TRUNCUS ARTERIOSUS AND INTERRUPTED AORTIC ARCH

Dr Phillip **Naimo**, Dr Tyson Fricke, Dr Melissa Lee, Prof Yves D'Udekem, A/Prof Christian Brizard, Prof Igor Konstantinov

*Royal Children's Hospital, Melbourne, VIC*

**Purpose:** To evaluate the long-term outcomes following repair of truncus arteriosus and concomitant interrupted aortic arch.

**Methods:** Between 1979 and 2016, 180 patients underwent repair of a truncus arteriosus. Twenty-two patients were identified with concomitant interrupted aortic arch, and were retrospectively reviewed.

**Results:** Median age at repair was 45 days (mean 29 days, range 2 days to 164 days). Median weight at repair was 3.4 kg (mean 2.9 kg, range 1.2 kg to 3.6 kg). Interrupted aortic arch was type A in 4 patients, type B in 17 patients, and type C in 1 patient. Twenty-one patients underwent concomitant truncus arteriosus and interrupted aortic arch repair. Interrupted aortic arch repair was performed by end-to-side anastomosis in 19 patients, and by patch augmentation in 3 patients. Early mortality was 14% (3/22). There were no late deaths. Overall survival was 86.4 ± 7.3% (95% CI: 63.4, 95.4) at 30 years. Concomitant interrupted aortic arch was not associated with mortality. Six patients underwent 10 aortic reoperations. Freedom from aortic arch reoperation was 67.1 ± 11.2% (95% CI: 40.3, 83.9) at 30 years. One patient underwent balloon dilation of the aortic arch. Freedom from right ventricular outflow tract reoperation was 0% at 15 years. Follow-up was 95% complete (21/22), with median follow-up time of 19.4 years (mean 12.8 years, range 1 to 30 years). At last follow-up, mild residual aortic arch obstruction was identified in 1 patient, and all patients were in New York Heart Association Class I/II.

**Conclusion:** Concomitant repair of truncus arteriosus and interrupted aortic arch is not associated with mortality and can be achieved with good long-term outcomes.

### LIFE AFTER SURVIVING FONTAN SURGERY: A META-ANALYSIS OF THE INCIDENCE AND PREDICTORS OF LATE DEATH

Dr Chin **Poh**, Ms Diana Zannino, Prof Yves D'Udekem

*The Royal Children's Hospital, Melbourne, VIC*

**Purpose:** Up to 40% of patients will develop failure of their circulation by 20 years after Fontan surgery. [1] However we remain unable to identify those at highest risk of late death. We conducted a meta-analysis of reported late outcomes for patients with a Fontan circulation to identify predictors of late death.

**Methodology:** A systematic review was performed of relevant studies from January 1990 to December 2015. A meta-analysis of independent predictors of late death was conducted using the Mantel-Haenszel method to analyse dichotomous outcomes of survival. Summary survival probabilities were pooled from individual Kaplan-Meier curves to generate a distribution-free summary survival curve to derive overall survival probabilities.

**Results:** Thirty-four relevant publications were identified, with 7536 patients included in the analysis. Mean follow-up duration was 114 months (range 24-269 months). There were 688 (11%) late deaths. Predominant causes of death were late Fontan failure (34%), sudden death (19%) and peri-operative death (16%). Estimated mean Kaplan-Meier survival at 5, 10 and 20 years post surgery were 95% (95%CI 93-96), 91% (95%CI 89-93) and 82% (95%CI 77-85). Significant predictors of late death are prolonged pleural effusions post Fontan surgery (HR1.18, 95%CI 1.09-1.29, $p<0.001$), protein losing

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enteropathy (HR2.19, 95%CI 1.69-2.84, p <0.001), increased ventricular end diastolic volume (HR1.03 per 10ml/BSA increase, 95%CI 1.02-1.05, p<0.001) and having a permanent pacemaker (HR12.63, 95%CI 6.17-25.86, p<0.001).

**Conclusion:** Close to 85% of patients who survive Fontan surgery will be alive 20 years later. Late sequelae like protein losing enteropathy, ventricular dysfunction or having a pacemaker predict a higher risk of late death. 1. d'Udekem Y, Iyengar A, Galati J et al. Redefining Expectations of Long-Term Survival After the Fontan Procedure: Twenty-Five Years of Follow-Up From the Entire Population of Australia and New Zealand. Circulation 2014; 130: S32-38.

### SYNCHRONOUS ANAORTIC OFF-PUMP CORONARY ARTERY BYPASS SURGERY AND CAROTID ENDOARTERECTOMY: A CASE SERIES

Dr Fabio **Ramponi**, Dr Michael Seco, Stella Harris, Bronwen Needham, Prof Michael Wilson, Prof Michael Vallely

*Royal Prince Alfred Hospital, Sydney, NSW*

**Purpose:** The management of patients with severe concomitant coronary and carotid artery disease is still a matter of debate; in the absence of randomized controlled trials, timing of the procedures and revascularization strategies are still a decision based on local expertise. In this paper we present our experience with synchronous carotid endoarterctomy (CEA) and anaortic off-pump coronary bypass (OPCAB). Primary end-points are 30-day mortality, stroke and myocardial infarction.

**Methodology:** From 2009 more then 1.000 patients underwent total arterial anaortic-OPCAB in our Institution (30-day stroke rate < 1%). All cases had pre-operative carotid-subclavian duplex ultrasound screening; 31 patients had significant concomitant carotid disease and underwent synchronous CEA and anaortic-OPCAB. Mean age was 70.8 year-old and 12.9% were female. Twenty-one patients (67.7%) underwent an urgent operation and three of them had previous neurological ipsilateral symptoms (1 TIA, 3.2%; 2 strokes, 6.5%). All patients had total arterial revascularization (BIMA 58.1%; mean grafts number 2.9) and a conventional longitudinal carotid endoarterectomy with patch angioplasty.

**Results:** One peri-operative stroke (3.2%) and two deaths within 30 days (6.5%) were observed. No peri-operative MI were recorded; the mean length of stay was 9 days. One patient died on post-operative day 2 of gut ischemia after waking up with ipsilater upper limb weakness due to carotid patch thrombosis. The other death occurred on post-operative day 27 after discharge from hospital. Both were urgent referrals for recent NSTEMI and had EuroScore > 10%.

**Conclusion:** Synchronous anaortic-OPCAB and CEA is a safe and effective option for patients requiring combined revascularization.

### HAEM-ENZYMES PREDICTIVE OF CORONARY ARTERY DISEASE ARE PRESENT IN THORACIC AND ABDOMINAL AORTIC ANEURYSM

Dr Andrew **Sherrah**, Prof Michael Wilson, Dr Shane Thomas, Mr Enoch Chan, Dr Amanda Yeung, Dr Elizabeth Robertson, Prof Richmond Jeremy, A/Prof Brett Hambly, Dr Raffi Qasabian, Prof Michael Vallely, Prof Paul Bannon

*The Baird Institute, Sydney, NSW*

**Purpose:** A reliable plasma biomarker for aortic aneurysm has proven elusive. Elevated plasma levels of the oxidative or immune regulatory haem-enzymes myeloperoxidase (MPO) or indoleamine 2,3-dioxygenase (IDO) can predict disease prevalence and clinical risk in coronary artery disease patients. We therefore studied the relationship of MPO and IDO with thoracic or abdominal aortic aneurysm.

**Methodology:** In patients undergoing elective surgical or endovascular repair of thoracic (n=14) or abdominal (n=18) aortic aneurysm, pre-operative plasma was analysed for MPO protein levels by ELISA or IDO activity (indexed as a ratio of IDO's product kynurenine and substrate tryptophan) and compared with healthy controls (n=15). Plasma levels of other inflammatory markers (CRP, neutrophil elastase) were also measured. Surgically resected aortic wall samples were analysed for MPO protein by immunohistochemistry.

**Results:** Patients with abdominal aneurysms [72 yrs (67-76)] were significantly older than those with thoracic aneurysms [57 yrs (52-70)] and healthy controls [31 years (29-36)] and more likely to have atherosclerosis as the aetiology of aortic disease (88.9% vs. 28.6% in thoracic aneurysm). Plasma IDO activity and CRP levels, but not MPO or elastase, were significantly elevated in patients with aortic aneurysm vs. healthy controls. MPO protein, however, was expressed in the intima and media of all aortic aneurysm specimens but not non-diseased aorta.

**Conclusion:** The haem-enzymes MPO and IDO may be involved in human aortic aneurysm and their roles warrant further study in experimental animal models of aneurysm. Measurement of plasma IDO activity and CRP, but not MPO, may represent potential useful biomarkers for aortic aneurysm.

### HOW THEY FARE: OCTOGENARIANS UNDERGOING AORTIC VALVE REPLACEMENT

Dr Elizabeth **Suthers**, Dr Nikki Stamp, Mr Christopher Merry, Mr Robert Larbalestier

*Fiona Stanley Hospital, WA*

**Objective:** High risk patients are doing better after cardiac surgery with advances in peri-operative management. Transcatheter aortic valve implantation has been introduced as an alternative for high risk surgical patients, which stimulates an increasing interest in the outcomes of





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octogenarians undergoing surgical AVR. We have reviewed major outcomes for this cohort in our units, to better understand the current risk benefit profile.

**Methods:** A retrospective analysis was performed, of 82 patients aged 80-89 years, undergoing AVR, between 2010 and 2016, in three Western Australian hospitals. Outcomes were 30day mortality, stroke, new renal failure, further intervention and duration in ICU and hospital length of stay.

**Results:** The mean age was 83 years old with 65% male preponderance. There was preexisting CCF in 12% and 15% for CVA/TIA. All patients came from independent living. Two had a re-do sternotomy. Forty-eight percent underwent AVR alone while 43% required concomitant CABG. The mean size implanted was 23mm with 109min bypass and 84 min cross-clamped. An IABP was required to wean one patient from bypass. The mean ICU stay was 3.4 days and mean total hospital stay was 11.9 days. 6% of patients had a new cerebrovascular accident and 44% developed an arrhythmia. 30% of patients developed AKI (as per ANZSCTS definition). 4 patients required pacemakers. Overall 30 day mortality was 2.5%.

**Conclusion:** Surgical AVR in octogenarians has reproducible, acceptable outcomes and complication rates.

### EFFECTS OF PREOPERATIVE RENAL FUNCTION ON OUTCOMES FOLLOWING CARDIAC SURGERY: A COMPARATIVE STUDY OF 1875 PATIENTS

Dr Sameer **Thakur**, Dr Mohammad Azari, Mrs Carmel Fenton, Mr Nick Carr, Dr Rajiv Sharma, Mr Mark Murton, Mr Keshav Bhattarai, Mr Ashutosh Hardikar

*Cardiothoracic Surgical Unit, Royal Hobart Hosptal, Hobart, TAS*

**Purpose:** To evaluate the effects of renal dysfunction (RD) on outcomes following cardiac surgery in a large series of patients.

**Methodology:** A comparative study was performed on all patients having undergone cardiac surgery between April 2008 and January 2016 at our institute (n=1875, mean age 67±11 years, 75% males). Data for all patients were collected prospectively as part of a national database. Patient demographics and perioperative data were collected. Preoperative renal function was classified as normal renal function (NRF, CrCl>85ml/min, 45%), moderate RD (CrCl 50-85ml/min, 42%), severe RD (CrCl<50ml/min, 12%), or patients on renal replacement therapy (RRT; 1.4%).

**Results:** Most commonly performed operations were isolated CABG (52%) and isolated AVR (13%). ICU stay was longer in those with moderate RD (45±78h; P=0.049) or severe RD (63±112h; P=0.002) or those on RRT (87±78h; P=0.004) when compared with those with NRF (39±52h), as was return to ICU rate (4.5% in severe RD vs 1.4% in NRF, P=0.044), and prolonged (>4h) inotropic requirements (37% in RRT vs 13% in NRF, P<0.001). There was no significant difference amongst groups in postoperative stroke rate. Blood transfusion rate was significantly higher in those with more severe RD (normal, 13%; moderate RD, 24%; severe RD, 40%; RRT, 70%). Return to theatre ranged from 15% in RRT to 4% in NRF (P=0.002). New postoperative RRT was required in 3.6% of those with severe RD, 0.5% of those with moderate RD, and 0.1% of patients with NRF (P<0.001). Early mortality was significantly higher in those with more severe RD (normal, 0.4%; moderate RD, 1.5%; severe RD, 2.3%; RRT, 3.7%; P=0.023).

**Conclusion:** Preoperative RD is associated with worse outcomes following cardiac surgery.

### AORTIC VALVE REPLACEMENT – RIGHT ANTERIOR THORACOTOMY

Dr Hugh **Wolfenden**

Aortic Valve Replacement (AVR) has been performed since 1960 via the classic and gold standard approach of mediansternotomy, with excellent results achieved in an increasingly aging population. Whilst minimal access procedures have been performed since the late 1990s via the superior hemi-sternotomy, this approach did not take off due the limitations of a sternal fracture. Mini thoracotomy approaches have been performed for many years but required peripheral cannulation and were technically difficult in valve suture tying. Recent technical advances with Cor-Knot and Rapid Deployment Valves have made valve placement much easier. This allows for a conventional AVR to be performed through a less invasive incision whilst maintaining central aortic cannulation. The technique via the right 2nd intercostal space has a short learning curve, is suitable for most patients and keeps surgeon within their comfort zone. Early experience has been good with notable early return of mobility, and well received by cardiologists. Experience with initial 55 cases will be presented.

### LEARNING CORONARY ANASTOMOSIS – QUANTIFYING THE PROCESS

Dr James **Wood**, Dr Fraser Callaghan, Prof Michael Wilson, Prof Stuart Grieve

*Macquarie University, Sydney, NSW*

**Purpose:** To use computational fluid dynamics (CFD) to quantify flow through coronary anastomoses carried out by trainee surgeons.

**Methodology:** All 24 (2015) RACS Cardiothoracic SET trainees carried out two simulated coronary anastomoses. 2mm diameter silicone vessels were anastomosed end to side using 7-0 prolene. Each anastomosis was CT scanned. A centerline was constructed for each of the native and graft

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vessels using a semi-automatic technique. A fully automatic algorithm then segmented the lumen space, generated a CFD mesh and performed CFD simulations assuming flow rates of 30 and 5 mL/min in the graft and native vessels respectively.

**Results:** Velocity, pressure drop and radius were calculated for each anastomosis. Despite externally similar appearances of the completed anastomoses, lumen constriction, and consequently hemodynamics, varied widely in the group according to SET trainee level: mean (±SD) minimum lumen radius, peak velocity and pressure drop respectively for SET Level: SET2 0.47±0.04 mm, 83.8±17cm/s, 1.001±0.36 mmHg; SET4: 0.51± 0.10mm, 75.1±33cm/s, 0.89±0.44mmHg; SET6: 0.44± 0.03mm, 80±21 cm/s, 0.95±0.36mmHg.

**Conclusion:** Using CFD we have been able to characterize hemodynamic performance of coronary anastomoses carried out in a training simulation. We believe this will be an important tool to direct training and optimizing patient outcomes.

### RELATIONSHIP BETWEEN URINARY OXYGEN TENSION DURING CARDIOPULMONARY BYPASS AND DEVELOPMENT OF ACUTE KIDNEY INJURY

Mr Michael **Zhu**, Associate Professor Andrew Cochrane, Professor Julian Smith, Mr Gerard Harrop, Associate Professor Roger Evans

*Department of Surgery, Monash University and Department of Cardiothoracic Surgery, Monash Health, Melbourne, VIC*

**Purpose:** Renal medullary hypoxia may be a common pathway in the development of acute kidney injury (AKI). There are no validated methods to detect medullary hypoxia in patients. However, experimental findings indicate that changes in urinary oxygen tension (UPO2) reflect changes in medullary PO2. Therefore, we evaluated the relationship between intra-operative UPO2 and the development of AKI after cardiopulmonary bypass (CPB).

**Methods:** From January 2015 to July 2016, thirty-five adult patients undergoing on-pump cardiac surgery were prospectively enrolled. UPO2 was continuously recorded intra-operatively via a fibre-optic probe in the tip of the urinary catheter.

**Results:** UPO2 fell during surgery, particularly during CPB. The lowest (nadir) UPO2 was most frequently observed during the rewarming phase, or shortly after weaning from CPB (n=25, 71%). Twelve patients (34%) developed AKI as defined by the AKIN criteria (serum creatinine increase > 26.5 µmol/L or > 50% from baseline within 48 hours). Nadir intra-operative UPO2 was lower in patients who later developed AKI (8.1 ± 6.3 mmHg, mean ± SD) than those who did not (19.6 ± 18.9 mmHg; p=0.013). UPO2 also tended to be lower, in patients who later developed AKI than those who did not, during the rewarming phase of CPB (19.0 ± 9.4 vs 29.6 ± 23.1 mmHg; p=0.06) and after weaning from CPB (18.4 ± 10.9 vs 29.2 ± 20.7 mmHg; p=0.06).

**Conclusion:** Low absolute UPO2 value may be associated with the development of AKI after CPB. Continuous intra-operative monitoring of UPO2 is simple and relatively non-invasive. It may provide a real-time biomarker of risk of AKI. Early detection of risk of AKI may in-turn provide a window of opportunity to intervene and thus avoid development of AKI.

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# POSTER ABSTRACTS

# POSTER ABSTRACTS

*Alphabetical order by presenting author's surname.*

## ROUTINE ULTRASOUND VEIN MAPPING PERFORMED BY THE SURGICAL TEAM REDUCES LONG SAPHENOUS VEIN HARVEST TIME AND COMPLICATIONS

Dr Victor **Aguirre**, Mr Robert Stuklis, MrHugh Cullen, Mr Michael Worthington

*Royal Adelaide Hospital, Adelaide, SA*

**Introduction:** Despite well established recommendations for arterial grafting in coronary bypass revascularisation, the long saphenous vein (LSV) is still utilised. Pre-operative ultrasound (U/S) saphenous vein assessment is not ordinarily used except for patients with varicosities, previous surgery or poor quality vein conduit on clinical examination. The aim of this study is to assess the ability of routine pre-operative U/S assessment of the LSV by the surgical team and its impact on surgical time and recovery.

**Methods:** Patients undergoing coronary artery revascularisation were recruited for this prospective observational study. Demographics including known risk factors for wound complications as well as surgical details were collected. U/S assessment were performed by the surgical registrar before the start of the case identifying the best quality conduit and localisation by skin marking. The diameter of the leg pre and post operatively as well as wound complications were documented for further statistical analysis.

**Results:** So far from the recruited patients; demographics including age, sex, steroid use, peripheral vascular disease, renal failure and presence of varicosities were similar between the groups (P>0.05). Harvest time was lower within the U/S group (22.3 +-9mins vs 36.3 +-6mins; P=0.02) with a similar bleeding amount, number of repairs and length of vein harvested compared to the non U/S group. The difference between pre and post-operative thigh diameter was significantly higher in the non U/S group (5.5+-3cm vs 1.4+-1.5 cm P=0.02).

**Conclusion:** So far from the data collected we can conclude: 1. U/S assessment of the LSV is feasible, easy to learn and does not demand extra costs or preoperative delays, 2. It significantly reduces surgical harvest time without compromising the conduit quality or bleeding, and 3. Is likely to be associated with lower leg wound complications.

## IGG4 AORTOPATHY: AN UNDERAPPRECIATED CAUSE OF NON-INFECTIOUS THORACIC AORTIC ANEURYSM

Dr Victor **Aguirre**, Dr Catherine Connolly, Mr Robert Stuklis

*Royal Adelaide Hospital, Adelaide, SA*

**Introduction:** IgG4 related disease is a fibro-inflammatory disorder of unknown aetiology, which has an array of clinical presentations depending on specific tissue or organ involvement. Since 2008, non-infectious thoracic aortitis has been recognised as another possible manifestation of IgG4-RD. It is however, often unrecognized and under investigated, causing acute syndromes such as acute aortic dissection.

**Case report:** We report the case of a 57yr female marathon runner who underwent a valve spearing aortic root replacement (David's procedure) for what it was initially thought to be a dilated aortic root and ascending aortic aneurysm. Intraoperatively, acute dissection was recognized with the presence of an adventitial haematoma and a tear in the intima close to the sinotubular junction. Histopathology confirmed the presence of active mural inflammation with microabscess formation and positive IgG4 immunohistochemistry following an extensive investigation of an infectious cause. Her recovery was unremarkable and she was referred and followed by the Immunology department.

**Discussion:** Immunoglobulin G4-related thoracic aortitis is a rare phenomenon. Few population based studies of IgG4-RD have been performed and the epidemiology of the disease remains poorly described. IgG4-RD is a fibro-inflammatory disorder of unknown aetiology and has a multiplicity of clinical manifestations owing to its ability to infiltrate any organs or tissues. Particular features which lend to the diagnosis being made include: storiform fibrosis, dense lymphoplasmatic infiltrate with increased IgG4 plasma cell concentration and/or increased IgG4/IgG ratio, and obliterative phlebitis. In our case, the immunohistochemistry for IgG4 was positive with absence of an infectious organism.

**Conclusion:** 1.This case represents another presentation of IgG4 related thoracic aortitis with acute dissection. 2. Our report demonstrates the difficulties in diagnosing IgG4-RD. 3.This new disease entity is poorly understood and the subtleties of this case exhibit the need for a review of the diagnostic criteria.

## SURGICAL AORTIC VALVE REPLACEMENT FOLLOWING EARLY SAPIENS-XT VALVE FAILURE – A FIRST

Dr Tanveer **Ahmad**, Mr John Goldblatt, Dr Prakash Ludhani, Dr Ronen Gurvitch, Prof James Tatoulis

*Royal Melbourne Hospital, Melbourne, VIC*

Early degeneration of prosthetic aortic valve in Transcatheter aortic valve replacement (TAVR) is a rare complication. We report the case of a 75-year-old woman presented with severe calcific stenosis of Edwards Sapiens-XT valve implanted only 4 years back. She is a Jehovah's Witness and has background of Sjogren's syndrome with secondary cryoglobulinemic vasculitis. She was not a suitable candidate for valve-in-valve TAVR in view of early prosthetic valve failure by calcification. She underwent surgical explantation of the Sapiens XT valve and mechanical aortic valve replacement. To our knowledge, this is the first time that early TAVR valve degeneration and failure of an Edwards Sapiens-XT valve was reported which required surgical replacement with a mechanical valve.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

### SURGICAL MITRAL VALVE REPLACEMENT WITH EDWARDS SAPIEN VALVE – A FIRST

Dr Tanveer **Ahmad**, Dr Prakash Ludhani, Dr Roderic Warren, Mr John Goldblatt, Prof James Tatoulis

*Royal Melbourne Hospital, Melbourne, VIC*

An extensive mitral annular calcification presents a formidable technical challenge during mitral valve surgeries. A 68-year-old female presented to our hospital for surgical treatment of severe mitral stenosis with heavily calcified annulus. She had a background of chemotherapy and radiotherapy for Hodgkin's lymphoma 12 years earlier. In view of heavily and extensive calcification of mitral annulus and subvalvular apparatus, a mitral valve replacement (MVR) using standard prosthetic valve was not possible and she underwent surgical replacement with a transcatheter aortic valve- an Edwards Sapien XT valve. She was not suitable for percutaneous MVR because of heavily calcified anterior mitral leaflet. To our knowledge, this is the first published report of surgical MVR with Edwards Sapien valve. Key words Extensive mitral annular calcification, mitral valve replacement, Trascatheter aortic valve, Edwards Sapien valve

### MICROWAVE ABLATION FOR PULMONARY METASTASES NOT AMENABLE FOR SURGICAL INTERVENTION. CHRISTCHURCH EXPERIENCE

Dr Irina **Baimatova**, Dr Latham Berry, Mr Harsh Singh

*Christchurch Hospital, Canterbury, New Zealand*

**Purpose:** Percutaneous CT guided Microwave Ablation is a viable alternative for treating pulmonary metastases that would normally be inoperable or deemed high risk. Preformed under CT guidance, it enables the tumour to be localised and treated with few complications and risks. Treatment is dependent multiple factors: size, location and patient lung parenchyma. After ablation a CT is preformed to visualise changes in the tissues making sure the tumour has been incorporated into the treatment zone and to check for complications such as a pneumothorax.

**Results:** Six patients have been treated at Christchurch with four patients having at least one year follow up (12-23 months, mean 19.5 and mean). The only complications noted in five patients, was a trivial pneumothorax, requiring no intervention. Three of these four patients are alive at one year. One patient with malignant melanoma died from intracerebral haemorrhage from intracranial metastases. CT scanning at the time showed no recurrence at the site of ablation. Further three patients are awaiting their 6 month scans, with their 6 week scans showing an adequately treated ablation site with no recurrence. One patient has had a second procedure performed and is also awaiting follow up. His initial treatment site is clear of disease.

**Discussion:** Large centres report recurrence at ablation sites as low as 26 % at 6 months, cancer free at 40 months 60% and all-cause mortality 45% . Our early experiences show that this is an effective way of treating cancerous nodules or small metastasis that are not amenable to surgical intervention.

### THE USE OF CHEST RADIOGRAPHY IN PREOPERATIVE ASSESSMENT FOR CARDIAC SURGERY

Dr Irina **Baimatova**, Mr Harsh Singh

*Christchurch Hospital, Canterbury, New Zealand*

**Purpose:** Traditionally chest radiographs were used to provide information about the heart size, pulmonary vasculature and the lungs. Current guidelines still recommend for all patients undergoing cardiac surgery have a preoperative Chest X-ray (CXR). With most patients going for cardiac surgery, the use of ECHO, cardiac angiography and pulmonary functions test adequately address those aspect of the pre-operative work up. The aim of this study is to assess whether the preoperative CXR provide a change to patient care.

**Methodology:** A retrospective review of all patients undergoing cardiac surgery from Jan 2014-Dec 2014, allowing for at least 1 year follow up. Emergency cases that did not receive pull work up were excluded. Results 262 patients underwent an elective or an urgent in-patient cardiac procedure that allowed for full preoperative workup. 7 patients out of 262 has a pulmonary irregularity noted on CXR, of which 5 progressed on to have a CT chest. Only 1 patient had a pulmonary nodule excised at the time of surgery which proved to be benign, otherwise no change in management was seen in this group. All patient had pulmonary function tests which were acceptable to the operating surgeon and the anaesthetist. No patient has subsequently been diagnosed with lung cancer.

**Conclusion:** The use of CXR for pre-operative assessment is outdated and provides little useful additive information needed for cardiac surgery. Only patients with clear indications should be referred for radiography which would lead to improving cardiac unit expenditure, patient time and radiation exposure.

### CALCIUM SENSITIZER IN CARDIAC SURGERY – THE CENTRAL NEW ZEALAND EXPERIENCE

Dr Prakash **Balakrishnan**, Mr Sean Galvin, Mr Barry Mahon, Mr John Riordan, Mr James Mcgiven

*Wellington Hospital, Wellington, New Zealand*

**Purpose:** To review and rationalize the use of Calcium sensitizer 'Levosimendan' in patients undergoing cardiac surgery in our unit, to assess outcomes for patients who had the infusion pre-operatively or intra-/post-operatively and conceptualize its future use in our unit.





## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methodology:** Single institution, retrospective study of patients undergoing cardiac surgery with administration of levosimendan perioperatively over a 5 year period. Data was obtained via the central hospital pharmacy department and cross-referenced with patients records with theatre ORSOS & ICU APACHE II data. Data collection was performed by two registrars, processed and presented in Microsoft Excel format.

**Results:** Approximately 34 patients were identified with 25 patients in the pre-operative group and another 9 patients in the intra/post operative group. Patients in the intra/post-op levosimendan group showed significantly longer ICU stays, hospital days and intubation times. APACHE II Scores are similar for both groups (approximately 25% mortality predicted), however true mortality in intra/post-op group is significantly higher. No patient returned to theatre in both groups. 30 day post-operative mortality for pre-op group was 12% vs. 44.4% in intra/post-op group

**Conclusion:** Our unit revealed promising results despite small numbers. Pre-operative levosimendan administration is associated with shorter ICU and hospital stays, shorter intubation time and lower mortality rates. Rescue administration of levosimendan intra- and post-operatively may not yield significant benefit post-operatively. In our group, pre-operative levosimendan was safely administered in the HDU setting. In selected unwell patients, administration in ICU is necessary for pre-op optimisation.

### CENTRAL NEW ZEALAND SURGICAL EXPERIENCE WITH INTRACARDIAC MYXOMAS

Dr Prakash **Balakrishnan**, Mr Sean Galvin, Mr Barry Mahon, Mr James Mcgiven, Mr John Riordan

*Wellington Hospital, Wellington, New Zealand*

**Purpose:** Atrial myxomas are the most common primary cardiac tumors. More than 90% are solitary. We studied and evaluated its clinical presentation, morbidity, mortality and recurrence following surgery over a period of 5 years.

**Methodology:** Single institution, retrospective study over 5 years period, from Jan 2011 to Dec 2015. All data obtained using the theatre ORSOS database and cross-referencing with the cardiac perfusion logbook database. Preoperative diagnosis was made with clinical presentation and preoperative echocardiography. Complete tumor excision was done and all patients were followed up for recurrence and complications.

**Results:** A total of 18 cases of cardiac myxoma were operated in this 5 year period, which constituted about 0.6% of all cardiac cases operated in our unit. There was a 72.22% female patient predisposition. The left atrial myxoma mostly presented as symptomatic mitral valvular condition and very few presented with embolic and constitutional symptoms. Survival prognosis was 100% alive at one year post operative and no recurrence noted.

**Conclusion:** Cardiac myxomas are so rare. A high index of clinical suspicion is essential for imminent diagnosis. Immediate surgical debulking treatment is indicated in all patients. Cardiac myxomas can be excised with a low rate of mortality and morbidity in our unit.

### EARLY OUTCOMES FOLLOWING MAGNA EASE BIOPROSTHETIC AORTIC VALVE REPLACEMENT

Dr Prakash **Balakrishnan**, Mr Sean Galvin, Mr John Riordan, Mr Barry Mahon, Mr James Mcgiven

*Wellington Hospital, Wellington, New Zealand*

**Purpose:** Aortic valve replacement makes up a huge proportion of cardiothoracic surgical workload in most cardiac surgical units. In our unit, we aim to investigate early post operative outcomes following Magna Ease Aortic valve replacement, in view of valve implant pressure dynamics, paravalvular leaks and incidence of aortic regurgitation. We also described early post operative morbidity and mortality in this study.

**Methods:** Single institution, retrospective data collected of all Carpentier-Edwards Perimount Magna Ease Aortic Heart Valve implants and patients over 3 year period. Implant data was retrieved using theatre ORSOS database, perfusion logbook, cross-referencing with the implant supplier and patient's clinical notes.

**Results:** A total of 151 valve implants were implanted in 150 patients over the 3 year period. Mean age, gender predisposition and other patient characteristics were also measured. All pre-discharge hospital ECHOs were identified and stratified accordingly to measure valve gradients, paravalvular leaks and incidence of any aortic regurgitation. Early post operative morbidities and mortalities were described.

**Conclusion:** Early data shows that the Magna Ease aortic valve implant has a good safety profile in all aspects and more data study is imperative to fully verify this claim.

### SURGICAL MANAGEMENT OF PRIMARY ADULT PRESENTATION OF SEVERE TRICUSPID VALVE AND RIGHT VENTRICULAR HYPOPLASIA IN PATIENT PRESENTING WITH MASSIVE RIGHT ATRIAL THROMBUS

Dr Thilina **Bandara**, Dr Reece Davies, Professor Richard Chard

*Westmead Hospital, Sydney, NSW*

**Purpose:** We report the surgical management of a massive right atrial thrombus secondary to undiagnosed right ventricle and tricuspid valve hypoplasia in a 41 year old female presenting with a right atrial mass and congestive hepatic failure.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methods:** After presenting with increasing abdominal distension and massive abdominal ascites secondary to congestive hepatic failure, transthoracic echocardiogram demonstrated a large echogenic mass in the right atrium and severe tricuspid valve stenosis. Patient underwent surgical management after cardiac MRI and endovascular biopsy were inconclusive. Primary median sternotomy was performed with CPB introduced via ascending aortic cannulation, SVC cannulation, IVC cannulation via right femoral cut down and cooling to 30 degrees Celsius. A right atriotomy was performed and right atrial thrombus was removed with evidence of severe right atrial hypertrophy and severe tricuspid stenosis appearing congenital in nature. The right ventricle was mild to moderately hypoplastic however the pulmonary valve was normal. Subsequent bidirectional Glenn proceedure was achieved by anastomosing the SVC to the right pulmonary artery. Upon rewarming and weaning off CPB, SVC pressures were measured at 18mmHg with excellent haemodynamics.

**Results:** Patient was extubated the following day and had an uneventful recovery. She was discharged home on therapeutic enoxaparin after repeat abdominal ultrasound demonstrated improved hepatic ductal flow.

**Conclusions:** The successful surgical management of this instance of adult congenital heart disease demonstrates that congenital heart disease should be considered in unusual presentations of heart failure even in adult populations with no prior history of congenital disease.

### ATYPICAL INCIDENTAL PRESENTATION OF THYMOLIPOMA WITH MACROSCOPIC APPEARANCE SUGGESTIVE OF MALIGNANCY IN PATIENT UNDERGOING CORONARY ARTERY BYPASS GRAFTING

Dr Thilina **Bandara**, Dr Reece Davies, Dr Himanshu Desai

*Westmead Hospital, Sydney, NSW*

**Purpose:** We report the incidental finding of a thymolipoma in a 61 year old male undergoing urgent CABG with intra-operative findings suggestive of malignant progression.

**Methods:** A 61 year old male undergoing urgent CABG for triple vessel disease was noted to have a large anterior mediastinal mass upon primary median sternotomy. The 5cm mass appeared to be infiltrating the SVC, left innominate vein junction and pericardium, with the appearance highly suggestive of malignancy. Given this, and to ensure full oncological clearance, the mass and infiltrated pericardium was excised along with the wall of the SVC and innominate vein which was subsequently repaired using a bovine pericardial patch. Following this CPB was introduced via 2 stage cannulation and routine coronary artery bypass grafting was performed using LIMA and vein grafts.

**Results:** The patient required a prolonged period of post-operative ventilatory support before being extubated day 4 and went on to have an uneventful recovery. Anatomical histopathology demonstrated the mass was a benign thymolipoma with significant infarction with necrosis and florid histiocytic reaction accounting for the malignant macroscopic appearance. No further follow up was required.

**Conclusions:** Histiocytic reaction in an infarcting anterior mediastinal thymolipoma can present with macroscopic changes highly suggestive of a malignant process in an otherwise benign lesion.

### MITRAL VALVE REPLACEMENT IN MUCOPOLYSACCHARIDOSIS

Dr Douglas **Bell**, Dr Cheng He, Dr John Pauli, Dr Rishendran Naidoo

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** A 29-year-old female with mucopolysaccharidosis type VI (Maroteaux-Lamy syndrome; MLS) presented with symptomatic severe mixed mitral valve disease. The technical challenges of mitral valve surgery in this patient are discussed, with strategies used applicable in patients with similar valve anatomy.

**Methodology:** MLS is an autosomal recessive disorder characterized by a deficiency in the enzyme Arylsulphatase B. Deficiency of this enzyme leads to widespread tissue infiltration of glycosaminoglycan. Cardiac involvement is common in MLS with up to 49% of patients having mitral regurgitation at diagnosis. Our young patient presented with NYHA class III and echocardiography revealed severe regurgitation and stenosis (mean gradient 10 mmHg) across a diffusely thickened valve, with thickening and retraction of the subvalvular apparatus. A small mitral valve annulus was seen at operation along with calcification of the anterior mitral leaflet and gross bileaflet thickening. A 21 mm mechanical aortic prosthesis was successfully implanted in an inverted fashion, using mattress pledgetted polyester sutures.

**Results:** Recovery was unremarkable and she was discharged home on postoperative day six. Echocardiography at discharge and at 1-year follow-up showed satisfactory valve haemodynamics with no paravalvular leak. NYHA class normalised to I at 1-year review.

**Conclusion:** We describe a successful case of mitral valve replacement in a patient with a genetic condition that poses numerous challenges to the cardiac surgeon, with satisfactory valve haemodynamics and clinical function at one-year follow-up. Although uncommon, the inversion technique described may equally be applied to any patient with a small mitral annulus.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

### SIMPLIFIED SURGICAL TECHNIQUE FOR THE MANAGEMENT OF SEVERE MITRAL ANNULUS CALCIFICATION

Dr Philippa **Bowers**, Dr Manu Mathur

*Royal North Shore Hospital, Sydney, NSW*

**Purpose:** Severe mitral annular calcification (MAC) is occasionally associated with degenerative mitral valve dysfunction especially in the elderly and renal patients. Dealing with the MAC at the time of mitral valve replacement is difficult and hazardous. Currently two techniques exist. The first involves extensive decalcification of the annulus followed by pericardial patching of the resulting gusset. The second technique is where the prosthesis is sutured within the atrium creating a new annulus. Complications of the first include atrioventricular disruption, circumflex artery injury and ventricular rupture while the second technique is associated with paravalvular leak, valve dehiscence and thromboembolism.

**Methodology:** We describe an extremely simple yet effective technique for valve replacement in the setting of severe MAC. The technique involves inserting the valve at its usual level within the annulus and native mitral valve with a pericardial collar that covers the severe MAC and is sutured to the atrium several centimetres from the prosthesis-sewing ring.

**Results:** Eight elderly patients underwent this procedure. Majority of patients had surgery for mitral regurgitation or mixed mitral disease. There was one early post-operative death due to pulmonary artery rupture secondary to Swan-Ganz catheter injury. There were no other complications in the remaining seven in particular no strokes. There were no paravalvular leaks seen on intra-operative TOE or early and late follow-up TTE. On long-term follow-up there has been no reoperations or complications associated with this technique.

**Conclusion:** This technique is simpler, safer and with better outcomes than previous described techniques.

### RECANNULATION OF AXILLARY ARTERY IN COMPLEX CARDIAC SURGERY

Dr Philippa **Bowers**, Dr Manu Mathur

*Royal North Shore Hospital, Sydney, NSW*

**Purpose:** Axillary artery cannulation for complex surgery is now well recognised as being safe and reliable, with improved outcomes. Benefits include facilitating antegrade cerebral perfusion, avoidance of malperfusion, and stroke reduction due to reduction in microemboli. With its increasing popularity axillary cannulation is being more widely used increasing the likelihood of patients requiring a second operation where ideally recannulation of the axillary artery would be the preferred option. This case series reports our experience of re-using the axillary artery for cannulation in complex cardiac cases.

**Methodology:** This study is a retrospective case series looking at experience of re-using axillary artery for cannulation. Operative technique is described as well as the indications for both the first and second cannulations are recorded including any associated complications.

**Results:** Seven patients have undergone recannulation of their axillary arteries. In half the cases the old Dacron graft stump was excised and a new graft was anastomosed, the remaining cases a new end-to-side anastomosis was performed either proximal or distal to the original graft stump. There were no deaths or strokes in this high-risk group but in one case axillary cannulation was aborted due to high line pressures. The other cases all had adequate perfusion via the recannulated axillary artery.

**Conclusion:** Given the rising popularity of axillary cannulation it is likely that surgeons will be faced with the need and desire to recannulate the axillary artery in the future. This series shows that recannulation of the axillary artery is not only achievable but simple and safe and should be strongly considered in redo aortic and complex cardiac surgery.

### ACTIVE CLEARANCE OF CHEST DRAINS TO OPTIMIZE PATIENT OUTCOMES AFTER CARDIAC SURGERY

Dr Edward **Boyle**

*St. Charles Medical Center, Bend, Oregon, USA*

An absolute requirement for all open cardiothoracic surgical procedures is adequate evacuation of mediastinal and pleural shed blood by chest drains in early postoperative recovery. Chest drains, however, are known to have a 36% rate of tube occlusion, which can contribute to retained blood around the heart and lungs in approximately 20% of patients.1,2,3 Recent clinical evidence suggests a link between chest tube occlusion and retained blood with a more complicated and expensive recovery as well as postoperative atrial fibrillation (POAF). 1,2,3 Current methods to prevent or treat chest tube clogging such as milking or stripping are not effective, and may be harmful. To address the unmet need for reliable chest drain patency, active clearance technology was developed to minimize chest tube clogging at the bedside in the ICU. Studies have shown this can prevent chest tube occlusion, and by keeping chest tubes free of obstructing clot, retained blood is reduced.4,5,6,7 Further, this appears to significantly reduce POAF.8,9 The mechanism of reduced POAF appears to be that POAF is triggered by the oxidative inflammation that results in the postoperative pericardial space in susceptible patients with retained blood. Recently published clinical evidence suggests that actively clearing chest drains in the first 24 hours after cardiac surgery decreases the need for interventions for retained blood by 43% in propensity matched subjects, as well as a marked reduction in POAF.8,9 In high risk patient populations, such as patients requiring ventricular assist device implantation, active clearance of chest drains has been shown to significantly reduce the need

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

for re-exploration for bleeding and delayed sternal closure.10 These studies suggest that it is worthwhile to develop protocols to actively maintain chest tube patency during early recovery after cardiac surgery.

### DEEP DIVE INTO HOSPITAL PERFORMANCE FOR PCI FOR ACUTE STEMI: THE VICTORIAN CARDIAC OUTCOMES REGISTRY (VCOR)

Ms Angela **Brennan**, Dr Diem Dinh, Prof Chris Reid, Dr Dion Stub, A/Prof Jeffrey Lefkovits

*Monash University, Melbourne, VIC*

**Background:** The VCOR PCI registry has grown to become the primary method of measuring and benchmarking the performance and safety of PCI in Victoria. It is a state-wide clinical quality registry with almost all hospitals performing PCI in Victoria contributing. VCOR provides insights into overall trends in hospitals' quality performance, with quarterly, annual and ad-hoc reporting. We undertook a detailed analysis (deep dive) of hospital performance related to PCI for acute STEMI to gain insights into factors that influence the quality of care.

**Methods:** 13 public and 10 private hospitals contribute baseline, procedural, in-hospital and 30-day outcomes via a secure web-based system. All sites receive quarterly reports providing individualised comparative outcomes.

**Results:** 1133 consecutive STEMI patients were treated over a 12-month period from July 2014; 39% in private hospitals. The mean age was 62±12.6yrs. Females comprised 19%. Pre-hospital notification (PHN) of STEMI by faxed ECG occurred in 48%. Median door-to-balloon (DTB) time for the overall cohort was 69 min (IQR 46-100). Median compliance with DBT<90min was 69% (range 46%-87%). PHN improved compliance for DBT<90min by 34% compared with no PHN. Many health services exhibited a fall-off in performance for out-of-hours cases, with a reduction in compliance rate to 64% (range 36%-80%). Compliance with DBT <90 min did not influence mortality or length of stay.

**Conclusion:** Detailed analysis of performance measures for PCI for STEMI reveals variation across Victorian hospitals and compliance with door-to-balloon times<90min below target. Improving out-of-hrs delays and use of pre-hospital notification have measurable beneficial effects on performance.

### TRANSOESOPHAGEAL ECHOCARDIOGRAPHY GUIDANCE OF ANTEGRADE CARDIOPLEGIA DELIVERY FOR CARDIAC SURGERY

A/Prof David **Canty**, Dr Prashant Joshi, Prof Colin Royse, Mr James Mcmillan, Ms Sarah Tayeh, Prof Julian Smith

*Department of Surgery, University of Melbourne, VIC*

**Purpose:** The initial volume of antegrade cardioplegia used to induce asystole during aortic cross-clamp still is based on empiric methods and may be excessive, potentially leading to hyperkalemia, myocardial oedema, and acute left ventricular (LV) distention from aortic regurgitation (AR). The objectives were to determine whether the volume of cardioplegia required to induce asystole is proportional to LV mass, and whether the degree of LV distention is proportional to the severity of AR as measured with intra-operative transoesophageal echocardiography (TOE).

**Methodology:** In this ethics approved prospective observational study at two institutions, TOE was used to estimate LV mass (prolate ellipse revolution formula), quantify AR, and monitor for LV distention during initial antegrade cardioplegia delivery in 58 adult patients scheduled for cardiac surgery requiring aortic cross-clamping. The volume of cardioplegia required for asystole was recorded.

**Results:** There was a weak correlation of LV mass and antegrade cardioplegia volume required for asystole (r=0.35, p=0.047). The degree of LV distention correlated moderately with the severity of AR (r = 0.55, p = 0.007) and was excessive and stopped early (aborted) due to excessive LV distension in 24% of all patients, including 18% of 39 patients without AR. An AR vena contracta of 0.3cm predicted aborted cardioplegia with modest accuracy (AUC 0.81, 0.66-0.99, p=0.02, sensitivity 71%, specifity 81%).

**Conclusion:** Estimated LV mass is not a useful predictor of the initial volume of antegrade cardioplegia required to induce asystole. However, TOE can predict and monitor for LV distention, which is common.

### A PILOT ASSESSMENT OF THREE POINT-OF-CARE STRATEGIES FOR DIAGNOSIS OF PERIOPERATIVE LUNG PATHOLOGY IN CARDIOTHORACIC SURGERY

A/Prof David **Canty**, Dr John Ford, Dr Johan Heiberg, Dr Anthony Brennan, Prof Colin Royse, Dr Doa El-Ansary, Prof Alistair Royse

*University of Melbourne, Melbourne, VIC*

**Background:** Lung ultrasound (LU) is superior to clinical examination and chest X-ray (CXR) in diagnosis of acute respiratory pathology in critical care but has not been reported before and after cardiothoracic surgery on the ward.

**Methods:** Ethics approved prospective observational study in consenting patients who received a CXR on the ward before or after cardiac or thoracic surgery. Two clinicians performed

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standardised clinical assessment followed by LU. Incidence of atelectasis, consolidation, alveolar-interstitial syndrome, pleural effusion and pneumothorax were compared between clinical examination, CXR and LU (reference method) using pre-defined diagnostic criteria in three lung zones.

**Results:** Respiratory pathology was detected with LU in 56% (24% preoperatively and 94% postoperatively) of the 78 patients. Intraobserver agreement was better with LU (0.84-0.97) than clinical examination (0.28-0.70). Pathology was found with LU in 32 % of lung zones, and included atelectasis (11% of zones), effusion (9%), alveolar interstitial syndrome (5%), consolidation (4%) and pneumothorax (2.5%). Compared with LU, agreement in diagnosis was poor (CXR 42%, clinical examination 34 % and combined 56%), sensitivity was poor to modest (CXR 7-69%, clinical examination 7-76% and combined 14-94%) and specificity was good (CXR 91-98%, clinical examination 90%-99% and from combined 82%-97%), and correlation was modest (CXR 0.11-0.64 and clinical examination 0.08-0.7). Correlation between clinical examination and CXR was poor (0-0.58).

**Conclusions:** Respiratory pathology is detected commonly with LU when used routinely before and after cardiothoracic surgery and is frequently missed by CXR and clinical examination.

### COMPARISON OF CARDIAC OUTPUT OF BOTH 2 AND 3 DIMENSIONAL TRANSOESOPHAGEAL ECHOCARDIOGRAPHY WITH TRANSPULMONARY THERMODILUTION DURING CARDIAC SURGERY

A/Prof David **Canty**, Dr Martin Kim, Dr Ranj Guha, Dr Tuan Pham, Prof Alistair Royse, Prof Colin Royse

*Department of Surgery, University of Melbourne, Melbourne, VIC*

**Purpose:** Transpulmonary thermodilution (TD) is the gold standard for cardiac output (CO) monitoring during cardiac surgery but is feasible with TOE, but 2D TOE underestimates CO due to assumption of a circular LVOT, when 3-D TOE demonstrates it is ovoid. The aim of this study is to determine if 3-D TOE correlates better with TD than 2-D TOE.

**Methodology:** After ethics approval, 50 adult patients without more than mild valvular regurgitation or A.F. who were scheduled for onbypass cardiac surgery were recruited prospectively at two institutions. CO was measured simultaneously by TD and TOE (2D/3D) before and after CPB. CO was calculated using the continuity method (product of VTI, area and heart rate) using the modal and outer-edge trace of the LVOT VTI. The aortic valve area was estimated with planimetry by both 2D and 3D TOE. Agreement analysis was performed using the Deming model II regression analysis and Bland-Altman technique (TD as the reference method).

**Results:** Proportional but not fixed bias was present for the VTI modal method but not for any other method. Correlation for LVOT modal was poor (0.40) and CO was underestimated (mean bias = -1.59 L.min-1), but the limits of agreement were similar to other methods. Tracing the edge of the LVOT VTI rather than the modal line reduced the bias (-0.59 L.min-1), and improved correlation (0.92). 3D planimetry of the AV and continuous wave Doppler had the best agreement with TD. The mean bias approached zero for the 3-D methods but with similar limits of agreement.

**Conclusion:** For 2D measurements, tracing around the LVOT VTI rather than through the modal line improved precision. The other 2D and 3D measurements of CO showed absence of bias, and reasonable agreement with TD.

### SYSTEMATIC REVIEW AND META-ANALYSIS OF UNIPORTAL VERSUS MULTIPORTAL VIDEO- ASSISTED THORACOSCOPIC LOBECTOMY FOR LUNG CANCER

Dr Christopher **Cao**, Christopher Harris, Rebecca James, David Tian, Mathew Doyle, Diego Gonzalez-Rivas, Tristan Yan

*The Collaborative Research (CORE) Group, Macquarie, NSW*

**Background:** Uniportal video-assisted thoracoscopic surgery (VATS) has emerged as a less invasive alternative to the conventional multiportal approach in the treatment of lung cancer. The benefits of this uniportal technique have not yet been characterized in patients undergoing VATS lobectomy. This meta-analysis aimed to compare the clinical outcomes of uniportal and multiportal VATS lobectomy for patients with lung cancer.

**Methods:** A systematic review was conducted using seven electronic databases. Endpoints for analysis included perioperative mortality and morbidity, operative time, length of hospital stay, perioperative blood loss, duration of postoperative drainage and rates of conversion to open thoracotomy.

**Results:** Eight relevant observational studies were identified and included for meta-analysis. Results demonstrated a statistically significant reduction in the overall rate of complications, length of hospital stay and duration of postoperative drainage for patients who underwent uniportal VATS lobectomy. There were no significant differences between the two treatment groups in regard to mortality, operative time, perioperative blood loss and rate of conversion to open thoracotomy.

**Conclusions:** The present meta-analysis demonstrated favourable outcomes for uniportal VATS lobectomy in the treatment of lung cancer compared to the conventional multiportal approach. However, long-term follow-up data is still needed to further characterize the benefits of the uniportal approach.

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### A META-ANALYSIS OF MITRAL VALVE REPAIR VERSUS REPLACEMENT FOR ISCHEMIC MITRAL REGURGITATION

Dr Christopher **Cao**, Sohaib Virk, Arunan Sriravindrarajah, Douglass Dunn, Kevin Liou, Hugh Wolfenden

*The Collaborative Research (CORE) Group, Macquarie, NSW*

**Background:** The development of ischemic mitral regurgitation (IMR) portends a poor prognosis and is associated with adverse long-term outcomes. Although both mitral valve repair (MVr) and mitral valve replacement (MVR) have been performed in the surgical management of IMR, uncertainty remains regarding the optimal approach. The aim of this study was to meta-analyse these two procedures, with mortality as the primary endpoint.

**Methods:** Seven databases were systematically searched for studies reporting peri-operative or late mortality following MVr and MVR for IMR. Data were independently extracted by two reviewers and meta-analysed according to pre-defined study selection criteria and clinical endpoints.

**Results:** Overall, 22 observational studies (n=3,815 patients) and one randomized controlled trial (n=251) were included. Meta-analysis demonstrated significantly reduced peri-operative mortality [relative risk (RR) 0.61; 95% confidence intervals (CI), 0.47-0.77; I2=0%; P<0.001] and late mortality (RR, 0.78; 95% CI, 0.67-0.92; I2=0%; P=0.002) following MVr. This finding was more pronounced in studies with longer follow-up beyond 3 years. At latest follow-up, recurrence of at least moderate mitral regurgitation (MR) was higher following MVr (RR, 5.21; 95% CI, 2.66-10.22; I2=46%; P<0.001) but the incidence of mitral valve re-operations were similar.

**Conclusions:** In the present meta-analysis, MVr was associated with reduced peri-operative and late mortality compared to MVR, despite an increased recurrence of at least moderate MR at follow-up. These findings must be considered within the context of the differing patient characteristics that may affect allocation to MVr or MVR. Larger prospective studies are warranted to further compare long-term survival and freedom from re-intervention.

### A SYSTEMATIC REVIEW AND META-ANALYSIS OF MULTIDETECTOR COMPUTED TOMOGRAPHY

Dr Christopher **Cao**, Michael Chan, Douglas Dunn, David Tian, Kevin Liou, Chaitu Cheruvu

*The Collaborative Research Group, Macquarie Unive, NSW*

**Background:** The present meta-analysis compared the diagnostic accuracy of more recent computed tomography coronary angiography (CTCA) with invasive coronary angiography (ICA) in the assessment of graft patency after coronary artery bypass graft surgery (CABG).

**Method:** A systematic review was performed using nine electronic databases from their dates of inception to July 2015. Predefined inclusion criteria included studies reporting on comparative outcomes using ¡Ý64 slice multi-detector computed tomography (MDCT) and ICA. The primary endpoints included graft occlusion and significant graft stenosis ¡Ý50%. Secondary analyses included the comparison of arterial versus venous graft conduits, and the use of different MDCT techniques.

**Results:** Thirty-one studies were identified according to selection criteria, involving 1975 patients with 5364 assessed grafts. Combined assessment of stenosis and occlusion for all grafts demonstrated a sensitivity of 96.1% [95% confidence interval (CI) 94.3-97.4%] and specificity of 96.3% (95% CI 95.1-97.3%). CTCA assessment of venous grafts demonstrated higher sensitivity compared to arterial grafts, when testing for both occlusion and stenosis (97.6% vs. 89.2%, p=0.004).

**Conclusion:** Results of this study demonstrated that CTCA had a relatively high pooled sensitivity, specificity and negative predictive value compared to ICA. However, patient baseline characteristics varied between studies, and the results should be interpreted with caution. Nonetheless, our results indicate that CTCA should be recognized as an accurate and non-invasive investigation for graft patency in symptomatic patients after CABG.

### TOTALLY ENDOSCOPIC CORONARY ARTERY BYPASS: A SYSTEMATIC REVIEW

Dr Christopher **Cao**, Dr Praveen Indraratna, Dr Mathew Doyle, Dr Sohaib Virk

*The Collaborative Research (CORE) Group, Macquarie, New South Wales*

**Background:** Coronary artery bypass graft (CABG) surgery through sternotomy remains to be the standard treatment for selected patients with coronary artery disease. Recently, totally endoscopic coronary artery bypass (TECAB) procedures have been performed to minimise complications related to sternotomy with the additional goal of faster postoperative recovery. However, there is a paucity of robust clinical data on this novel technique. The aim of the present study was to assess the perioperative and mid-term outcomes of TECAB.

**Methods:** A systematic review was performed using nine electronic databases from their dates of inception to January 2016. Predefined inclusion criteria included studies reporting on perioperative mortality outcomes of patients who underwent TECAB.

**Results:** Twenty-four studies were identified according to selection criteria, including 20 reports on TECAB and four studies comparing TECAB with conventional CABG. The median perioperative mortality rate was 0.3%. Other perioperative outcomes included graft occlusion (1.2%), myocardial infarction (0.5%) stroke (0.5%), conversion to sternotomy (5.2%), and wound infection (1.0%). Median operative time was 228 minutes. Median hospitalisation period was 4 days. There was insufficient comparative data for meta-analysis. Mid-term mortality outcomes for TECAB at the time of latest follow-up was <1%.

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**Conclusion:** The present systematic review presented the most comprehensive data on TECAB to date. Our results indicated that TECAB can be performed safely in specialised centres for selected patients, with acceptable perioperative outcomes. Future prospective studies should focus on comparing TECAB with conventional CABG and refine the patient selection process in the context of hybrid procedures.

### A CASE OF POSTERIOR MEDIASTINAL CYST OF MULLERIAN TYPE (HATTORI'S CYSTS)

Dr Nikhil **Chandra**, Mr Siven Seevanayagam

*Austin Health, Melbourne, VIC*

Cysts in the mediastinum have been previously reported in the literature as being acquired or congenital (1). The most common of these being Bronchogenic cysts, neuroenteric cysts, oesophageal duplication cysts, pericardial cysts and schwanommas more specific to the posterior mediastinum. We describe a 52 year old female who presented with a 2 month history of intermittent chest pain and shortness of breath and more recently transient numbness down her left arm. Chest X-ray showed a 6cm posterior mediastinal mass from T4-T7, with normal cardio-mediastinal contours. She had a CT and MRI of the thoracic spine that revealed a 4.8 x 3.9cm left paraspinal cystic lesion from T3-T5 with no widening of the neural exit foraminae nor extension through them. She underwent thoracoscopic excision of the cyst with the impression being a neuroenteric/neurogenic cyst. However to our surprise histopathology showed a benign cyst of mullerian type as first described by Hattori in 2005 (2) . She was discharged day 1 post-operatively with no immediate complications and reviewed withing one month with a normal Chest X-ray and resolution of symptoms.
1. Cystic intrathoracic derivatives of the foregut and their complications. Kirwan WO, Walbaum PR, McCormack RJ. 2. Hattori H. Ciliated cyst of probable mullerian origin arising in the posterior mediastinum. Virchows Arch 2005;446:82-4

### SURGICAL PLICATION OF IDIOPATHIC PULMONARY ARTERY ANEURYSM

Dr Nikhil **Chandra**, Mr Siven Seevanayagam, Ms Livia Williams

*Austin Health, Melbourne, VIC*

A 44 year old lady was transferred to our Hospital with an overnight history of central chest pain radiating to her back and increasing shortness of breath on exertion. This is on a background of having been diagnosed with a main pulmonary artery aneurysm and non-obstructive coronary artery disease one year prior, after presenting to the emergency department with multiple syncopal episodes, chest pain and dyspnoea on exertion. Chest X-ray showed an abnormal left cardio-mediastinal contour. Transthoracic echocardiography revealed a bicuspid pulmonary valve with mild stenosis and regurgitation, PAP (Pulmonary artery pressure) - 20mmHG. CTPA at the original presentation showed maximal main PA diameter of 60mm with no aneurysmal involvement of the right and left pulmonary branches. She had no features suggestive of connective tissue disorders. CTPA on this admission however, showed an alarming increase in the maximal main PA diameter of 64.7mm with a new finding of left PA enlargement measuring 33mm. There was no dissection in the the PA wall. She underwent plication of the pulmonary artery extending into the left PA to a final size of <30mm by direct measurement. She was discharged on the 7th post-operative day without any complications. Follow up CTPA at 6 months showed no further enlargement of the main PA.

**References:** 1. Idiopathic Pulmonary Artery Aneurysm. Masaru Seguchi, MD; Hiroshi Wada, MD; Kenichi Sakakura, MD; Norifumi Kubo, MD; Nahoko Ikeda, MD; Yoshitaka Sugawara, MD; Atsushi Yamaguchi, MD; Junya Ako, MD; Shin-ichi Momomura, MD. 2. Surgical treatment of a pulmonary artery aneurysm Nicola Vistarini, Stéphane Aubert*, Iradj Gandjbakhch and Alain Pavie.

### ENHANCED RECOVERY OF DONATION AFTER CIRCULATORY DEATH(DCD) HEARTS USING ANTE-MORTEM HEPARIN AND SUPPLEMENTED CELSIOR IN A RODENT MODEL

Dr Hong Chee **Chew**, Dr Ling Gao, Dr Jeanette Villanueva, Dr Mark Hicks, Assoc. Professor Kumud Dhital, Professor Peter Macdonald

*Victor Chang Cardiac Research Institute, Sydney, NSW*

**Aim:** To Develop a DCD rodent model to investigate the role of adjunct therapies in enhancing the recovery of DCD hearts.

**Method:** Male Wistar rats (n=24), 350-450g, are subjected to DCD conditions. Carotid artery is cannulated for pressure monitoring and saturation monitored using pulse oximetry. Withdrawal induced by ligation of the trachea. Five groups were studied: I. Electrical Asystole + Celsior (C) Flush (CA) II. C without perimortem heparin (C w/o Hep)* III. C with perimortem heparin (C + Hep)* IV. Supplemented C without perimortem heparin (Cs w/o Hep)* V. Supplemented C with perimortem heparin (Cs + Hep)* (*Heart was subjected to 12 minutes of warm ischaemia (WIT)) The heart is excised and preserved in cold C solution immediately. Preservation flush (100mls) is delivered via aortic cannula at a flow rate between 20-30ml/min. The aorta and left atrium(LA) are installed on ex-vivo circuit and the heart is reperfused with 37c oxygenated Krebs solution for 30 mins. Later, the flow is redirected to the LA to mimic 'working' mode for a further 30min. Functional data i.e. heart rate (HR), aortic pressure (MAP), coronary flow (CF) and aortic flow (AF) are recorded.

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**Results:** WIT in Group 1 is 27.2 ± 3.6 vs 17.6 ± 1.8min in other groups. Mean HR, MAP, CF and AF recovery in each group at 30 mins is presented in table below: I II III IV V HR (bpm) 157.23 185.19 243.87 246.1 249.82 MAP (mmHg) 49.22 27.24 54.95 43.18 82.45 AF (ml/min) -1.175 -0.61 5.73 3.78 10.42@ CF (ml/min) 2.74 7.38 16.8 5.38 16.58# CO (ml/min) 2.13 6.77 22.53 9.16 27* @ $p<0.05$ vs groups II and IV; # $p < 0.05$ vs group IV; * $p < 0.05$ vs groups I, II and IV Superior CF is seen with the addition of ante-mortem heparin whilst supplementation of preservation solution leads to enhanced AF recovery. The combination of supplemented C and ante-mortem heparin results in recovery of all hearts within the group.

**Conclusion:** Current model demonstrates synergistic activity when using ante-mortem heparin in tandem with supplemented C.

### HYBRID CORONARY REVASCULARISATION IN A PATIENT WITH RADIATION INDUCED PORCELAIN AORTA

Dr Tze Yang **Chin**, Dr Lawrence Nair, Dr Brendan Bell, Dr Bruce Thomson

*The Prince Charles Hospital, Brisbane, QLD*

In patients with multivessel coronary artery disease (CAD) involving the left main coronary artery (LMCA), current evidence indicates that coronary artery bypass grafting offers superior long term survival and lower rates of repeat revascularisation, but an increased risk of short term stroke when compared to percutaneous coronary intervention (PCI). The favourable outcomes stem from superior long term patency of the left internal thoracic artery graft (LITA) to the left anterior descending artery (LAD). The superiority of other conduits compared to PCI are less clear. Hybrid coronary revascularisation (HCR) offers an alternative that reduces perioperative risk whilst maximising long term benefit. We present the case of a 58-year-old male with an 80% stenosis of his LMCA, critical ostial stenosis of his right coronary artery (RCA), and extensive calcification of his aorta due to previous radiotherapy for lymphoma. He also had a previous mechanical aortic valve replacement for radiation induced aortic stenosis. As CT showed his LITA was patent, he underwent HCR, utilising the LITA graft to his LAD via median sternotomy, without the use of cardiopulmonary bypass, and a drug eluting stent to his RCA. Due to his calcified aorta, this approach reduced his risk of peri-operative stroke whilst still utilising the superiority of his LITA. His post-operative course was complicated by intrathoracic bleeding, which eventually resolved. He was discharged on post-operative day 23 with no neurological deficit. In conclusion, with the increasing prevalence of high-risk patients with multivessel CAD or LMCA disease, HCR is a valuable alternative, and will be a useful technique in the armamentarium of any heart care centres.

### SURGICAL VS NON-SURGICAL MANAGEMENT OF PLEURAL EMPYEMA: A META-ANALYSIS

Dr Tze Yang **Chin**, Dr Mark Redden, Dr Charlie C-T Hsu, Dr Mieke Van Driel

*University of Queensland, Brisbane, QLD*

**Purpose:** There is currently no consensus on the optimal treatment regimen for pleural empyema, with surgical decortication attracting interest due to recent advances in video-assisted thoracoscopic surgery (VATS). Some centres advocate early decortication, whilst others continue to prefer a trial of chest tube drainage (CTD) prior to surgical intervention. This meta-analysis sought to assess the evidence regarding non-surgical vs early surgical options.

**Methodology:** Electronic searches were performed using six databases from their inception to July 2015, identifying all relevant randomized controlled trials (RCT) that compared a surgical versus a non-surgical method of pleural empyema management.

**Results:** Eight RCTs with 391 participants were included. Six of these focused on paediatric population and two on adults, with seven comparing CTD to VATS decortication, whilst one paediatric trial compared CTD to open decortication. The study (n=30) comparing open decortication to CTD reported no deaths in either arm, but showed a reduction in length of hospital stay (9.5 vs 15.4 $p<0.05$), and less procedural complications ($p=<0.05$). In the seven studies (n=361) comparing VATS decortication versus CTD, there were one mortality in each group, and a reduction in length of hospital stay (mean difference -2.52 $p<0.05$). There was no statistically significant difference in procedural complications rate.

**Conclusions:** Our findings suggest early surgical management of pleural empyema may reduce length of hospital stay when compared to CTD, without an increased risk of procedural complications. However, these were based on limited number of studies and sample size. Future RCTs with larger sample sizes are required to validate our findings.

### SPONTANEOUS INTERCOSTAL ARTERY HAEMORRHAGE: A CASE REPORT

Dr Tara **Clinick**, Dr Hyok Jun Kwon, Mr Sean Galvin

*Wellington Hospital, Wellington, New Zealand*

Spontaneous haemorrhage of an intercostal artery rarely occurs without preceding trauma or an associated illness such as neurofibromatosis. This report describes an 86 year old woman on aspirin who presented following sudden onset of severe right sided lower chest and flank pain with no history of trauma or coughing. She was found to have a large superficial haematoma lying postero-lateral to the right 5-11th ribs with active haemorrhage arising from the 5th intercostal vessel on CT. She was admitted to hospital

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for observation and managed non-operatively. There are very few case reports in the literature documenting spontaneous rupture of an intercostal artery in the absence of injury or certain associated conditions. To our knowledge, this is the 4th documented case.

### IATROGENIC PNEUMOTHORAX FROM ACUPUNCTURE

Dr Tara **Clinick**, Dr Hyok Jun Kwon, Mr Barry Mahon, Mr Sean Galvin

*Wellington Hospital, Wellington, New Zealand*

**Case Report:** A 27 year old man experienced right chest pain immediately after acupuncture to his upper back. On examination, his oxygen saturations were 98% at room air, with a respiratory rate of 16/min. His right chest was hyper-resonant on percussion, with reduced air entry on auscultation. A chest x-ray showed a right pneumothorax with an apex to pleural distance of 41mm. The patient was admitted for observation, with reduction in the size of the pneumothorax on interval chest x-ray. He was discharged after 3 days and follow up imaging 3 weeks later showed complete resolution of the pneumothorax.

**Discussion:** Acupuncture is rising in popularity in New Zealand. Proponents claim benefits for a wide range of conditions, despite limited evidence of efficacy and the paucity of high quality clinical studies. Cochrane reviews do suggest moderate levels of evidence of benefit in fibromyalgia and neck pain. Complications from acupuncture are not widely known. A Health and Disability Commissioner case report in 2008 found informed consent regarding the possibility of organ damage with acupuncture was inadequate. As of July 2016, the website of Acupuncture NZ only describes minor bruising as a complication. A 30 year Chinese review of 115 published articles described a number of serious complications, including 201 cases of pneumothorax. Two prior cases of pneumothorax following acupuncture have been reported in New Zealand, though the true incidence is likely to be under reported.

**Conclusion:** We hope to raise awareness of this rare but potentially life threatening complication of acupuncture. Patients undergoing alternative medical treatments have the same right to informed consent as they do in any other healthcare setting.

### LAPAROSCOPIC ASSISTED THORACIC OMENTOPLASTY – A TREATMENT FOR SERIOUS AND REFRACTORY COMPLICATIONS OF CARDIOTHORACIC SURGERY.

Dr Neil **Curran**, Assoc Professor Doug Fenton-Lee

*St Vincents Hospital, Sydney, NSW*

**Introduction:** The greater omentum, sometimes referred to as the "policeman of the abdomen" is an organ with unique properties due to its rich vascularity and immunological function. Surgeons have utilized these properties to advantage in a variety of procedures. The favourable anatomical blood supply of the omentum allows it to be mobilised and used as a pedicled flap. To reduce the morbidity of a laparotomy, laparoscopically fashioned omental flaps have now been described for management of thoracic disorders including major sternal wound infections, mediastinitis and complex chest wall reconstruction.

**Aim:** We present two cardiothoracic patients with difficult to manage surgical complications; both patients were successfully treated using a laparoscopic fashioned omental flap. o Patient 1. A cardiac transplant recipient developed a persistent mediastinal fungal infection, which caused dehiscence of the aortic suture-line and near death. Omentoplasty was used as an adjunct to allograft aortic root replacement. There has been no evidence of fungal infection following this procedure. o Patient 2. A patient developed a bronchopleural fistula after pneumonectomy for bronchial carcinoma; this fistula persisted despite surgical oversewing of the bronchial stump and multiple attempts at bronchoscopic fibrin sealing. Omentoplasty successfully sealed the persistent fistula.

**Conclusion:** The key points in laparoscopic omental mobilisation for thoracic omentoplasty are also presented with a review of the literature. The general and cardiothoracic surgeons at our institution have found laparoscopically assisted thoracic omentoplasty to be a safe and successful method of treating difficult complications of chest surgery.

### PLEURAL AND PULMONARY SOLITARY FIBROUS TUMOURS: OUR EXPERIENCE WITH THIS RARE TUMOUR

Dr Yuvaraj **Davidson** Thyagarajan Abraham, Dr Nicky Kingston, Mr Tharumendiran Ramanathan, Mr Peter M Alison, Mr Parma Nand, Mr David Haydock, Mr Amul Kumar Sibal

*Auckland District Health Board, Auckland, New Zealand*

**Purpose:** Solitary Fibrous Tumours(SFT) are a rare entity with a frequency of occurrence of SFTs arising from the pleura estimated at 2.8 per 100,000. We report our experience with the clinico-pathological characteristics, management and outcomes of treatment of pleural and pulmonary solitary fibrous tumours over the past eleven years. We also present an overview on Solitary Fibrous Tumours of the Lung and Pleura based on the existing literature.

**Methodology:** Clinical notes and investigations of patients operated for Solitary Fibrous Tumours of the lung and pleura between 2005 and 2015 were retrospectively reviewed. A literature review on this condition was done.

**Results:** Thirteen patients (7 male and 6 female) underwent surgical treatment of Pleural / Pulmonary SFTs between 2005 and 2015. The mean follow up was 41 months. There was no in-hospital / 30 day mortality. Only 800 cases have been

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reported until 2002. Though there is no clear demarcation between benign and malignant tumours, a mitotic rate of >4 mitoses per 2mm squared is the most reliable indicator of aggressive behaviour.

**Conclusion:** Pleural / pulmonary SFTs are rare tumours which are often asymptomatic. Complete surgical excision offers the best prospect of cure. Regular long term radiological surveillance provides the best chance of detecting and treating recurrences early.

### CABG FOR TRIPPLE VESSELS DISEASE IN PATIENT WITH SEVERED CAROTID STENOSIS

Prof Que **Do**, Dr Trung Nguyen

*Thongnhat hospital, Ho Chi Minh, Vietnam*

**Background:** CABG surgery for patients who had multivessels disease based on superior graft patency, reduced cardiac-retaled eventsand enhanced survival when compared with patients receiving PCI or medical treatment. This study aimed at evaluating the feasibility of total coronary bypass in patients with multi-vessels diseases and severed carotid stenosis. We also analyzed short-term results including post operative mortality and morbidity of the technique and long-term results.

**Methods:** This is a prospective clinical trial including 20 patients with multi-vessels diseases and severed carotid stenosis underwent total coronary revascularization using CABG at the Thong Nhat hospital from 2014-2016. All patients was diagnosed by CAG and or MSCT of carotid artery. On pump CABG for all coronary artery are performed with LITA to LAD and SVG or radian artery to the others. Carotid endarterectomy was carried out after CABG operation.

**Results:** 20 patients with multi vessels disease underwent CABG the average numbers of distal anastomoses and LITA anastomoses per patient were 3.2 respectively. No superficial nor deep sternal infection was observed in this group. 1 patient died by multi-organs falure. 1 patient had stroke, 18 patients underwent CEA after CABG. No AMI appeared during months – 10 years follow-up.

**Conclusions:** Total coronary revascularization by CABG then CEA in patients with multi-vessels diseases and severed carotid stenosis was feasible and safe with satisfactory short-term and long-term results.

### A UNIQUE HYBRID APPROACH TO COMPLEX RE-DO AORTIC ROOT SURGERY

Dr Fiona **Doig**, Dr Peter Tesar, Dr Rishendran Naidoo

*The Prince Charles Hospital, Brisbane, QLD*

**Case Report:** We present the case of a 23-year-old male with recurrent prosthetic valve infective endocarditis who developed ventriculo-aortic dehiscence with a false aneurysm which originated from the left ventricular cavity, wrapped around the true aorta in a retrosternal position and ruptured into the mid-ascending aorta. The surgical management of this complex pathology required a team solution involving anaesthetists, vascular surgery and cardiac surgery. The high risk nature of a fourth time re-do sternotomy and the proximity of the retrosternal false aneurysm in this patient mandated detailed surgical planning and the use of innovative techniques. These included femoral cannulation for cardiopulmonary bypass, percutaneous placement of a transjugular retrograde cardioplegia cannula, insertion of a LV vent via a small left anterior thoracotomy and the use of a CODA balloon, inserted endovascularly from the left brachial artery, for aortic occlusion to arrest and decompress the heart prior to sternotomy. This multidisciplinary approach allowed safe re- entry through the sternum and effective myocardial protection for the replacement of the aortic valve and ascending aorta.

### A RARE MEDIASTINAL MASS: A TERATOMA WITH A CYST

Dr Qaasim **Dollie**, Dr Puneet Prasad, Dr Saad Khan, Dr Brendan Winkle, Dr Paul Clarke, Dr Sylvio Provenzano

*Gold Coast University Hospital, Gold Coast, QLD*

In this abstract we present a rare case study of a multiloculated thymic cyst associated with a mature mediastinal teratoma. The case study is retrospective and encompasses review of clinical, laboratory and radiological findings. A 17 year old male presents with a month long history of severe chest pain. Salient findings include that of a rub over the lower mediastinal border, electrocardiogram showing global PR depression and a raised white cell count. Computerised tomographic scan shows a 10 x 6 x 12 cm heterogenous, predominantly hypodense right prevascular mediastinal soft tissue mass with probable central necrosis. Findings at this time are in keeping with a primary lymphoma or germ cell tumour. A tissue sample is thus required and an urgent right video assisted thoroscopy for biopsy is performed. Cytology is indicative of an acute inflammatory yield and histology showing necrotic tissue, epithelial cells but no abnormal lymphoid cells. Multidisciplinary team discussion concludes that the mass is thus more likely cystic and requires resection. A median sternotomy is thus performed and the mass resected. Margins are not clear due to involvement of the phrenic nerve. Histologically the mass is found to be a multiloculated thymic cyst with an associated mature teratoma present. The teenager recovered well and was discharged home within a week. Dinesh R et al. Multilocular thymic cyst associated with mature mediastinal teratoma: A report of 2 cases. Arch Pathol Lab Med .2004; 128: 227-228.

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## MYCOPLASMA HOMINIS MEDIASTINITIS

Dr Qaasim **Dollie**, Dr Andrie Stroebel, Dr Sylvio Provenzano

*Gold Coast University Hospital, Gold Coast, QLD*

**Purpose:** We present a rare pathogen and atypical presentation with mediastinitis, Mycoplasma Hominis. Post-sternotomy sternal infections are frequently due to gram-positive cocci, especially S. Epidermidis and aureus. M. Hominis is usually associated with genito-urinary infections.

**Methodology:** Retrospective analysis of case data during the perioperative period including laboratory and radiologicial investigations. Furthermore we reviewed current literature on the topic.

**Results:** A 66 year old gentleman had an urgent CABG and represented on Day 10 with sternal pain and shortness of breath. CT chest showed a 3.1 cm pericardial effusion adjacent to the right atrium along with several foci of gas superficial to the manubrium. Re-sternotomy and washed out was performed and M. hominis was cultured from pericardial fluid, retrosternal haematoma and suprasternal collection. He was treated with Flucloxacillin and Doxycycline . A week later his vac dressing was removed and wound closed. He recovered well and remained on antibiotics for 6 weeks.

**Conclusion:** M. hominis is not visualised on gram stains only the presence of neutrophils. Additionally the pathogen is resistant to epiric treatment with B-lactams and vancomyin. This makes targeted antibiotic therapy challenging with concomitant surgical debridement still being the mainstay of treatment. A few case studies have been published and found that M.hominis infections had a high mortality rate with predisposing factors being that of poor cardiorespiratory function and aspiration. One should suspect M. hominis when gram staining reveals no bacteria but large amounts of neutrophils. References Mattila, P. S.et al (1999). Life-Threatening Mycoplasma hominis Mediastinitis. Clinical Infectious Diseases, 29(6), 1529-1537. doi:10.1086/313529

## ROTEM TARGETED FIBRINOGEN TRANSFUSION DURING EMERGENCY REPAIR OF A TYPE A DISSECTING ANEURYSM

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In this abstract we present a case where rotational thromboelastometry (ROTEM) was used to identify specific clotting deficiencies allowing judicious product usage. A 77 year old male presents with Type A dissection from the aortic root extending into all the major arch vessels and descending aorta to superior mesenteric artery. There is associated aortic valve incompetence. Bentalls procedure is thus performed with significant bypass (342 min) and cross clamp time (125 min) and deep hypothermic arrest (17min). Coming off bypass bleeding was ~500mL/min via cardiotomy. Surgical exploration along with traditional methods of packing found no obvious surgically correctable cause to the bleed. The earliest biochemical marker indicative of the coagulopathy on ROTEM was that of a significant decrease in A5 of Fibtem and Extem. Both measure clot firmness 5 minutes after the initiation of clotting and formation of thrombin, influenced by fibrinogen and platelet interaction. With this information a novel but calculated dose of 10g of fibrinogen concentrate was given. The results were evident minutes after administration in that the surgical field was dry without a single further stitch and the patient was able to come off bypass safely. From ED to theatre a total 4 units of packed red blood cells, 3 units of platelets, 1000IU of Prothrombinex and 10g of fibrinogen was given. A further 3 units of packed cells were given over the course of his stay. Using ROTEM we were able to identify specific areas of coagulopathy early on and target our therapy with a novel dose of fibrinogen, ultimately minimising blood product usage and their known adverse effects.

## EARLY AEROBIC EXERCISE AFTER CORONARY ARTERY BYPASS SURGERY: A SYSTEMATIC REVIEW

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**Introduction:** Aerobic exercise (AE) reduces morbidity and mortality for patients following coronary artery bypass graft (CABG) surgery. AE is commonly commenced at least 4 weeks following CABG during outpatient cardiac rehabilitation. AE in the early postoperative period may improve aerobic and functional capacity of patients at hospital discharge. The aim of the present study was to assess the outcomes of early AE following CABG.

**Methods:** A systematic review of the literature was conducted for studies published on outcomes of patients undergoing early (commencing within 2 weeks of CABG) aerobic or functional exercise training. Predefined inclusion criteria included studies reporting on early (<4 weeks) outcomes.

**Results:** Seven studies were identified according to selection criteria. A total of 473 patients received early AE interventions. Functional capacity when measured by 6-minute walk test (6MWT) was higher in early AE groups (mean=404.6m) compared with control groups (mean=378m). Mean ventilatory anaerobic threshold following early AE was 12.15 ml/kg/min and mean peak oxygen uptake was 18.2 ml/kg/min. Early postoperative outcomes included atrial fibrillation (22.9%), deep sternal wound infection (0%) and mortality (0%).

**Discussion:** This study is the only review of early exercise following CABG identified from the current literature. Our results indicate that early AE can be safely performed in selected patients following uncomplicated CABG, with improvements in functional and aerobic capacity in the early postoperative period. Future studies should focus on patient cohorts at higher risk of acute functional or aerobic deconditioning such as the elderly, obese and those with functional limitations from comorbidities.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

### SURGICAL AORTIC VALVE REPLACEMENT IN THE ELDERLY

Dr Mathew **Doyle**, Dr Stewart Moss, Dr Claudia Villanueva, Dr Sheen Peeceeyen, Dr Con Manganas

*St George Public Hospital, Sydney, NSW*

**Background:** Percutaneous aortic valve implantation is increasingly available to elderly patients with aortic stenosis, with potential to reduce hospital length of stay and associated morbidity. We aim to evaluate early clinical outcomes of octogenarians undergoing surgical aortic valve replacement (SAVR) via median sternotomy to determine perioperative risk factors and the impact of surgery on discharge destination.

**Methods:** A retrospective observational study involving 57 consecutive octogenarians who underwent aortic valve surgery between 2011 and 2014. The study assessed pre-operative co-morbidities and post-operative outcomes. EUROSCORE II online calculator was used for risk stratification.

**Results:** The average age of patients was 82.6 years (±2.94). Operations performed included: isolated AVR (41.3%), AVR and Coronary Artery Bypass Grafting (CABG (48.2%) and other surgery with concomitant AVR (10.3%). Average EUROSCORE II was 7.46 (±6.38). Median length of hospital stay was 10 days. Postoperative outcomes included mortality (5.1%), cerebrovascular event (3.4%), permanent pacemaker (6.9%), residual aortic regurgitation (0%) and prolonged ventilation (15.5%). Discharge home was seen in 74.1% of patients, 18.9% required in-hospital rehabilitation and <2% required placement in a nursing care facility.

**Conclusion:** Age alone should not preclude consideration for SAVR in the octogenarian population with acceptable morbidity and mortality rates despite current risk stratification tools suggesting higher mortality. While transcatheter AVR may offer a reduced length of hospital stay, patients can expect to return to their principle place of residence following SAVR.

### DOES SURGICAL TECHNIQUE IN AORTIC VALVE REPLACEMENT SURGERY HAVE AN IMPACT ON RATES OF POST OPERATIVE CONDUCTION DEFECTS REQUIRING PERMANENT PACE MAKER IMPLANTATION

Dr Sam **Emmanuel**, Dr Tamara Ni Hici, Dr Aprim Youhana

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**Background:** Surgical Aortic Valve replacement (SAVR) is a well-established procedure in the treatment of severe aortic stenosis (1). Conduction defects are a known complication of SAVR (2). There is a paucity of data on the effect of suturing technique on incidence for permanent pace-maker (PPM) implantation due to complete heart block. Only one paper could be identified which directly compared the two methods, suggesting an increased rate associated with the continuous suturing technique (2). We investigated the difference in PPM implantation rates in continuous and interrupted suturing techniques.

**Methods:** All patients undergoing SAVR+_ Coronary artery bypass graft (CABG) operations from 05/10/1997 to 30/04/2014 in Morriston Hospital (Swansea, UK) were identified from the cardiothoracic database. Patients with other valve replacement, infective endocarditis or aortic surgery were excluded. This was correlated with a database which showed all PPM procedures performed at the same institution. Patients who underwent either isolated SAVR+-CABG and required a PPM within 90 days of the operation were identified.

**Results:** 2456 operations were performed in the study period. The interrupted suturing technique was used in 62.5% and continuous suturing technique in 37.5% of cases. There was no significant difference in the need for PPM within 90 days between interrupted suturing (2.5%) and continuous suturing techniques (2.7%), p=0.79. There was no difference in mortality, 2.5% in the interrupted group compared to 3.3% continuous group, p=0.31. Cardiopulmonary bypass time was shorter by 16 minutes for the continuous suturing method, p<0.01.

**Conclusion:** In this retrospective single centre cohort study there was no statistically significant difference in the need for PPM implantation within 90 days between the continuous and interrupted suturing methods, similarly there was no difference in mortality, suggesting that either method can be used with similar outcomes in mortality and post-op PPM implantation.

**References:** 1. Nishimura RA, Otto CM, Bonow RO, et al. 2014. AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 63(22):e57-e185. 2. Totaro, P., Calamai, G., Montesi, G., Barzaghi, C. and Vaccari, M. 2000. Continuous Suture Technique and Impairment of the Atrioventricular Conduction After Aortic Valve Replacement. Journal of Cardiac Surgery. 15:418-422.

### OCCULT MALIGNANCY IN INTERNAL MAMMARY LYMPH NODES

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**Purpose:** The clinical value of harvesting of internal mammary lymph nodes found incidentally during internal mammary artery harvest for coronary artery bypass grafting has yet to be defined.

**Methodology:** We present a single-surgeon retrospective review of 164 out of 520 patients where internal mammary lymph nodes were identified during internal mammary artery harvest and subsequently sent for histopathology ± flow cytometry analysis.

## Poster Abstracts (cont'd)

*Alphabetical order by presenting author's surname.*

**Results:** Mean age of patients was 66 ± 10.4 years and 135 patients were male. Maximum lymph node diameter ranged from 2 to 20mm. Occult malignancy was identified in 4 cases: two cases of follicular lymphoma, one case of Non-Hodgkin's lymphoma and one case of mesothelioma. The remaining lymph nodes were identified as reactive or benign normal lymph nodes. There were no cases of injury to the internal mammary artery.

**Conclusion:** Internal mammary lymph nodes identified during conduit harvest should be sent for histopathological analysis. There is a small but clinically important risk of diagnosing occult malignancy in otherwise asymptomatic patients.

### CORONARY ARTERY BYPASS GRAFTING IN A PATIENT WITH DEXTROCARDIA AND SITUS INVERSUS

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*The Prince Charles Hospital, Brisbane, QLD*

Situs Inversus is a rare congenital abnormality affecting approximately 1/10,000 patients where the position of the major organs is reversed. Situs Inversus with Dextrocardia involves malposition of the heart with the cardiac mass lying to the right of the midline with the apex also oriented to the right rather than its usual leftward orientation. This presents a unique challenge when such patients require Coronary Artery Bypass Surgery (CABG) with respect to cannulation technique for cardiopulmonary bypass, choice of graft conduits, graft configuration and where the surgeon stands when operating. A variety of strategies for CABG in patients with Dextrocardia have been described with significant variation in operative strategies reported. We present the case of a 74-year old male with Dextrocardia and Situs Inversus presenting with exertional angina and a positive stress test who was referred for CABG after a coronary angiogram revealed 3-vessel coronary artery disease. After median sternotomy the RIMA was harvested with the surgeon standing to the patients left. The surgeon then changed position to the conventional right side for cannulation for bypass due to their comfort and familiarity with using their right hand for cannulation. Standard aortic and 2-stage venous cannulas were used to establish cardiopulmonary bypass. The Surgeon then completed the operation from the left side of the patient with the RIMA anastomosed to the LAD and Saphenous Vein to the Circumflex and Right Coronary territories. The patient recovered well and at 6 week follow up was pain free without significant complication. This case highlights the flexibility in operative strategy needed for CABG in patients with Dextrocardia and Situs Inversus.

### EXCISION OF A SUB-CORONARY ARTERY PRIMARY CARDIAC PARAGANGLIOMA OF THE RIGHT ATRIOVENTRICULAR GROOVE

Dr William **Foot**, Dr Lawrence Nair, Dr Livia Williams, Dr Peter Tesar

*The Prince Charles Hospital, Brisbane, QLD*

Paragangliomas are neoplasms of neural crest origin arising from extra-adrenal chromaffin tissue. Less than 2% of all paragangliomas are located in the thoracic cavity with primary cardiac paragangliomas especially rare, typically originating from the left atrium. They are usually benign although malignancy can occur, commonly in association with hereditary pheochromocytoma-paraganglioma syndrome. Patients may present with symptoms related to either catecholamine excess or local compression however most are asymptomatic. Given their rarity, surgical experience with cardiac paragangliomas is limited, with simple excision, excision with reconstruction, autotransplantation and even orthotopic heart transplantation described. We present the case of a primary cardiac paraganglioma in an asymptomatic 38-year old male with hereditary pheochromocytoma-paraganglioma syndrome and a family history of fatal malignant paraganglioma. The mass was located in the right atrioventricular groove beneath the right coronary artery (RCA) in juxtaposition with the right atrial appendage. Only three primary cardiac paragangliomas of the right atrioventricular groove have been reported previously. Given his family history, a decision for intervention was made after both the size of the mass on serial imaging and his serum catecholamines were noted to be increasing on follow-up. After median sternotomy, the neoplasm was enucleated with the use of cardiopulmonary bypass and cardioplegic arrest to allow for a still operative field. Multiple feeding vessels between the mass and the RCA were ligated with clips and diathermy. The post-operative course was uneventful with normalisation of his serum catecholamines and discharge day 5 post-operatively

### SURGICAL FIXATION OF TRAUMATIC FLAIL CHEST: AN EARLY EXPERIENCE AT A MAJOR TRAUMA CENTRE

Dr Christine **Goh**, Dr Scott D'Amours, Dr Valerie Malka, Prof Bruce French

*Liverpool Hospital, Liverpool, NSW*

**Purpose:** Traumatic flail chest injury is a potentially life threatening condition. Traditionally flail chests were managed with positive pressure ventilation to provide 'internal splinting' to the thoracic cage as well as improving oxygenation. However a few studies recently suggested that some patients might benefit from early fracture fixation, allowing earlier weaning from mechanical ventilation and reducing respiratory complications. We report our very early experience in surgical fib fixation at Liverpool Hospital.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methodology:** Four patients with traumatic flail chest underwent surgical rib fixation. Early in 2016 we made a decision to internally fix flail chests based on recent evidence and we report the outcomes of our first four patients.

**Results:** The median age was 57 years old. All patients were male. Two had flail chest from motor vehicle accidents, one fell from a horse and 1 fell from ladder. All had New Injury Severity Score of 16. Number of flail segments ranged from 4 to 7. Lung contusion and pneumothorax were present in 2 patients. All patients were operated within 1 week of injury. There was no surgical mortality. Postoperative non-invasive ventilation (NIV) was needed in 2 patients, lasting 10 and 24 hours respectively. Median total length of stay (LOS) in intensive care unit (ICU) was 9.5 days, postoperative ICU stay was 3 days and hospital stay was 15.5 days.

**Conclusion:** No mortality was associated with surgical fixation of fractured ribs. The LOS and the duration of postoperative NIV were satisfactory. As our experience grows we will be reporting more comprehensive and longer-term outcomes.

### PERIPHERAL VASCULAR COMPLICATIONS ARE ASSOCIATED WITH INCREASED MORTALITY IN PATIENTS ON FEMORAL VENOUS ARTERIAL ECMO

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147 patients from January 2008 to August 2015 underwent VA ECMO therapy at a single institution. The mean age of the patient was 49 ± 14 years ( 16 to 85 years) and 64% (n=94) were male. The primary indications for VA-ECMO were primary graft failure post heart transplant (29%), cardiac arrest (22%) and post-cardiotomy shock (19%). Despite 93% of patients having a backflow cannula, 25% still developed distal limb ischaemia leading to compartment syndrome in 10% and amputation in 4%. Age, diabetes and dialysis were strong predictors of distal limb ischaemia. Patients with pre existing peripheral vascular disease were significantly at risk of compartment syndrome (p=0.014) and amputation (p=0.007). 30-day mortality was 50% in patients with compartment syndrome. Peripheral cannulation for VA ECMO can lead to ischaemic complications in significant numbers of patients in cardiogenic shock. Once these complications develop patient outcomes are grim. Patients requiring femoral ECMO must be carefully assessed for vascular complications post insertion. Early intervention is vital with consideration given for alternate sites of cannulation.

### MELIOIDOSIS: A DIAGNOSTIC DILEMMA

Dr Robert **Grant**, Dr Anand Iyer

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**Purpose:** Melioidosis is a disease caused by the gram negative bacteria Burkholderia pseudomallei, which is distributed in soil and surface water in tropical regions of Southest Asia and Northern Australia. Findings in chronic melioidosis include cavitating, nodular or streaky infiltrates mimicking tuberculosis. The clinical features (chronic night sweats, weight loss, fatigue) and radiological findings in melioidosis (mediastinal lymphadenopathy) may mimic underlying malignancy. The gold standard for diagnosis of melioidosis is microscopy and culture. The role of cardiothoracic surgery is to provide tissue diagnosis through mediastinal biopsy, to rule out malignancy, and to therapeutically drain abscesses.

**Methodology:** A retrospective study was performed at the Townsville Hospital of patients treated within the last 5 years who underwent drainage of abscess and/or mediastinal biopsy and subsequent diagnosis of melioidosis by culture.

**Results:** Five patients were diagnosed with melioidosis following thoracic surgery and mediastinal biopsy. Four of these patients were to rule out malignancy and the fifth to rule out tuberculosis. All five patients had diabetes. Four out of five were male and three out of 5 patients were Indigenous. Three patients had thoracotomies, one had VATS and one mediastinoscopy. All five patients have subsequently undergone full treatment for melioidosis with 3 to 6 months of ceftazidime, meropenum or bactrim.

**Conclusion:** Melioidosis often presents with lymphadenopathy, and may mimic both tuberculosis and malignancy. Mortality in the setting of systemic disease is very high. Prompt diagnosis via surgical biopsy and treatment through drainage of abscess is crucial for successful management.

### THE VALUE OF CARDIAC DISSECTION WORKSHOP TO MEDICAL STUDENTS

Dr Robert **Grant**, Professor David Mcgiffin, Dr Robert Tam, Dr Sumit Yadav, Ms Harmanjit Dev, Dr Pankaj Saxena

*The Townsville Hospital, Townsville, QLD*

**Purpose:** Experience in cardiac surgery is usually limited for medical students. There has been a trend in Medical schools in moving away from the traditional method of teaching anatomy by dissection.

**Methodology:** A wet lab was held for cardiothoracic registrars at the Townsville Hospital. Cardiac anatomy was revised through dissection of a pig heart. A bioprosthetic aortic valve replacement was performed on a pig heart with cardiothoracic consultant supervision. This was attended by some Medical students. A subsequent wet lab was held at the Australian Medical Students Association (AMSA)

## Poster Abstracts (cont'd)

*Alphabetical order by presenting author's surname.*

conference in Townsville. Following a presentation on cardiac anatomy, experience was gained in basic surgical skills and dissection of pig hearts. A survey was used to assess student knowledge, surgical skills and career aspirations before and after the lab.

**Results:** Twenty medical students partook in the AMSA wet lab. Medical year ranged from 1st to 6th year, with 85% being in their first two years. Ninety percent of students had not had experience in cardiac surgery and approximately half had not had experience in basic surgical skills. All students reported improvement in knowledge of cardiac anatomy, handling of instruments, knot tying and suturing. There was an emerging trend of increased interest in pursuing a career in surgery.

**Conclusion:** Wet labs are valuable tools for aspiring surgeons at both registrar and medical student level. They provide exposure to cardiac anatomy, dissection skills and advanced surgical skills.

### COMBINED VALVE SPARING AORTIC ROOT SURGERY AND MITRAL VALVE REPAIR

Dr Jonathan **Hartono**, Dr Homayoun Jalali, Dr Lawrence Nair, Dr Yusuke Tsukioka

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** Cardiac manifestations of Marfan Syndrome (MFS) and Ehler-Danlos syndrome include aortic dilatation and mitral valve prolapse. Only scant data exist describing mitral valve prolapse (MVP) in these patients undergoing valve sparing aortic root surgery. Although the majority of patients with Marfan syndrome who undergo elective aortic root replacement have MVP, only a minority have concomitant MV procedures. Mitral valve prolapse is the second most common cardiac manifestation of MFS; with more than 91% of patients with MFS having MVP. Addressing mitral valve disease in patients with MFS who are undergoing aortic root replacement is important because of the anatomic relationship between the two valves and the potential challenge associated with operating on the MV after aortic root replacement.

**Methodology:** We would like to report our limited experience with 5 patients who underwent combined valve sparing aortic root surgery and mitral valve repair.

**Results:** There were no operative mortality or neurological deficits and no valve replacements. One patient required reoperation for pericardectomy and further mitral valve repair after 5 years. Our strategy, technique and results are also discussed.

**Conclusion:** This limited study highlights the feasibility of combined valve sparing aortic root surgery and MV repair in this cohort of patients. However further extensive studies with a larger number of patients are needed to standardise this surgical; technique in subgroup of our population.

### LEFT VENTRICULAR RECONSTRUCTION AND ALFERI STITCH FOR CONCOMITANT APICAL ANEURYSM AND MITRAL REGURGITATION

Dr Jonathan **Hartono**, Dr Matthew Oates, Dr Bruce Thomson

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** LV aneurysm with apical thrombus and mitral regurgitation is an uncommon occurrence. We describe the surgical technique for repair of concomitant LV apical aneurysm and severe MR in a 62-year-old man presenting with symptomatic chest pain from a delayed presentation anterolateral STEMI.

**Methodology:** Cardiac MRI of the patient revealed a LV anteroapical aneurysm with a large thrombus. TTE revealed LVEF of 21% and severe MR related to posterior leaflet restriction. The patient was medically optimised for 6 weeks also allowing for maturation of infarct-related scar tissue. Median sternotomy was performed and the patient placed on CPB. Aorto-SVG grafts were constructed to D1 and OM1. The LV aneurysmotomy, thrombectomy and severance of secondary chordae to the posterior leaflet were performed under direct vision. Alferi stitch was then placed between A2 & P2. LV was reconstructed with Fontan stitch and bovine pericardial patch implanted separating the scar from myocardium. The aneurismal sac was then closed over the repair with Teflon buttressing added for integrity.

**Result:** Patient had an uneventful postoperative recovery during which IABP removal, dopamine weaning & neurohormonal antagonist therapy occurred. Pre-discharge echo showed a LVEF of 37% with trivial MR, a transmitral gradient of 3 mmHg & an ellipsoid LV. The patient was NYHA I & CCS 0 at his 6 week review.

**Conclusion:** We report the surgical case of LV reconstruction concomitant with transventricular mitral repair & CABG with an encouraging early outcome. In the absence of robust evidence to guide the surgical therapies in patients with severe heart failure, a tailored approach to the individual patient's specific pathology is cogent.

### FIBRINOGEN CONCENTRATE DOSING IN COMPLEX CARDIAC SURGERY

Dr Cheng **He**, Ms Bronwyn Pearse, Dr Peter Tesar, Dr Daniel Faulke

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**Purpose:** Allogenic blood products are often used during complex cardiac surgery. Fibrinogen concentrate (RiaSTAP, CSL Behring) may more rapidly and reliably correct fibrinogen deficiency, minimising immunological, infectious and circulatory complications of FFP and cryoprecipitate. However, optimal dosing remains unclear. We describe the use of an 'ideal body weight' (IBW) fibrinogen concentrate dosing regimen, resulting in reliable achievement of target coagulation values.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methodology:** Between November 2015 and May 2016, fibrinogen concentrate was used, on a select basis, in twenty-one patients who underwent an array of complex cardiac surgeries, including heart/lung transplantation, reoperative aortic surgery and aortic dissection. ECMO and percutaneous VAD patients were excluded. Intraoperative ROTEM® (TEM International, Germany) FIBTEM (fibrin-based thromboelastometry testing) was measured pre- and post- administration of fibrinogen concentrate, with an A10 trigger for administration of ≤9 mm and a target of 17 mm. Dosing was based on an IBW formula; fibrinogen concentrate (grams) = (Target FIBTEM (17mm) – Actual FIBTEM) x IBW / 140. A maximum of two doses was used per patient.

**Results:** The median FIBTEM A10 trigger for fibrinogen concentrate use was 7 mm (IQR: 4-7 mm) whilst the median dose used was 5 g (IQR: 3-6 g). Following administration, the FIBTEM A10 normalised to a median of 18 mm (IQR: 15-19 mm).

**Conclusion:** Our initial experience demonstrates the feasibility of an 'ideal body weight' based fibrinogen concentrate dosing protocol, which reliably achieved target FIBTEM A10 values.

### CURRENT RESULTS FOR ECMO POST CARDIAC SURGERY – MINIMISING MORBIDITY, IMPROVING OUTCOMES

Mr Jiahua **Huang**, Dr Mark Connellan, Dr Emily Granger, Dr Kumud Dhital

*St Vincent Hospital, Sydney, NSW*

**Introduction:** Cardiac surgical patients in cardiogenic shock may require Extra Corporeal Membrane Oxygenation (ECMO) support. This is "traditionally" associated with poor survival and increased morbidity. This study reviews the short-term outcomes for ECMO usage in this challenging group.

**Methodology:** 41 patients received postoperative VA-ECMO from January 2008 to August 2015 at St Vincent Hospital. Only patients undergoing conventional cardiac surgery were analysed. Cardiac transplantation and ventricular assist device surgery was excluded. Mean age was 55.4 ± 15.1 years, 78% were male. The operations included coronary artery bypass grafting, valvular surgeries, aortic dissection repair, left ventricular aneurysm repair, aortic root surgeries and cardiac myomectomy. For 6 patients VA-ECMO was initiated pre-operatively, 28 patients received intraoperative ECMO and 7 patients had to undergo ECMO in the early postoperative period. ECMO was placed peripherally (femoral) in 35 patients and centrally in 6 patients.

**Results:** 28 (68.3%) patients were successfully weaned off ECMO and 20 (48.8%) patients survived to hospital discharge. The average duration of support was 6.3±4.3 days and the average length of postoperative stay was 30.5±28.0 days. 51.2% of the patients had post-operative renal failure requiring haemodialysis, 41.5% underwent rethoracotomy for bleeding and 14.6% had lower limb ischaemia. Factors associated with increased mortality included longer ICU and hospital stay, and poorer LV function.

**Conclusion:** Early institution of ECMO can minimise post operative morbidity and improve outcomes. In this study patients were highly selected, however results suggest that ECMO can be used to assist recovery from complex surgery in high risk patients with good outcomes.

### POST CARDIOTOMY VA ECMO CURRENT RESULTS FOR VENOUS ARTERIAL ECMO POST CARDIAC SURGERY – IMPACT ON MEDIASTINAL HAEMOSTASIS AND TRANSFUSION REQUIREMENTS

Mr Jiahua **Huang**, Dr Mark Connellan, Dr Emily Granger, Dr Kumud Dhital

*St Vincent Hospital, Sydney, NSW*

**Introduction:** Post-cardiotomy cardiogenic shock requiring VA ECMO is associated with a high risk of bleeding from operative sites. Control of this bleeding with aggressive transfusion of blood products and adjuncts must be balanced with the risk of clotting off the ECMO circuit. This retrospective review analyses the bleeding complications and transfusion requirements of patients placed on VA-ECMO post cardiac surgery.

**Methodology:** 91 patients received postoperative VA-ECMO from January 2008 to August 2015 at St Vincent Hospital. The most common surgeries were heart transplantation (55%), coronary artery bypass grafting (CABG) and valvular surgery (16%), isolated CABG (9%), valvular surgery (11%) and other forms of cardiac surgery (major aortic/PTE/myomectomy) (9%). VA-ECMO patients were supported for an average of 5.4±3.5 days. 63 (69.2%) patients were male and mean age was 51.9±14.1 years. 25 (27.5%) patients involved redo sternotomy. Mean cardiopulmonary bypass time and cross-clamp time were 234.9±101.4 minutes and 112.9±73.1 minutes. Peripheral cannulation was performed in 86% of patients.

**Results:** Rethoracotomy for bleeding was required in 47.3% of patients. Products transfused during the first 48 hours included: red blood cells 12.8±10.4 units, fresh frozen plasma 8.9±8.6 units, cryoprecipitate 10.6±9.7 units and platelets 3.8±3.0 units. Patients with gross mediastinal bleeding needing take back to theatre for haemostasis had a longer ICU stay and higher rate of wound infections. Fortunately increased transfusion requirements did not lead to increased thromboembolic complications. Mortality for patients taken back to theatre for bleeding was 46.5%. Renal failure requiring haemofiltration was not significantly higher in the bleeding groups.

**Conclusion:** VA-ECMO post cardiac surgery undoubtedly increases bleeding. Patients enter a spiral of coagulopathy and despite aggressive blood product transfusion and meticulous surgical technique, may still need to return







to theatre. Strategies such as mediastinal packing and haemostatic adjuncts can facilitate better haemostasis. The circulatory support may keep the patient alive, but unfortunately often at a bloody cost.

## CT PULMONARY ANGIOGRAPHY AFTER DISCHARGE FOLLOWING CORONARY ARTERY BYPASS GRAFTING: CONTEMPORARY EVIDENCE TO ASSIST SERVICE RATIONALISATION

Dr Katherine **Hulme**

*Waikato Hospital, Hamilton, New Zealand*

CT pulmonary angiography (CTPA) is an investigation with well-proven accuracy in the diagnosis of pulmonary embolism (PE). But with the significant radiation dose and the ever-present limitation of resources, CTPA should only be done in patients with a reasonable chance of finding PE. The risk of PE is known to be low after coronary artery bypass grafting (CABG) but evidence for rationalization of CTPA in a contemporary NZ setting is lacking. A retrospective audit of patients who underwent CTPA at Waikato Hospital after discharge from CABG within the first 30 days of surgery between May 2008 and May 2016. Data collected included basic epidemiology, CT specific information on referral source, indications and findings, and outcomes for each patient. 2430 patients underwent CABG in this eight-year period. 22 patients had CTPA after discharge within 30 days of surgery. The average age was 64 years and 58% were male. CTPA were most commonly requested by cardiology and cardiothoracic surgery (CTS) services for chest pain and shortness of breath. D-dimer and arterial blood gases were done pre-CTPA in less than a third of patients. One patient had PE. Many scans identified clinically significant sized pleural effusions and none found an alternate cause for pain. When compared to other specialties, CTS is a small user of CTPA but improvements in rationalization of this resource seem possible. When an alternate cause of presenting symptoms is more likely, then CTPA is difficult to justify as the chance of diagnosing PE is highly unlikely.

## INOPERABLE INFECTED AORTIC GRAFTS: A CASE, A CHASE AND A LITERATURE TRACE

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*Waikato Hospital, Hamilton, New Zealand*

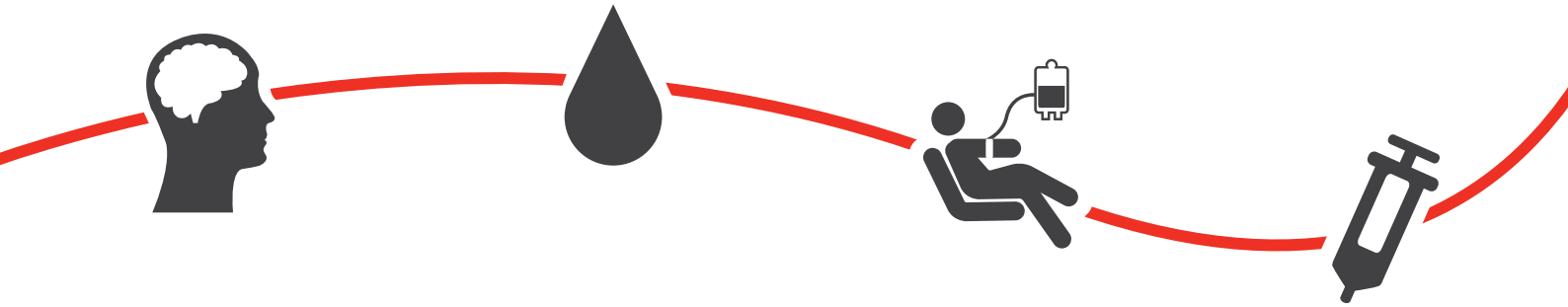
A 33-year-old man presented with RUQ abdominal pain and fevers. The man was well known to the hospital with end-stage renal failure requiring haemodialysis, and multiple admissions for medical and surgical pathology, including DeBakey type II aortic dissection 8 months earlier treated with straight-forward hemiarch replacement. CT imaging showed a marked peri-aortic collection involving the previous repair. It also showed bilateral likely infective multiple pulmonary emboli, as well as splenic infarcts. Ultrasound-guided aspiration grew non-multiresistant MRSA. Aspiration was done on a Friday and over that weekend unfortunately the patient suffered from a sudden deterioration in GCS and left-sided weakness, assumed to be embolic stroke. He was reviewed independently by two senior surgeons on the Monday, both who decided that the risk of surgery to replace the infected graft and the chance of reinfection was extremely high, and therefore declined to operate. While planning discharge, the patient asked for his likely prognosis. With no personal experience, the various sources available were consulted. Cardiothoracic and vascular surgery surgeons and departments, clinical coding, hospital pharmacy, ACC and the infectious diseases department, all could recollect individual cases but infrequently accurate details, and certainly no registry. The most fruitful was the long-serving cardiothoracic ward charge nurse, who remembered three similar cases. Literature search was undertaken but once again found limited data. In conclusion it seemed that if the microbiology was favourable then stabilization of infection can lead to months to years of lifespan, and currently the patient is still living at 3 months since discharge.

## PEARS VS STANDARD AORTIC ROOT SURGERY: FINANCIAL AND CLINICAL OUTCOME COMPARISONS

Dr Katherine **Hulme**, Mr Nick Odom, Ms Kate Owens, Mr Adam El Gamel

*Waikato Hospital, Hamilton, New Zealand*

Personalised External Aortic Root Support (PEARS) is an alternative to aortic root replacement. It is valve and tissue-sparing, and was initially aimed at patients with Marfan Syndrome. The first four cases in the Southern hemisphere were successfully completed at Waikato Hospital in April 2016. For further cases to be approved by hospital management, an assessment of financial and clinical outcomes compared to established operations was required, in part due to the high cost of producing the individualized prosthesis. The four patients who underwent PEARS were compared to similar patients. The comparative group included all patients who underwent elective aortic root replacement in the past five years. Other criteria included being aged 50 years or younger, and aneurysm as an indication for surgery (not infection or dissection). Data collected included basic patient epidemiology, theatre, critical care and hospital time and resources involved, complications and follow-up. Twelve patients were identified from theatre records that fulfilled criteria for comparison to PEARS, 3 valve-sparing root replacements and 9 total root replacements. Main financial differences favouring PEARS were seen in theatre time, blood product usage, and critical care and hospital length of stay. These were reflected by the cost-weight calculation for the admission. Two additional patients were analysed to show the costs associated with a complicated recovery and discuss potential future direction for the technique. PEARS offers financial and clinical outcome advantages compared to established operations despite the high up-front cost of the individualized prosthesis.



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Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

## THERE WILL BE BLOOD: A 5 YEAR REVIEW OF TRANSFUSIONS ASSOCIATED WITH CABGS AND SINGLE VALVE REPAIRS AT A TERTIARY CARDIAC CENTRE, AND THEIR IMPACT OF PATIENT HOSPITAL LENGTH OF STAY

Mr Damian **Ianno**, Ms Kelly Mirowska-Allen, Dr Stephen Kunz, Mr Siven Seevanayagam

*Austin Hospital, Melbourne, VIC*

**Purpose:** Cardiac surgery as a discipline carries some of the highest use of blood products. While appropriate use of these can be vital to the care of patients, it is not without considerable risk, including an increased length of stay (LoS). We sought to examine the impact red blood cell (RBC) transfusion had on this variable at our institution, and whether it was modified by their type of surgery, and if this magnitude correlated with the volume of units used.

**Methodology:** We conducted a retrospective observational study at a single tertiary cardiac unit, reviewing all patients between January 2011 to December 2015 who had an on-pump CABGs or single valve repair/replacement. In addition to the number of units administered, additional variables were collected to allow for risk stratification. The primary outcome measurement was LoS.

**Results:** Of the 795 identified, 332 (41.8%) received a RBC transfusion, with a total of 1035 units transfused. Univariate analysis yielded a 44% longer LoS (IRR: 1.44; 95% CI 1.35-1.55; $p<0.0001$) in individuals who received a transfusion. This remained significant on multivariate analysis (IRR: 1.40; 95% CI 1.25-1.51; $p<0.0001$). For patients who received a RBC transfusion, on multivariate analysis every additional RBC unit given was associated with a 10% longer LoS (IRR: 1.10; 95% CI 1.07-1.13; $p<0.0001$).

**Conclusion:** Patients who received a RBC transfusion at our institution had a 40% longer LoS, with a 10% increase for every unit transfused. While patients who receive a transfusion may represent a more unwell population, correcting for this within our population suggests that there is a direct impact of RBC transfusion on patient outcomes.

## BULLET PROOF – PREVIOUS CORONARY ARTERY SURGERY PREVENTING TAMPONADE IN A GUN SHOT WOUND TO THE CHEST

Dr Charles **Jenkinson**, Dr Ashu Gupta, Professor Mohammed Balal

*Fiona Stanley Hospital, WA*

**Purpose:** We present the case and pertinent radiology of a 74 year old male with a history of coronary artery bypass grafting who sustained a self-inflicted gun shot wound to his anterior chest from a 0.22 calibre rifle loaded with bird shot. The injury was sustained several hours prior to presentation, with no adverse hemodynamics. CT scan demonstrated multiple pellets related to the antero-inferior aspect of the right ventricle, and a pseudoaneurysm, likely contained by pericardial adhesions from previous surgery. Hepatic segments 2 and 3 were lacerated, and there were pellets surrounding the descending aorta. He underwent laparotomy and wedge resection of segments 2 and 3 of the liver and repair of the diaphragm, however the injury to the right ventricle was managed conservatively. The patient was referred to a psychiatric service following an uneventful admission.

**Conclusion:** We believe that intrapericardial adhesions from previous cardiac surgery prevented this patient from developing a large volume hemopericardium, tamponade, and perhaps death. Of course, had a larger bullet size or calibre entered his chest, he would have been unlikely to survive.

## ASSOCIATION OF AORTIC BRANCHING VARIATIONS AND TYPE A AORTIC DISSECTION

Dr Charles **Jenkinson**, Dr Rhys Powell, Dr Ashu Gupta

*Fiona Stanley Hospital, WA*

**Purpose:** Type A Aortic Dissection is a life-threatening condition that needs prompt surgical intervention for survival. Despite optimal and timely therapy, morbidity and mortality remain common. We examine the Western Australian experience with Type A Aortic Dissection, specifically looking for incidental findings of abnormal aortic branching.

**Methodology:** Patients with Type A Aortic Dissection were identified from prospectively collected data at Royal Perth Hospital, Fremantle Hospital, and Fiona Stanley Hospital. Baseline characteristics and outcomes were collected, and axial imaging was reviewed by a Consultant Radiologist with a special interest in thoracic imaging. Variant branching patterns were noted, and recorded in a Microsoft Excel spreadsheet. To determine the baseline incidence of branching variations, CT scans performed for any reason (excluding aortic dissection) were catalogued by the same Consultant Radiologist. Statistical analysis was then undertaken using GraphPad Prism version 7.0a for OSX, GraphPad Software, La Jolla California USA.

**Results:** We identified 40 acute Type A Aortic Dissections. There were six deaths (15%), 8 readmissions (20%), and twenty-two patients (55%) had a documented history of hypertension, and 8 (20%) reached theatre in a haemodynamically compromised state.

**Conclusion:** To our knowledge, this is the first time that a comparative study of arch variation has been undertaken in the setting of aortic dissection. We look forward to sharing our results.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

### FACTORS DETERMINING POST-OPERATIVE ACUTE KIDNEY INJURY FOLLOWING CARDIAC SURGERY

Dr Charles **Jenkinson**, Dr Els Van Laeken, Dr Bijit Munshi, Dr Warren Pavey, Mr Brian Wright, Mr Robert Larbalestier

*Fiona Stanley Hospital, WA*

**Purpose:** Acute kidney injury is a recognised complication following cardiac surgery. Though the aetiologies, and risk factors are widespread, it can be associated with increased morbidity, mortality, and length of stay.

**Methodology:** A retrospective review of prospectively collected data from Royal Perth Hospital and Fiona Stanley Hospital in Perth, Western Australia, over the previous five years identified all patients who sustained an acute kidney injury following cardiac surgery. Patients with preoperative dialysis or working kidney transplant were excluded.

**Results:** Of 1,554 patients identified, 205 (13.2%) suffered an acute kidney injury. They tended to be older (64.21 ± 0.98 vs 60.37 ± 0.41 years, p = 0.0005), more likely to be diabetic (17.1% vs 11.4%, p = 0.002), and more likely receiving surgery for endocarditis (27.2% vs 13.7%, p = 0.002). Blood transfusion was also associated with a higher incidence (61.2% vs 38.1%, p < 0.001). There was no difference in the incidence of renal failure in Aboriginal patients (10.98% vs 13.45%, p = 0.46), nor male gender (71.2% vs 71.7%, p = 0.89). Preoperative creatinine was also surprisingly not associated (115.8 ± 4.22 vs 106.4 ± 3.08, p = 0.25). There was significantly higher 30 day mortality in the cohort with acute kidney injury (12.2% vs 1.48%, p < 0.001).

**Conclusion:** We have identified several preoperative characteristics for the development of acute kidney injury following cardiac surgery. We also discuss intraoperative factors, including fluid management, and drug administration.

### OUTCOMES AFTER CARDIAC SURGERY IN PATIENTS WITH PREOPERATIVE DIALYSIS

Dr Charles **Jenkinson**, Dr Suanne Macconnell, Dr Lakshmeesh Shetty, Mr Robert Larbalestier

*Fiona Stanley Hospital, WA*

**Purpose:** Haemodialysis or Peritoneal Dialysis as a form of Renal Replacement Therapy (RRT) for chronic renal failure is a life-sustaining therapy which is common in our practice. The median survival of patients undergoing RRT in Australia is only 2.1 to 6.6 years (depending on age), and 29.8% of patients die of cardiovascular disease [1]. This situation is even more dire in our Indigenous population [2].

**Methodology:** A retrospective review of prospective data collected from Royal Perth Hospital and Fiona Stanley Hospital in Perth, Western Australia over the previous five years. Patients were selected on the basis of preoperative RRT, excluding kidney transplantation. Fisher's Exact and Student-t tests were used on baseline characteristics and post-operative complications as applicable.

**Results:** 43 of 1,567 patients (2.74%) of patients operated in this period were dialysed preoperatively. Three of these patients had previously received kidney transplants, compared to 8 in the non-dialysis group. The average age of the dialysed group was 59.05 ± 1.51, compared to 60.96 ± 0.39 (p = 0.0008). Indigenous patients were overrepresented (32.6% vs 9.90%, p < 0.001). Thirty day mortality was higher in the dialysis group (14.0% vs 3.03%, p = 0.002).

**Conclusion:** Preoperative haemodialysis is associated with worse outcomes after cardiac surgery.

**References:** ANZDATA Registry. 38th Report, Chapter 3: Mortality in End Stage Kidney Disease. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2016. Kidney disease in Aboriginal Australians: a perspective from theNorthern Territory. (2014). Kidney disease in Aboriginal Australians: a perspective from theNorthern Territory, 1–7.

### CARDIOTHORACIC SURGERY PATIENTS REQUIRING MASSIVE TRANSFUSION: INITIAL DATA FROM THE AUSTRALIAN AND NEW ZEALAND MASSIVE TRANSFUSION REGISTRY (ANZ-MTR)

Dr John Oldroyd, A/Prof Robert Baker, Dr Scott **Jennings**, Dr Zoe Mcquilten, Dr Rasa Ruseckaite, Dr Roman Kluger, Dr Lavinia Tran, A/Prof Erica Wood

*Transfusion Research Unit, Melbourne, VIC*

**Purpose:** To characterise cardiothoracic (CT) surgery patients requiring massive transfusion (MT) (≥5 units red blood cells (RBCs) in 4h) in the ANZ-MTR.

**Methodology:** The ANZ-MTR uses electronically stored data from hospital information systems. All consecutive CT surgery patients who received a MT between Apr 2011 – Sept 2015 at 22 hospitals were included. Survival to hospital discharge was obtained from hospital records. Overall mortality post-discharge was obtained from linkage to the National Death Index.

**Results:** Of 4379 MTR patients, 861 (19.7%) underwent CT surgery; 664 (77.1%) cardiac, 169 (19.6%) thoracic vascular and 28 (3.3%) lung procedures. 442 (66.6%) of cardiac procedures were male with median [interquartile range] age 69 [59-77] years compared to 2680 (61.2%) males aged 63 [47-74] years in the MTR cohort. In cardiac procedures, total fresh frozen plasma: red blood cell ratio (FFP: RBC) for the episode of care was 0.6 [0.4-0.8] compared with 0.5 [0.3-0.8] the MTR cohort. 18.3% of cardiac procedures received prothrombinex compared with 11.0% in the MTR cohort. 461 (75.1%) cardiac patients survived to discharge compared with 72.7% of the MTR cohort. Overall cardiac patient survival post-discharge was 71.8% compared with 68.5% in the MTR cohort.

Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Conclusion:** Critically bleeding CT surgery patients in Australia and New Zealand comprise a large proportion of patients requiring MT. Future studies are needed to examine the optimal ratio of blood components (e.g. FFP: RBC) and other patient, procedural and transfusion factors which may influence outcomes in these patients.

## INDIGENOUS AUSTRALIAN CARDIAC SURGERY MORBIDITY COMPARISONS

Dr Scott **Jennings**, Dr Greg Rice, Dr David Lance, Dr Hugh Cullen, A/Prof Robert Baker, A/Prof Jayme Bennetts

*Flinders Medical Centre, Adelaide, SA*

**Purpose:** Indigenous Australians typically present at a much younger age for cardiac surgery compared to non-indigenous patients. Despite this, Indigenous patients carry a substantial burden of comorbidities. These patients also face significant barriers to the access of healthcare from logistical, social, financial and cultural perspectives. A detailed analysis of pre-, intra- and post-operative characteristics was conducted.

**Methodology:** A retrospective case audit was performed identifying 3769 cases from 1/1/2006 to 30/6/2015 Univariate analysis performed on pre-, intra- and post-operative variables and outcomes. All statistical analysis was performed using SPSS Ver. 23. Significance was set at $p = 0.05$.

**Results:** 575 cases identified as Indigenous. 19 significant pre-operative differences were: AusSCORE predicted mortality, age, BMI, serum creatinine, hypertension, smoking, substance abuse, MI within the previous 90 days, diabetes, peripheral vascular, renal disease, dialysis dependence, pulmonary hypertension, family history of cardiac disease, redo surgery, active endocarditis, urgent surgery, rheumatic heart disease and intra-aortic balloon pump use. Intra-operative differences were not significant except for a higher proportion of Indigenous patients presenting for valve only surgery. Post-operatively, Indigenous patients had significantly higher rates of dialysis. However, deep sternal wound infection rate, post-operative length of stay and rate of re-admission within 30-days were not significantly different between the groups.

**Conclusion:** This single centre review of Indigenous cardiac surgery patients has demonstrated a greater burden of pre-operative comorbidities compared with that of Non-indigenous patients. However, as outcomes for Indigenous and non-indigenous patients were not largely dissimilar, it highlights both the quality of inpatient care but also the continued need for initiatives like Closing the Gap. Closing the Gap aims to further reduce this initial disadvantage that Indigenous patients present with by a continued focus on preventative and primary health goals. This study shows that continued support for these initiatives is still as important as when initially implemented.

## RADIAL ARTERY VS. SAPHENOUS VEIN GRAFT FOR CORONARY ARTERY BYPASS SURGERY: A SYSTEMATIC REVIEW OF THE LITERATURE

Dr Alireza **Kashani**, Dr Satya Shanbhag, Mr Nicholas Kang, Mr David Haydock, Mr Indran Ramanathan

*Cardiothoracic Unit, Auckland City Hospital, Auckland, New Zealand*

**Purpose:** In coronary artery bypass surgery (CABG) apart from left internal mammary artery (LIMA) the commonly used conduits are the saphenous vein (SVG) and radial artery (RA). The long term patency of LIMA is well known, however long term patency of SVG and RA is not yet fully established. The present systemic review aims to critically analyse long term patency of SVG and RA in patients undergoing conventional CABG surgery.

**Methodology:** A total of eight randomised studies (RCT's) were selected by utilising electronic database from Medline, Embase, Cochrane, Scopus and Pubmed. Only RCT's using SVG and RA and reporting angiographic comparsons were included in the study.

**Results:** Eight trials with 1885 participants (1445 RA and 1412 SVG) provided the data for analysis. The RA group was associated with significantly lower incidence of graft failure compared to SVG group ($p < 0.0001$). The RA group also required significantly less repeat coronary intervention ($p < 0.02$). The quality of evidence for these studies as analysed by GRADE method were average to moderate level for the different variables.

**Conclusion:** The results from the present study indicate significant long term patency and decreased re-intervention rate with RA compared to SVG group. However further study is required to definitively establish this association in different subset of patients and different coronary artery territories.

## A CASE OF MALIGNANT PERICARDIAL TAMPONADE IN A TRAUMA PATIENT

Dr Saad **Khan**, Dr Qaasim Dollie, Dr Andrie Steoebel, A/Prof Martin Wullschelger

*Gold Coast University Hospital, Gold Coast, QLD*

Malignant pericardial involvement is detected in 1-20% of autopsies in cancer patients (1). Malignancy tends to be the most common cause of haemorrhagic pericardial effusions in areas with low incidence of TB (2). This case study discusses an interesting scenario of a malignant pericardial effusion discovered in a trauma patient. 58M presents following a MVA after side-swiping two other vehicles having airbags deployed. The patient was transferred to a tertiary hospital after self extricating at the scene and subsequently collapsing with paramedics in attendance. Trauma scan suggestive of large pericardial effusion with linear hyperdensity arising from descending aorta near ductus diverticulum, suspiscious for contrast jet, however, no intimal flap demonstrated.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

Further angiogram of aortic arch revealed no obvious bleeding. On table decision made for pericardiocentesis revealing frank flood and further angiogram demonstrated no arterial bleeding. Of note, echocardiogram one month prior for MSSA bacteraemia demonstrated no pericardial effusion or vegetations. Pt had a background history of recurrent melanoma with disease resections in 1984 and 2002. Cytology revealed atypical cells consistent with metastatic melanoma. Patient went on for further surgical intervention with a pericardial window.

### HIGH-RISK CARDIAC SURGERY IN AN AUSTRALIAN POPULATION IS BETTER DEFINED BY THE STS SCORE AND EUROSCORE II THAN THE AUSSCORE

Mr Shanq Kuen **Koo**, Conjoint Associate Professor Rebecca Dignan, Mr Corey Williams

*The University of New South Wales, Liverpool Hospital, Liverpoool, NSW*

**Introduction:** Risk scoring models (RSM) are commonly implemented to estimate the postoperative mortality risk of cardiac surgery patients. Studies have reported inaccurate mortality prediction by the RSM. Furthermore, the discrimination and calibration of the RSM to the Australian population remains unknown.

**Methods:** The study population included cardiac surgery patients operated at Liverpool Hospital between January 20 13 and December 2014. Patient's demographics were routinely collected and entered into a prospective database. Mortality risks were estimated using the Additive EuroSCORE (AS), Logistic EuroSCORE (LES), EuroSCORE II (ES2), Society of Thoracic Surgeon Score (STS), AusSCORE total score (AS) and AusSCORE Multirisk (ASMR). Discrimination and calibration of the RSM was evaluated to determine the prediction accuracy to the population. High-risk cut-off points for ES2 and STS were derived using Youden's J statistics.

**Results:** Overall, 738 surgical patients were used for the RSM analysis. Observed mortality of the population was 3.78%. ES2 has the best discrimination and acceptable calibration (AUC=0.850; p=0.053) while STS has good discrimination and calibration (AUC=0.806; p=0.652). AES, LES, ES2 and AS over-predicted while the ASMR and STS under-predicted mortality. Estimated mortality of ES2 was closest to observed mortality (Observed to expected ratio= 0.909). High-risk cut-off point for ES2 and STS are 3.00% and 1.705% respectively.

**Conclusion:** The final decision regarding the benefits and risks of surgery should be based on clinical judgment and the Heart Team recommendation. RSM should be used as a guide for identification of high-risk patients. Calibration of RSM to the population is essential prior to use.

### BAD BLOOD – A 5 YEAR REVIEW OF TRANSFUSIONS ASSOCIATED WITH CABGS AND SINGLE VALVE REPAIRS AT A TERTIARY CARDIAC CENTRE, AND THEIR COMPLIANCE WITH NATIONAL GUIDELINES

Dr Stephen **Kunz**, Ms Kelly Mirowska-Allen, Mr Damian Ianno, Mr Siven Seevanayagam

*Austin Hospital, Melbourne, VIC*

**Purpose:** Cardiac surgery consumes more blood components than most other disciplines. Appropriate product prescribing remains at the forefront of national standards on safety and quality, and inappropriate transfusion can be associated with deleterious effects and opportunity cost. Following a perceived spike in our use of PRBCs, we examined our hospital's transfusion behaviour over the past 5 years of cardiac surgery.

**Methodology:** A case-control study was undertaken at the a single tertiary cardiac centre, reviewing all CABGs and single valve repair/replacements from 2011 to 2015, identifying each transfusion trigger, initiating team, the corresponding haemoglobin, length of stay (LoS), transfusion reactions, and consistency with national guidelines.

**Results:** 401 patients received a PRBC transfusion, with 842 triggers identified, corresponding to 1259 units. Of these, 40.50% of triggers (341), or 398 units, were inconsistent with the relevant guidelines. The most common teams instituting inconsistent transfusion were ICU (46.73%), anaesthetics (29.15%), perfusionists (14.82%) and cardiac surgery (8.04%). Indications given were anaemia (34.31%), bleeding (19.65%) and hypotension (11.14%). Remarkably 31.67% had no documented trigger. Adverse events from these included 15 febrile non-haemolytic reactions, and a 13.8% increased LoS (p=0.03).

**Conclusion:** Despite extensive literature about the deleterious effects of PRBC transfusion and haemovigilance strategies, behaviours surrounding their use remain haphazard, with significant clinical impost. Our data also suggests that it is transfusion itself rather than the associated acuity that prolongs LoS. Unit specific education beyond that of cardiac surgery is required to rectify this.

### FIRST BLOOD: THE UTILITY OF THE INITIAL HAEMOGLOBIN IN ICU IN PREDICTING THE LIKELIHOOD OF POST-OPERATIVE TRANSFUSIONS, OVER 5 YEARS OF CARDIAC SURGERY

Dr Stephen **Kunz**, Ms Kelly Mirowska-Allen, Mr Damian Ianno, Mr Siven Seevanayagam

*Austin Health, Melbourne, VIC*

**Purpose:** Red blood cells (RBCs) are a finite resource. While cardiac surgery is associated with a higher use of blood products than other disciplines, the ability to predict the need for RBCs would aid in efficient resource management.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

We examined the utility of the initial haemoglobin in ICU and its association with the likelihood of transfusion, along with the number of units transfused.

**Methodology:** A case-control study was undertaken at a single tertiary institution, reviewing all cases of CABGs and single valve repair/replacements between January 2011 and December 2015. Their first haemoglobin on blood gas in ICU was measured and stratified into groups (<80g/L being low, 81-100 being normal, 101-120 being high and >120 being very high), as was whether they received a RBC transfusion following this and, if so, the total number of units administered.

**Results:** Of 912 patients identified, 6 were excluded due to being in trials that influenced transfusion behaviour. For those that remained, 111 were within the low haemoglobin group (12%), 430 within the normal (48%), 288 within the high (32%) and 120 within the very high (8%). Compared with the normal group, those with a low Hb were 425% more likely to receive an RBC transfusion (OR 4.24; 95%CI 2.63-6.86, p=0.000), and require 71% more units (IRR 1.71, p=0.000). While those in the high and very high groups were less likely to receive a transfusion (OR 0.18; 95%CI 0.12-0.28, & OR 0.017; 95% CI 0.00-0.13, p=0.000) this did not translate to a decrease in the number of units transfused (IRR 0.94 & 0.99, p=0.72 & 0.99)

**Conclusion:** A lower haemoglobin on arrival to ICU following cardiac surgery is correlated with a greater risk of transfusion, and greater number of units required. This may aid in developing a future algorithm in predicting requirements for blood.

### PUMPING IRON – THE IMPACT OF PRE-OPERATIVE IRON TRANSFUSIONS ON RBC USE IN A TERTIARY CENTRE OVER 5 YEARS

Dr Stephen **Kunz**, Mr Damian Ianno,
Ms Kelly Mirowska-Allen, Mr Siven Seevanayagam

*Austin Hospital, Melbourne, VIC*

**Purpose:** Given the association between red blood cell (RBC) transfusion and adverse outcomes, many hospitals have instituted pre-operative iron administration in those found to have iron-deficient anaemia, despite paucity within the literature on its effects on RBC transfusion. We elected to examine our experience with the pre-operative iron transfusion and post-operative RBC transfusion within cardiac surgery over the past 5 years.

**Methodology:** A case-control study was undertaken at a single tertiary hospital, reviewing on-pump CABGs and single valve repair/replacements from January 2011 to December 2015. In addition to iron transfusion, data on age, sex, Euroscore and pre-op haemoglobin were collected to control for potential confounders. Outcomes were RBC transfusion and volume of units transfused.

**Results:** Of 912 patients identified, 6 were excluded due to being enrolled within trials that altered transfusion behaviour. Thirty-one received a pre-operative iron transfusion, and 393 received a RBC transfusion, with a total of 1242 units being used. Using logistic regression, there was no association between pre-op iron transfusion and RBC transfusion (OR 1.09; 95% CI 0.56-2.16, p=0.796), nor was there a protection against the volume of units transfused (IRR 1.18; 95% CI .57-2.44 p=0.654).

**Conclusion:** Consistent with the current equipoise, we did not observe a protective effect of pre-operative iron transfusion against either receiving RBC transfusion, or against the volume of units transfused. Despite this being a widely adopted haemoconservative measure, until a well-designed and appropriately powered study is performed evidence for its ongoing use is lacking.

### STOPPING A BLEEDING HEART: THE IMPACT OF INTRA-OPERATIVE PROTAMINE:HEPARIN RATIOS ON RBC TRANSFUSION IN A TERTIARY CARDIAC CENTRE FROM 2011-2015

Dr Stephen **Kunz**, Ms Kelly Mirowska-Allen,
Mr Damian Ianno, Mr Siven Seevanayagam

*Austin Hospital, Melbourne, VIC*

**Purpose:** Accurate dosing of protamine reversal following on-pump procedures is difficult, with mismatch recognised to increase the risk of bleeding. The ratio used for this dosing varies between institutions, as does transfusion practice. Following a change of practice within our unit, we retrospectively examined our centre's previous 5 years of CABGs and single valve repairs, hypothesising that a increased protamine:heparin ratio may confer a greater risk of transfusion.

**Methodology:** A case-control study was undertaken at a single tertiary cardiac unit, reviewing all cases of on-pump CABGs and single valve repair/replacements from January 2011 to December 2015. Variables examined included total intra-operative heparin and protamine administered, stratified to three groups (low: ≤0.6 mg per 100IU of heparin, moderate: 0.6-1.0, and high: ≥1.0), and compared these with the primary outcomes of PRBC transfusion, along with the number of units transfused. Additionally population data such as age, sex, Euroscore, pre-operative haemoglobin were noted.

**Results:** Of the 803 patients identified, 343 received a blood transfusion, with 1054 units used. 18.40% of individuals (149) received a low protamine:heparin ratio, 50% (405) received a moderate ratio, and 31.60% (256) a high ratio. Using the moderate protamine:heparin dosage group as a reference range, low dose protamine:heparin 49.1% less likely to receive a PRBC transfusion (OR 0.519; 95% CI 0.321-0.838 p=0.007) while the high dose group carried a 3.32x increased risk of transfusion (OR 3.320; 95% CI 2.337-4.718 p=0.000).

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Conclusion:** Higher doses of intra-operative protamine relative to heparin had a powerful association with the likelihood of transfusion.

### SWING LOW – THE NATURAL HISTORY OF HAEMOGLOBIN FOLLOWING CARDIAC SURGERY, OVER 5 YEARS AT A SINGLE TERTIARY CENTRE

Dr Stephen **Kunz**, Ms Kelly Mirowska-Allen, Mr Damian Ianno, Mr Siven Seevanayagam

*Austin Health, Melbourne, VIC*

**Purpose:** Following both CPB and cardiac surgery in general, there is a disturbance to haemoglobin (Hb) levels born of dilution, and bleeding. While the haemoglobin level is often utilised in decisions to transfuse, its significance in the setting of iatrogenic drift can be troublesome. Following an increase in transfusion inconsistent with guidelines at our institution, we investigated the natural history of haemoglobin levels following cardiac surgery, to lend further confidence to the decision not to transfuse on haemoglobin alone.

**Methodology:** An observational study was undertaken at our centre, reviewing all cases of CABGs and single valve repair/replacements between January 2011 and December 2015. Those that received red blood cell transfusion were excluded. Variables included pre-operative haemoglobin, haemoglobin on arrival to ICU, formal haemoglobin nadir and its timing, and the haemoglobin on discharge.

**Results:** Of 912 patients identified, 399 were excluded due to having received a PRBC transfusion. The median pre-operative Hb was 145g/L, dropping to a median Hb of 104g/L on arrival to ICU, 88g/L as nadir, and 98g/L on discharge. Median nadir timing was day 3 post-operatively, 1 day sooner than prior, lower powered studies. 10 of these patients had a nadir of 70g/L or less, which could otherwise have justified receiving a transfusion consistent with current guidelines.

**Conclusion:** As expected, haemoglobin trends down following cardiac procedures, by approximately 41g/L to arrival in ICU, and a further 18g/L between that and their nadir. Despite this, it is reasonable to expect an uptrend prior to discharge, lending credence to haemoconservative measures to avoid the morbidity and mortality associated with transfusion.

### THE CLOT THICKENS: ANTI-FIBRINOLYTIC USE AND ITS EFFECT ON BLOOD TRANSFUSION OVER 5 YEARS IN CORONARY ARTERY BYPASS GRAFTS AND SINGLE VALVE REPAIRS

Dr Stephen **Kunz**, Mr Damian Ianno, Ms Kelly Mirowska-Allen, Mr Siven Seevanayagam

*Austin Hospital, Melbourne, VIC*

**Purpose:** While its use within cardiac surgery is almost ubiquitous, studies on the effects of anti-fibrinolytics have focused on red blood cell (RBC) transfusion as a binary, rather than on the volume of units transfused. After a spike in our centres use of RBCs, we undertook an audit of the past 5 years to determine if our experience with antifibrinolytics matched the literature and if, once transfused, they impacted on the volume of products given.

**Methodology:** A case-control study was undertaken at a tertiary institution, reviewing all cases of CABGs and single valve repair/replacements between January 2011 and December 2015. Variables assessed included age, sex, euroscore, pre-operative haemoglobin and bypass time, along with antifibrinolytic use. Outcomes included RBC transfusion, volume of units transfused, and length of stay.

**Results:** Of the 912 patients identified, 62 were excluded due to being enrolled in other trials that influence transfusion behaviour, and 2 for their status as Jehovah's witnesses. For the 848 that remained, 530 received intra-operative anti-fibrinolytics and 393 received a RBC transfusion, consisting of 1242 units transfused. While patients were 29% less likely to receive a RBC transfusion if they received an anti-fibrinolytic (OR 0.71; 95% CI 0.53-0.94 p=0.020), this protective association did not extend to the volume of units transfused (IRR 1.12; 95% CI 0.71-1.78 p=0.607).

**Conclusion:** While intra-operative anti-fibrinolytics were associated with a decreased risk of receiving a post-operative blood transfusion, this did not translate to a decreased volume once a patient required a transfusion. We anticipate the ATACAS results regarding tranexamic acid use may lend further insight into this association.

### IDIOPATHIC CHYLOTHORAX AND CHYLOUS ASCITES PRESENTING AS DISCHARGE PER VAGINUM TREATED WITH PLEURODESIS

Dr Lisa **Lim**, Dr Sumit Yadav

*The Townsville Hospital, Townsville, QLD*

Concomitant chylothorax and chylous ascites is a rare clinical phenomenon. We report the case of an adult-onset chronic idiopathic chylothorax and chylous ascites presenting with a chylous vaginal discharge which failed conservative treatment. This 61yo woman presented with a 2-year history of cough, dyspnoea, weight loss and general malaise, with later onset chylous vaginal secretion and abdominal distension. CT imaging confirmed the diagnosis of bronchiectasis, a large left pleural effusion and ascites, and pleurocentesis and ascetic taps confirmed the fluid as chyle. Known causes of chylothorax and/or chylous ascities include trauma, infection, malignancy, lymphangiodysplasia, lymphangioleimyomatosis (LAM), systemic lupus erythematosis (SLE) and sarcoidosis. CT, MRI, mammography, lymphangioscintigraphy, bronchoscopic biopsies, endoscopy, laparoscopy and serology excluded all known causes. In an attempt to minimise the malnutrition and immunosuppression resulting from loss of large volumes of fluid, protein, immunoglobulins and lymphocytes, all conservative options were trialled. Unfortunately however,

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a fat-free diet with medium chain triglyceride (MCT) supplements, pleural and peritoneal drainage, somatostatin, octreotide and total parental nutrition (TPN) all failed to have a clinical impact. She proceeded to having a left video-assisted thoracoscopic (VATS) drainage of chylothorax and talc pleurodesis. The operation was successful in treating the chylothorax, and 6-month follow up has shown no recurrence.

### AN UNUSUAL PATHOGEN IN A LARGE MYCOTIC ASCENDING AORTIC ANEURYSM

Dr Lisa **Lim**, Dr Sumit Yadav

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Mycotic aneurysms of the ascending aorta represent a group of serious surgical conditions associated with significant morbidity and mortality. Large aneurysms due to anaerobic bacteria are uncommon, and can be a difficult microbiological diagnosis. We present the case of a 47yo man who presented with pleuritic chest pain and an incidental finding of a murmur. Echocardiography and CT-chest diagnosed a severely dilated ascending aorta up to 6.1cm with speckled diffuse calcification and moderate aortic regurgitation. An infective or vasculitic cause was suspected, but syphilis serology and vasculitic screen were both negative. He underwent an elective valve-sparing aortic root, ascending aorta and hemiarch replacement. The excised aortic tissue cultured Propionibacterium Acnes, and he completed a 6 week course of intravenous antibiotics. Although there are no published case reports of P. Acnes, data reported by Marques da Silva et al yielded a surprisingly high rate of culture-positive aortic tissue for resected aneurysmal walls. Out of 53 samples collected, 5 (9.4%) cultivated P. Acnes. In a smaller sample of 10 aortic specimens analysed with PCR, sequences of P. Acnes were positively identified in 5 (50%). The presence of this organism may be a coloniser, and does not necessarily confirm an infective cause for the aortic aneurysm, but in the case of our patient the clinical suspicion was high and he received full treatment. He remains well on annual surveillance, and has returned to work.

### TRANSAPICAL REDO-AORTIC VALVE IN VALVE IMPLANTATION WITH LEFT MAIN PROTECTION STRATEGY

Dr Prakash **Ludhani**, Dr Tanveer Ahmad, Dr Jane Hallam, Dr Ronen Gurvitch, Dr John Goldblatt, Dr James Tatotulis

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Transcatheter aortic valve implantation (TAVI) is mostly preferred for high-risk symptomatic group of patients with severe aortic stenosis. Surgical management of elderly patient with severe stenosis of bioprosthetic aortic valve (originally implanted 2005), coronary artery disease and porcelain aorta requiring Redo-aortic valve replacement (AVR) with coronary artery by pass is not only associated with high morbidity and mortality but is challenging and requires accurate pre-planning. We report a successful combine transapical valve in valve implantation (TA-TAVI) with Off pump coronary artery by pass grafting. Keywords Bioprosthetic valve-stenosis, valve in valve implantation, Transapical, Off pump coronary artery by pass grafting, Porcelain aorta

### 3D VATS – WHAT IS THE EVIDENCE?

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**Purpose:** Video-assisted thoracoscopic surgery (VATS) decreases perioperative morbidity and length of hospital stay compared with thoracotomy. Conventional VATS uses two-dimensional (2D) video display systems, but a significant limitation is poor depth perception, as operators must rely on 2D images to work in a three-dimensional (3D) space. 3D displays were introduced to overcome the challenge of operating with limited depth perception. The purpose of this review was to explore the impact of 3D vision on surgical performance in VATS.

**Method:** Relevant literature was identified through systematic searches of PubMed/MEDLINE, EMBASE and CENTRAL databases. Boolean logic was used to combine variations of the phrases "video-assisted thoracoscopic surgery" and "three-dimensional" in key word searching. Pre-determined inclusion and exclusion criteria were applied to select studies. Data extraction and analysis were conducted in a standardised manner across all studies and results were reported in the narrative form.

**Results:** Database searching yielded 374 results. Four articles satisfied inclusion criteria. 689 patients undergoing lobectomy, segmentectomy, wedge resection or oesophagectomy were included across the four studies. All studies reported 3D VATS reduced operating time while achieving at least equivalent patient outcomes. However, side effects such as nausea were reported in ancillary members of the surgical team in two studies. No study controlled for the potential confounders of operator stereoacuity, crosstalk conditions or equipment heterogeneity.

**Conclusion:** Further research controlling for potential confounders is required to determine the true effect of 3D vision in VATS.

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## REDUCING RBC TRANSFUSION IN CARDIAC SURGERY: A SINGLE CENTRE'S EXPERIENCE IN A MULTICENTRE QUALITY IMPROVEMENT INITIATIVE OF THE AUSTRALIAN AND NEW ZEALAND COLLABORATIVE PERFUSION REGISTRY (ANZCPR)

A/Prof Peter Klineberg, Mrs Pauline Hinks, Dr Hugh Playford, Mrs Rona Steel, Dr Catherine Harris, Dr Mark Priestley, Mr Ray Miraziz, Mrs Grace Agbulos, Mrs Monique Brouwer, Mrs Cheryl Dickson, Dr Graham **Meredith**

*Westmead Hospital, Sydney, NSW*

**Purpose:** To reduce RBC transfusion within a multicenter project of the Australian and New Zealand Collaborative Perfusion Registry (ANZCPR) through implementation of industry guidelines and avoidance of anaemia.

**Methodology:** This multicenter project was modeled on a single centre 3 phase study, where current processes were identified (phase I) then new protocols implemented (phase II) and follow up monitoring of progress (phase III) (Likosky 2010). Local sites formed a local multi-disciplinary quality improvement team to review current practice and incidence of transfusion for their site (phase 1). Our team included cardiac surgery, anesthetics, CICU, hematology, blood bank and perfusion. This team would then review current literature and guidelines and select initiatives and changes in practice they considered worthwhile (phase II). These were then relayed to staff and introduced. Then a 3 and 6 month follow up reporting changes in incidence of RBC transfusion fed back to team members and their staff (phase III). Concurrently, indications for each transfusion were also recorded in line with the project model.

**Results:** At our centre, each discipline was involved in introducing a variety of simple wide-reaching evidence based strategies with very small costs with spectacular results. Our centre has had a 57% reduction in the number of RBC units transfused for our open heart, RBC transfusion rate per 6 months has fallen 20%, and of those transfused, patients receiving more than 2 units has dropped 13%. Also, a 34% reduction in units of platelets given, 50% reduction in cryoprecipitate units and 49% reduction in units of FFP transfused. These changes in practice continue to improve transfusion rates.

**Conclusion:** A multidisciplinary team approach to RBC conservation using well established evidence- based guidelines can effectively optimize the use of blood products in a cardiac surgical setting and in a cost effective manner.

**References:** Likosky DS, Surgenor SD, Dacey LJ, et al. Rationalizing the treatment of anaemia in cardiac surgery: short and mid-term results from a local quality improvement initiative. Qual Saf Health Care 2010 19:392-398.

## A META-ANALYSIS OF THE EFFICACY OF ALLOPURINOL IN REDUCING THE INCIDENCE OF MYOCARDIAL INFARCTION (MI)

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**Purpose:** Myocardial infarction (MI) continues to be a leading cause of morbidity and mortality. Recent studies have suggested a novel cardioprotective role for allopurinol. This reviews aims to assess the efficacy of allopurinol in reducing the incidence of MI.

**Methodology:** MEDLINE, Scopus, Web of Science, and Cochrane Library databases were searched for randomised controlled trials (RCT) examining the efficacy of allopurinol in reducing the incidence of MI. Reference lists of included studies were also hand-searched. Data extraction and quality assessment were performed by two independent reviewers. RevMan 5.3 was used to perform formal tests of heterogeneity, fixed-effects meta-analysis and leave-one-out sensitivity analyses.

**Results:** 1034 citations were screened; only six studies satisfied the inclusion criterion. Published between 1988 and 1995, all of these studies examined the cardioprotective efficacy of allopurinol in the setting of coronary artery bypass graft (CABG) surgery. Perioperative MI was reported in 2 (1.77%) of 113 patients randomised to allopurinol and 14 (12.07%) of 116 control patients. Quality assessment revealed that methods of randomisation, allocation concealment and blinding were inconsistently reported. Fixed-effects meta-analysis ($I2 = 0\%$) identified a statistically significant, reduced incidence of MI (RR 0.21, 95% CI: 0.06, 0.70, p-value = 0.01) in allopurinol patients. In leave-one-out sensitivity analyses, the treatment effect became non-significant with the removal of one of the studies.

**Conclusion:** Based on limited evidence from small RCTs, allopurinol appears to decrease the incidence of perioperative MI following CABG. Further research is required to confirm these findings.

## HUGE ANTERIOR MEDIASTINAL TERATOMA: A CASE REPORT

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**Introduction:** Teratomas are the most common type of germ cell tumour in the anterior mediastinum. They are of equal distribution in both males and females with a peak incidence in young adults. Less than one percent are malignant, and should be surgically excised for pathologic analysis to detect occult cancer within the tumour. We describe the case of a

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16 year old male with the largest intrathoracic mature cystic teratoma reported in Australian literature to our knowledge.

**Methodology:** Retrospective analysis of case data including pre-operative, intra-operative and post-operative, including laboratory and radiological investigations was performed.

**Results:** A 16 year old male presented initially with shortness of breath on exertion over two weeks. He had no other symptoms. Investigations revealed a large left intrathoracic mass with a profound mediastinal shift to the right, with an AFP of 5 kU/L. The patient underwent a sternotomy and excision of the tumour. The mass was completely excised and measured 29.5 cm x 20.4 cm x 13.3 cm, weighing 4.425 kilograms. Histopathology confirmed a mature cystic teratoma. His postoperative course was largely uneventful and he was discharged on the 5th hospital day. Follow up at one month demonstrated good recovery with improving exercise tolerance.

**Conclusions:** This is the largest intrathoracic mature cystic teratoma reported in Australian literature presently. It emphasizes the importance of anatomy knowledge and careful preoperative planning to carry out a not-so-routine surgical procedure successfully.

### ENDOSCOPIC VEIN HARVESTING EARLY ADOPTION: IS IT WORTH THE TROUBLE?

Dr Jose Martinelli **Nadal**, Dr Robert Xu, Dr Jason Varzaly, Dr Tovi Vo, Dr Victor Aguirre, Mr Michael Worthington

*Royal Adelaide Hospital, Adelaide, SA*

**Introduction:** The long saphenous vein remains to be the most utilized conduit in coronary artery bypass grafting (CABG). The most used technique in harvesting this conduit in Australia is the open vein harvest (OVH). Endoscopic vein harvesting (EVH) has become an alternative technique that is now mostly used in the United States and holds promise in decreasing leg wound morbidity, increasing patient wound satisfaction, and reducing long-term costs.

**Methodology:** A retrospective multiple-cohort study was carried out, comparing isolated CABG cases that utilized EVH with isolated CABG cases that made use of OVH over the period between February and July, 2016 at our institution. A total of 110 isolated CABG cases was identified, 23 utilising EVH (20.9%) and 87 using OVH technique (79.1%). Retrospective analysis of the data from each case including preoperative to postoperative management was performed, specifically comparing rate of leg wound complications, and further management post discharge.

**Results:** Isolated CABG cases using EVH had one leg wound complication at the time of the patient's discharge (4.3% of EVH group), compared to eleven leg wound complications in the OVH group (12.6% of OVH group) that necessitated further management and follow up either with the our unit's wound clinic or the patient's GP.

**Conclusions:** Endoscopic Vein Harvesting even in its early adoption already has a positive impact in terms of further decreasing infection rates and therefore decreasing postoperative management costs. Further studies are now needed looking at long term patient survival.

### A RARE EGG SHAPED LEFT VENTRICULAR PSEUDOANEURYSM IN THE TRANSPLANTED HEART

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**Purpose:** Most aneurysms of the left ventricle are true aneurysms occurring with dilation and scaring of the left ventricle. This is a case of a pseudoaneurysm arising from the left ventricle in a patient two years post cardiac transplantation for familial dilated cardiomyopathy. Pseudoaneurysm is a blood filled sac that evolves outside injured vasculature though contained within the adventitia. The nature of pseudoaneurysm predisposes to spontaneous rupture, due to its disorganised wall structure during development. Ruptured pseudoaneurysm of the left ventricle has life threatening potential. Due to the suspected iatrogenic nature of the pseudoaneurysm this condition could potentially arise in any cardiac surgical patients.

**Methodology:** A 63-year-old female two years post orthotopic cardiac transplant for familial dilated cardiomyopathy initially presented with pneumonia. Subsequent CT scan revealed a mass on the anterior surface of the heart. In view of her history further investigation (images) were as follows. Transthoracic echocardiogram demonstrated blood flow via a sinus between the mass and left ventricle. MRI showed prevalence of swirling motion within the aneurysm measuring 26mm transverse x 20mm craniocaudal x 30mm anteroposterior. CT aortogram revealed the three dimensional structure of the mass.

**Results:** The patient was placed on bypass, the pseudoaneurysm explored, incised and its sinus oversewn.

**Conclusion:** Initial investigation for pneumonia resulted in emergent cardiac surgery, a life threatening condition that could occur in any post cardiac surgical patient due to its likely iatrogenic nature. The patient was discharged home with an intact closure of her left ventricular pseudoaneurysm.

### IMAGING FOR CEREBRAL COMPLICATIONS OF INFECTIVE ENDOCARDITIS: A 10 YEAR REVIEW

Dr Sarah **Page**, Dr Edward Buratto, A/Prof Andrew Newcomb

*St Vincent's Hospital Melbourne, VIC*

Infective endocarditis (IE) is a serious condition with a one-year mortality rate approaching 40%.[1] Early diagnosis and treatment reduces the incidence of septic embolism and mortality.[2] This study explores the use of MRI for screening

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of cerebral complications of IE within our institution over a 10-year period. Cerebral imaging requests and reports at our institution from 2003-2013 were searched for IE related complications and the presence of symptoms indicating cerebrovascular involvement. Cerebral MRI was ordered in 61 patient admissions, 38 of which were positive. In 24 cases the MRI was following a cerebral CT scan, and of these 8 had a positive cerebral MRI following a negative cerebral CT. There were no negative cerebral MRIs following a positive cerebral CT scan. In 14 patient admissions cerebral MRI was requested for screening purposes, 4 of which had positive findings. Early detection of asymptomatic cerebrovascular complications through the use of systematic cerebral MR in suspected IE cases may be the prompt for more aggressive surgical management.

**References:** 1. Murdoch DR et al. "Clinical Presentation, Etiology and Outcome of Infective Endocarditis in the 21st Century: The International Collaboration on Endocarditis-Prospective Cohort Study." Archives of internal medicine 169.5 (2009): 463–473. PMC. Web. 23 Aug. 2015. 2. Erba PA, Conti U, Lazzeri E et al. Added value of 99mTc-HMPAO–labeled leukocyte SPECT/CT in the characterization and management of patients with infectious endocarditis. J Nucl Med. 2012; 53:1235-43.

### A 'PATCHY' APPROACH TO CHEST WALL RESECTION AND RECONSTRUCTION FOR MALIGNANCY

Miss Gianna **Pastore**, Dr Laura Fong, Prof Mark Newman, Dr Lucas Sanders

*Sir Charles Gairdner Hospital, WA*

**Purpose:** Chest wall resection for malignancy can result in a significant defect requiring reconstruction. We noticed at our institution that the use of 2mm polytetrafluoroethylene (GORE-TEX) patches for chest wall reconstruction was associated with a high rate of post-operative seroma. Local innovation to resolve this problem is to use an aortic punch and place perforations in the patch. This allows any accumulated fluid to drain into the pleural cavity to be reabsorbed. We aimed to determine the factors associated with successful reconstruction with the use of a fenestrated GORE-TEX patch and our rates of post-operative complications, in particular seromas. There is a paucity of literature reporting the rate of post-operative seroma with the use of GORE-TEX patches.

**Methodology:** We conducted a retrospective single-institution review of all the patients who underwent chest wall resection and reconstruction using a fenestrated GORE-TEX patch over a 2.5 year period. Patient characteristics, co-morbidities, operative data, reconstructive methods and materials were recorded. Complications and outcomes were reviewed, as well as the management of these complications.

**Results:** From January 2013 to July 2016, eleven patients underwent chest wall resection and reconstruction with a fenestrated GORE-TEX patch. A multidisciplinary approach was undertaken for all cases with input from orthopaedic surgery and plastic surgery where appropriate. There was no 30 day mortality. Mean follow-up time was 15 months.

**Conclusion:** There were no cases of post-operative seroma with use of the fenestrated GORE-TEX patch.

### SHORT TERM FOLLOW UP OF LOW EJECTION FRACTION PATIENTS IN TOWNSVILLE

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**Purpose:** Patients with poor ejection fraction (EF) are often considered high risk candidates for cardiac surgery and require extensive pre-op multidisciplinary planning as they are often associated with increased morbidity and mortality.

**Methodology:** A retrospective audit was conducted on all patients with an EF of 30% or less who underwent cardiac surgery in Townsville in 2014 and 2015. Information was collected regarding: patient demographics; pre-op morbidities; EF; surgical details; use of Levosimendan and patient status at most recent follow up (6 or 12 months post op).

**Results:** There were 25 patients, 84% male and 16% female, with a mean EF of 26.3% (SD 8.0) and a mean age of 58.6 (SD 11.7). Hypertension (64%) and smoking (80%) were the most prevalent risk factors amongst the group. 64% presented urgently for surgery with 32% having had a STEMI. 92% had CABG or CABG with valve surgery. Pre-op optimisation included the use of IABP (64%) and Levosimendan (36%). There was a 4% mortality at follow up and 72% had a post-op echo, of which 76% showed an improvement of EF. The average improvement was 14% (SD 7.74%). 36% of these had IABPs, 36% had IABP and Levosimendan and 28% had neither. Of those, the patients who had both IABP and Levosimendan had the greatest increase in ejection fraction at follow up (17% as opposed to 13%) although this was not a statistically significant difference.

**Conclusion:** With more options available for stenting, an increasing number of low EF patients are presenting for surgery. Consideration of IABP or use of Levosimendan in conjunction with other pre-operative management may increase EF in short term follow up and could be improve morbidity for this group of high risk surgical patients.

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## RESOLUTION OF LIVER CIRRHOSIS AFTER CARDIAC TRANSPLANTATION IN A PATIENT WITH A FONTAN CIRCULATION

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**Purpose:** Liver fibrosis is inevitable over time with a Fontan circulation. However, it no longer contraindicates heart transplantation in this cohort, with similar survival post-transplant in presence of cirrhosis.[1] We discuss a case demonstrating reversal of liver cirrhosis post-transplantation in a patient with a Fontan circulation.

**Methodology:** Serial liver testing via transient elastography (Fibroscan) and pathology before and after heart transplantation was performed in a 28 year-old male with failing Fontan physiology. Renal function was also assessed.

**Results:** The subject was born with double inlet left ventricle, pulmonary stenosis and situs inversus. He developed Fontan failure 18 years after initial atrio-pulmonary Fontan surgery, and had persistent NYHA class III symptoms despite Fontan conversion surgery. Pre-transplant Fibroscan suggested frank cirrhosis with median liver stiffness of 44kPa (normal <7kPa), ultrasound demonstrated evidence of portal hypertension, elevated liver enzymes (GGT 136, ALT 54) and thrombocytopenia due to hypersplenism. He had moderate renal impairment with significant proteinuria. After successful orthotopic cardiac transplant, there was marked reduction in liver stiffness to 11kPa. Repeat ultrasound showed normal portal vascular size with reduced splenomegaly. Liver and renal function as well as platelet count have normalised, with resolution of proteinuria.

**Conclusion:** Cardiac cirrhosis in a Fontan circulation is reversible with normalisation of physiology after cardiac transplantation. 1.Simpson K,Esmaeeli A,Khanna G,et al. Liver cirrhosis in Fontan patients does not affect 1-year post-heart transplant mortality or markers of liver function. J Heart Lung Transplant 2014;33:170-7.

## A SINGLE CENTRE OVERVIEW OF INFECTIVE ENDOCARDITIS – SURGICAL AND NON-SURGICAL MANAGEMENT

Dr Neelprada **Pradhan**, Dr Richard Lu, Dr Edward Buratto, Dr Paul Conaglen, Dr Jonathan Darby, Dr Andrew Wilson, Mr Philip Davis, Mr Andrew Newcomb

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**Introduction:** Infective endocarditis (IE) is a topic of ongoing interest due to the uniformly high mortality and high complication rates. The timing and precise indications of cardiac surgery in IE remains a topic of contention. We aimed to investigate patient characteristics and outcomes in surgically vs conservatively managed patients in order to provide insight into patient selection for surgery. We have also stratified surgical management into early and late groups to examine the effects of timing of surgery on mortality and morbidity.

**Methods:** A retrospective review of all IE patients presenting to St Vincent's Public Hospital, Melbourne between January 1999 to December 2012 was conducted.

**Results:** 346 IE cases were identified; 109 were managed surgically and 245 conservatively. Surgically managed patients had significantly lower rates of dialysis dependent chronic kidney disease (CKD) and liver disease ($p<0.01$) but higher rates of active congestive cardiac failure (CCF), new valvular regurgitation on presentation ($p<0.01$). Patients receiving operations had a longer length of stay ($p = 0.01$). Early surgical management however resulted in a shorter overall length of stay ($p < 0.01$) compared to delayed surgical management. On multivariate logistic regression, increased age and creatinine level >100 µmol/L were associated with a higher rate of in-hospital mortality.

**Conclusion:** In our experience relative indications for surgical management were active CCF and new valvular regurgitation. Relative contraindications to surgical management appear to be dialysis dependent CKD and liver disease. Additionally early surgery resulted in a lower overall length of stay in IE patients compared to the delayed approach.

## PROSTHETIC VALVE ENDOCARDITIS – A SINGLE CENTRE OVERVIEW

Dr Neelprada **Pradhan**, Dr Richard Lu, Dr Edward Buratto, Dr Paul Conaglen, Dr Jonathan Darby, Dr Andrew Wilson, Mr Phil Davis, Mr Andrew Newcomb

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**Introduction:** Prosthetic valve endocarditis (PVE) is a serious disease entity with very poor prognosis. It is relatively rare; occurring in 3-6% of prosthetic valve patients. Consensus regarding the benefit, indications and timing of surgery in management of PVE has not been reached. In this article we present our single institution experience of PVE.

**Methods:** This study represents a retrospective review of all PVE patients presenting to St Vincent's Public Hospital, Melbourne between the dates of January 1999 and December 2012. Data was recorded in Excel™ and analysed using GraphPad Prism v6 (for continuous outcomes) and with STATA 12™ (for categorical / binary outcomes).

**Results:** 57 patients with PVE were identified in this review. 18 patients were managed surgically and 39 patients managed non-operatively. Surgically managed patients had significantly higher rates of CCF ($p<0.01$), NYHA class III/IV dyspnea ($p=0.025$) and new valvular regurgitation ($p<0.01$). In hospital mortality and length of stay was not significantly different between the groups. Early surgical management was associated with a significantly reduced post operative stay (10.88+/-7.64 vs 32.57+/-13.28, $p<0.01$). But no significant differences in mortality or complication

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were noted. Multivariate logistical regression of in hospital mortality in all patients revealed the only factor independently associated with a higher rate of mortality was CCF on admission (OR 33.37, p=0.02).

**Conclusion:** At our institution relative indications for surgical management in PVE patients appears to be congestive heart failure, NYHA class III/IV dyspnea and new valvular regurgitation. Early surgery appears to have significantly reduced post-operative stay outcomes.

### LONG-TERM OUTCOME IN LEFT MAIN DISEASE OPERATED ON OR OFF-PUMP

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*Hospital Vall d'Hebron., Barcelona, Spain*

**Purpose:** To know long-term outcome in patients with left main disease operated off-pump.

**Methods:** From January 2001 to June 2005, a consecutive group of patients with left main disease who underwent on or off pump surgery and discharged hospital at our institution are compared. We have followed them. Our principal end-point has been mortality. Secondary end-points are recurrence of angina, new myocardial infarction, need of new revascularization and new cerebrovascular stroke.

**Results:** Three hundred and eight patients have been followed (180 off-pump and 128 on-pump)for mean time of ten years. Ten-years mortality was similar (29.1% vs. 34.2% off pump, p>0.05 ). In the same way, recurrence of angina (27.7% vs. 29.1% off pump), new myocardial infarction (11.3% vs. 8% off pump), need of new revascularization (17.3% vs. 8.7% off pump) or new cerebrovascular stroke (6.3 vs. 3.2% off pump) didn't show differences.

**Conclusion:** Off-pump revascularization in left main disease presents as good long-term outcomes as on-pump surgery.

### OFF-PUMP CORONAY ARTERY BYPASS GRAFTING DOES NOT WORSEN LONG TERM OUTCOMES

Dr Remedios **Rios**, Dr Alberto Igual, Dr Rafael Rodriguez, Dr Paula Resta, Dr Maria Sol Siliato, Dr Carlos Sureda, Dr Miguel Angel Castro, Dr Juan Manuel Gracia

*Hospital Vall d'Hebron., Barcelona, Spain*

**Purpose:** To discern if off-pump coronary artery bypass grafting (CABG) influences on ten-years outcomes in patients with left main disease.

**Methods:** From January 2001 to June 2005, a consecutive group of patients with left main disease who underwent on or off pump surgery at our institution are compared. Perioperative data were prospectively collected and compared. We perform a Cox-logistic regression with: age, sex, hypertension, diabetes, arteriopathy, renal insufficiency, chronic obstructive pulmonary disease, previous myocardial infarct and ejection fraction, type of surgery and incomplete revascularization.

**Results:** Three hundred and eight patients (180 off-pump and 128 on-pump) were operated and discharged from hospital in these period. After adjusting for clinical and surgical covariates, off-pump CABG did not emerge as a significant independent predictor of long-term mortality, recurrence of angina, new myocardial infarction, need for reintervention or new cerebrovascular stroke.

**Conclusions:** At ten years follow-up, off-pump CABG remains a safe and effective myocardial revascularization strategy with no adverse impact on survival or new cardiovascular events

### LONG TERM SURVIVAL IS ADVERSELY AFFECTED BY ANY USE OF SAPHENOUS VEIN GRAFT IN CORONARY BYPASS SURGERY

Prof Alistair **Royse**, Dr Zulfayandi Pawanis, Prof Colin Royse, Dr Sandra Clarke, Mr Jared Ou-Young, Dr David Eccleston, Dr Andrew Ajani

*University of Melbourne, Melbourne, VIC*

**Purpose:** The predominant technique of coronary bypass grafting (CABG) is a single internal mammary artery and supplementary saphenous vein grafts (SVG). Previous studies have examined an increasing number of arterial conduits; rather than exclusive use of arteries, total arterial revascularisation (TAR).

**Methods:** A single centre experience 1996-2003 for CABG was checked against the national death registry and supplementary investigator follow up. Overall analysis by the log-rank test (Kaplan-Mier). After exclusion of all incomplete preoperative records and redo CABG, the sample was subjected to Cox proportional hazards survival analysis for any use of SVG; and number of SVG grafts.

**Results:** Overall survival was adversely affected in 8242 participants, P<0.001 at 14.6±2.2 years postoperative. Absolute differences between groups were small but TAR group had fewer males, more hypercholesterolaemia, family history of ischaemic heart disease, obesity and surgical acuity, whereas the SVG group had more grafts and were older. Following exclusions, Cox proportional hazards analysis found a mortality hazard with any use of SVG to be 1.2 (95% CI 1.1-1.3), P<0.001. When analysed according to the number of SVG used (referencing SVG n=0), the mortality hazard for 1 SVG 1.2, 2 SVG 1.4, 3 SVG 1.3, 4 SVG 1.2 and 5 SVG 6.1, with all analyses P≤0.006.

**Conclusion:** The use of even one saphenous vein graft adversely influences survival and more than one worsens survival further compared to total arterial revascularisation.

Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

## THE CHANGE OF CORONARY GRAFTING STRATEGY IN A SINGLE INSTITUTION ALMOST 20 YEARS PRIOR

Prof Alistair **Royse**, Prof Colin Royse, Dr Zulfayandi Pawanis, Dr Sandra Clarke, Mr Jared Ou-Young, Dr David Eccleston, Dr Andrew Ajani

*University of Melbourne, Melbourne, VIC*

**Purpose:** The predominant technique of coronary bypass grafting (CABG) worldwide is a single internal mammary artery and supplementary saphenous vein grafts (SVG). Exclusive use of total arterial revascularisation (TAR) is rare.

Methods: A single centre experience 1996-2003 for CABG was analysed from institutional databases.

**Results:** There were 8242 participants, with those receiving TAR (n=6112) and any use of SVG (n=2100). Radial artery (RA) in SVG participants was 65.8% and for TAR was 86.1%. Of 25828 anastomoses performed, IMA was 44.1%, RA 44.4% and SVG 11.5%. Use of RA in 1996 was 58% and thereafter was >81.5%. In 1996 TAR was 40.2% but in all the remaining years TAR was 73.4 – 86.7%. TAR by surgeon was as low as 7.5% and 27.2% in two who retired in 1996 for the remainder was 56.2 – 97.9%.

**Conclusion:** A dramatic change in practice occurred in 1996 which was sustained and broadly applicable for the remainder of the study period. High rates of total arterial revascularisation was achieved.

## PRIMARY RIGHT ATRIAL ANGIOSARCOMA

Dr Bawar **Saeed**, Dr Lawrence Nair, Dr Douglas Bell, Dr Douglas Wall

*The Prince Charles Hospital, Brisbane, QLD*

**Case Report:** A 25 year old male presented with 3 months of progressive dyspnoea. CT finding a RA mass and large pericardial effusion that was drained, cytology did not identify malignant cells. Subsequent cardiac MRI revealed a heterogeneous RA mass measuring 7x7x9cm invading into the pericardium and suspended into the TV annulus. Transvenous biopsy under TOE and fluoroscopic guidance revealed angiosarcoma. The tumour could not be ressected due to the patient's body habitus (BMI 59) which prevented the use of CPB. The patient was referred for palliative chemoradiotherapy.

**Background:** Primary cardiac tumors are rare, with an incidence at autopsy from 0.0017-0.033%. Prognosis is dismal with median survival reported at 25 months. Primary cardiac angiosarcomas (PCAs) have a tendency to occur in the third to fifth decade and are more common in males. 90% of angiosarcomas are located in the right atrium. The lateral (free) wall of the right atrium is the most common site, the septum being spared in most cases. The clinical presentation of PCAs is often non-specific. The tumour has a propensity to involve the right side and so may present with right-sided heart failure, SVC obstruction, recurrent pericardial effusions or cardiac tamponade. In rare cases, the tumour may present with haemopericardium from rupture. The primary goal of treatment is total resection with RA reconstruction. Partial resection with adjuvant chemotherapy may be performed for palliative reasons. Prognosis remains poor with total resection shown to increase survival from 6 to 25 months after initial detection.

## CORONARY ARTERY BYPASS GRAFTING WITH AND WITHOUT MANIPULATION OF THE ASCENDING AORTA: A NETWORK META-ANALYSIS WITH 37720 CASES

Dr Michael **Seco**, Dr John Puskus, Prof Michael Vallely, Mr Dong Fang Zhao, Dr James Edelman, Prof Paul Bannon, Prof Michael Wilson, Dr Michael Byrom, Dr Vinod Thourani, Dr Andre Lamy, Dr David Taggart

*Royal Prince Alfred Hospital, Sydney, NSW*

**Purpose:** CABG is associated with an increased risk of post-operative stroke compared to percutaneous coronary intervention. It has been suggested that CABG techniques that eliminate cardiopulmonary bypass and reduce aortic manipulation may reduce the incidence of post-operative stroke.

**Methods:** A systematic review and network meta-analysis was performed to compare post-operative outcomes between all CABG techniques, including anaortic off-pump CABG (anOPCABG), off-pump with a partial clamp (OPCABG-PC), off-pump with the clampless Heartstring device (OPCABG-HS), and traditional on-pump CABG. Studies reporting the primary endpoint, 30-day post-operative stroke rate, were included in the Bayesian network meta-analysis.

**Results:** There were 13 included studies with 37,720 patients. At baseline, anOPCABG patients had higher previous stroke than the OPCABG-PC (7.4% vs 6.5%, P=0.02) and CABG (7.4% vs 3.2%, P=0.001) patients. anOPCABG was the most effective treatment for decreasing the risk of postoperative stroke (-78% vs CABG, 95% CI 0.14 – 0.33; -66% vs OPCABG-PC, 0.22 – 0.52; -52% vs OPCABG-HS, 0.27 – 0.86), mortality (-50% vs CABG, 0.35 – 0.70; -40% vs OPCABG-HS, 0.38 – 0.94), renal failure (-53% vs CABG, 0.31 – 0.68), bleeding complications (-48% vs CABG, 0.31 – 0.87), atrial fibrillation (-44% vs OPCABG-HS, 0.49 – 0.89; -29% vs CABG, 0.55 – 0.87; -20% vs OPCABG-PC, 0.68 – 0.97), and shortened length of ICU stay (-13.3 hours, -19.32 to -7.26, P<0.0001).

**Conclusions:** Avoidance of aortic manipulation in anOPCABG may decrease the risk of post-operative stroke, especially in patients with higher stroke risk. In addition, the elimination of CPB may reduce the risk of short-term mortality, renal failure, atrial fibrillation, bleeding, and length of ICU stay.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

### SURGICAL ABLATION OF ATRIAL FIBRILLATION DURING MITRAL VALVE SURGERY: A SYSTEMATIC REVIEW OF THE LITERATURE

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*Auckland City Hospital, Auckland, New Zealand*

**Purpose:** Chronic atrial fibrillation (AF) is commonly present in patients undergoing mitral valve (MV) surgery. Surgical ablation of AF during MV surgery is emerging as a reasonable treatment modality. However, there is no clear consensus despite some of the randomised studies (RCT's) recommend surgical ablation in control of AF. The present systematic review aims to critically analyse the utility of surgical ablation in patients with chronic AF undergoing MV surgery and the evidence for its use.

**Methodology:** A total of 13 RCT's were selected by utilizing electronic database from Medline, EMBASE, Cochrane, Scopus and PubMed. Only RCT's using surgical ablation and control, with follow-up reporting AF comparisons between the groups were included in the study.

**Results:** Thirteen trials with 815 participants (437 ablations and 378 controls) provided data for analysis. The ablation group was associated with significantly lower incidence of AF recurrence compared to control group at all time intervals of follow-up ($p < 0.00001$). There was no difference between the groups in surgical mortality, late mortality or requirement of permanent pace maker (PPM). The quality of evidence for these studies as analysed by GRADE method were moderate level for the different variables.

**Conclusions:** The result from the present study demonstrates superiority and safety of surgical ablation in patients with chronic AF undergoing MV surgery in maintaining short to mid-term sinus rhythm. However further research is required to evaluate the type of surgical ablation and also long term follow-up about its utility.

### ANOMALOUS AORTIC ORIGIN OF LEFT CORONARY ARTERY LEADING TO SUDDEN CARDIAC ARREST IN YOUNG FEMALE

Dr Vinod **Sharma**, Dr Andrew Clarke, Dr Fiona Doig, Dr Swaroop Margale, Dr Rishendran Naidoo

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** Anomalous aortic origin of the coronary artery(AAOCA) is an uncommon but important cause of sudden death in young patients. Vigilance is required to ascertain a prompt diagnosis and expedite surgery to prevent further fatal events. We describe a case of a 20-year-old female with an anomalous left coronary artery origin, whose presentation and path to diagnosis and treatment is outlined.

**Methodology:** A 20 year old female presented following an out of hospital cardiac arrest (OOHCA) whilst swimming. ROSC was achieved with CPR and a single defibrillation from an AED. History revealed recurrent episode of chest pain and syncope over the previous 4 years. She was evaluated 3 years prior by cardiology; TTE and EST were found to be normal and EP review for prolonged QTS stratified her as a low risk for QTS. She was discharged without further investigations. CTCA performed following her arrest revealed an anomalous left coronary artery, arising from the right coronary sinus, passing intramurally between the aortic root and pulmonary trunk. This was repaired by deroofing the left coronary artery across the top of the left and right commisure of the aortic valve. The aortic valve commisure was re-suspended with good outcome.

**Results:** Surgery provided excellent immediate results and exercise stress test at 6 months was negative. She remained asymptomatic with no further episodes of chest pain or syncope and is now able to perform strenuous activities.

**Conclusion:** The AAOCA arising from the opposite sinus of valsalva is a rare but an important condition which targets children and adolescents with an often fatal outcome if diagnosis is missed.

### OVERCOMING THE LEARNING CURVE IN THE MINIMALLY INVASIVE MITRAL VALVE REPAIR

Dr Vinod **Sharma**, Dr William Foot, Dr Jonathan Hartono, Dr Homayoun Jalali

*The Prince Charles Hospital, Brisbane, QLD*

**Purpose:** Minimally invasive mitral valve surgery has become the routine approach to mitral valve disease in some centres. However, most reports come from overseas high-volume centres with extensive experience in these techniques. Surgeons at other centres may be reluctant to adopt the minimally invasive approach because of the initial learning curve involved.

**Methodology:** One hundred consecutive (cases number 1-100), unselected minimally invasive mitral valve repairs performed by a single operator across two Queensland institutions were reviewed. Outcomes including repair results and any adverse events (i.e. conversion to sternotomy, re-exploration for bleeding, valve-related reoperation during hospitalisation, new dialysis, stroke, MI, low cardiac output syndrome or death) were studied. Strategies, safeguards and troubleshooting methods are also discussed.

**Results:** There was no operative mortality, no conversion to sternotomy and no unplanned valve replacements. All patients left the operating room with no more than no, trace or at most mild mitral regurgitation.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Conclusion:** It is undeniable that a learning curve exists for minimally invasive surgery of the mitral valve. Although the number of operations required to overcome the learning curve is substantial, marked variation exists between individual surgeons and institutions. Studies such as this could be very helpful in structuring future training and maintenance of competence programs for this kind of surgery in Australia.

### CARDIOPULMONARY BYPASS IN NON-CARDIAC SURGERY: AN ADELAIDE EXPERIENCE

Dr Timothy **Surman**, Mr Michael Worthington, Dr Maritnelli Nadal

*D'Arcy Sutherland Cardiothoracic Surgical Unit, Adelaide, SA*

**Background:** Cardiopulmonary Bypass (CPB) and Extracorporeal Membrane Oxygenation (ECMO) is used to facilitate circulatory support in standard cardiac surgery and emergency intervention. However, CPB and ECMO is not used routinely in non-cardiac surgery procedures involving the thorax and major vessels. We aimed to explore the value of CPB and ECMO as a standby procedure for all bailout non-cardiac surgical procedures that risk circulatory compromise.

**Methods:** An eight-year retrospective study of all cases from 2006-2014 in the Royal Adelaide Cardiothoracic Surgery Unit was investigated either as independent or combined unit procedures. Of the 1816 non-cardiac cases managed by the cardiothoracic surgery unit, nine non-cardiac surgery cases requiring VA or cardiopulmonary bypass (CPB) and three cases requiring VV bypass (ECMO) were identified. Routine cardiac procedures and postoperative complications requiring CPB or ECMO were excluded from the study.

**Results and Discussion:** All non-cardiac surgery cases that were reviewed in our Adelaide study identify the value of VA or VV bypass in thoracic, renal and tracheal surgery. Of the six procedures involving the bailout use of CPB and ECMO intraoperatively, circulatory compromise was restored and all patients survived. CPB and ECMO should be considered routine as a standby support for all cases involving thoracic, renal and tracheal major surgery.

**Conclusions:** The Adelaide experience supports that CPB and ECMO should be used for all non-cardiac thoracic surgery cases and cases involving high risk of circulatory compromise such as major renal and tracheal surgery.

### POCT FOR APTT IN PATIENTS ON HEPARIN INFUSION – BENEFICIAL OR NOT?

Dr Timothy **Surman**, Mr Michael Worthington

*D'Arcy Sutherland Cardiothoracic Surgical Unit, Adelaide, SA*

**Purpose:** The time taken for laboratory based aPTT blood sampling, recovering the results and adjustments may compromise cardiac patient safety. The core aims of this study is to determine whether aPTT point of care testing (POCT) in post-operative cardiac surgery patients on heparin infusion improves the efficiency of inpatient anticoagulation monitoring, reduces the risks of over/under anticoagulation, improves patient outcomes, and reduces hospital testing costs.

**Methodology:** We retrospectively looked at 10 patients undergoing aPTT testing and reviewed error margins of testing. Following full ethics approval by the Royal Adelaide Hospital Human Research Ethics Committee (HREC), current Cardiothoracic Surgery Unit inpatients were enrolled in the study. A total of 50 samples were obtained and separated into three tiers; point of care testing group from finger prick test, point of care testing group from standard post-operative blood sample, and laboratory based testing of standard post-operative blood sample.

**Results:** There is evidence in the literature to suggest that bedside testing turnaround times is of benefit to inpatient care, and conversely that POCT is inaccurate. Our results will determine whether aPTT POCT will improve testing efficacy and patient safety in cardiac patients undergoing heparin infusion. Final results of this ongoing clinical study will be presented at the ANZSCTS conference in November.

**Conclusion:** Laboratory based aPTT assays necessitate a delay between blood sampling and dose adjustment. Point of care testing could permit immediate dose adjustments, potentially enabling tighter control of anticoagulation.

### HOW THEY FARE: OCTOGENARIANS UNDERGOING CORONARY ARTERY BYPASS GRAFTS

Dr Elizabeth **Suthers**, Dr Nikki Stamp, Mr Christopher Merry, Mr Robert Larbalestier

*Fiona Stanley Hospital, WA*

**Objective:** Cardiac surgery is begin performed on older and sicker patients with excellent outcomes. PCI may be used in preference for high-risk patients with IHD, who would otherwise benefit from CABG. This renewed our interest in the outcomes for octogenarians undergoing surgical revascularisation.

**Methods:** A retrospective analysis was performed, of 82 patients aged 80-89 years, undergoing CABG, from 2010-2016, at three Western Australian hospitals. Outcomes were 30 day mortality, stroke and duration of ICU and hospital stay, freedom from re-intervention, new renal failure and arrhythmia.

**Results:** The mean age was 82years with a 76% male preponderance. There was pre-existing CCF in 7% and 10% had a prior CVA. Fifty-four percent underwent CABG alone, while 39% had concomitant AVR. An IABP was placed for 3 people pre-operatively, and another one to facilitate wean from bypass. The mean ICU stay was 3 days and the mean total hospital stay was 13 days. Further rehabilitation was needed for 32%. One patient had a CVA and 37% developed

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

a new arrhythmia. There were 3 sternal wound infections requiring further intervention and 4 leg wound infections. The 30-day mortality was 1.5%. 2 patients required further PCI at mean follow up of 24 months.

**Conclusion:** The provision of CABG for octogenarians can be achieved with success and an acceptable risk profile, with increased requirement for critical care and rehabilitation.

### EXPERIENCE AND RESULTS WITH EXTRACORPOREAL MEMBRANE OXYGENATION FOR SEVERE ACUTE RESPIRATORY FAILURE IN A VICTORIAN ECMO CENTRE

Dr Arpit **Talwar**, Dr Nick Johnson, Dr Aidan Burrell, Dr Jayapadman Bhaskar, Dr Vincent Pellegrino

*Alfred Hospital, Melbourne, VIC*

**Purpose:** Patients with severe respiratory failure may require venovenous extra-corporeal membrane oxygenation (VV-ECMO) as a supporting therapy. This study presents eight years of experience from a Victorian ECMO centre. The aim of the study is to present outcome results and to investigate whether acute physiology and chronic health evaluation II & III (APACHE-II/III) and sequential organ failure assessment (SOFA) scores can be used to predict patients' outcome.

**Methodology:** All patients from January 2008 to December 2015 treated with VV-ECMO at the Alfred Hospital ICU were included in this study. Patient records were retrieved from the Alfred Hospital ICU ECMO database.

**Results:** 106 patients were included with median age 39.5 years (range 9-72). 72 (67.9%) of the patients were retrieved from referring hospitals for VV-ECMO with 26 (24.5%) patients having been commenced on VV-ECMO in the referring hospital. Of the 106 patients, 57 (53.8%) patients were commenced on ECMO due to pneumonia (viral and/or bacterial), 35 (33%) were due to ARDS and 14 (13.2%) in the perioperative setting for lung transplantation. The median duration of ECMO was 9 days (range 1-38). 84 (79.2%) of the patients could be weaned from ECMO whilst 26 (24.5%) patients died within 3 months. There were no statistically significant differences between patients who survived compared with those that died at 3 months when comparing APACHE II-III and SOFA scores.

**Conclusion:** VV-ECMO remains a rescue option for those with severe respiratory failure despite maximal medical therapy. Risk stratification models do not predict survival in these patients.

### NEW ONSET ATRIAL FIBRILLATION: PATTERN OF PRESENTATION AND 30 DAY OUTCOME

Professor James **Tatoulis**, Dr Rochelle Wynne, Dr Varun Sharma, Dr Guangchi Jiang

*The Royal Melbourne Hospital, Melbourne, VIC*

**Purpose:** New postoperative atrial fibrillation (AF) is a common and persistent problem, impeding early recovery after cardiac surgery. When AF persists anticoagulation is required that in turn leads to increased length of stay, and an increased of bleeding. Evidence describing the pattern of presentation of AF and time to inpatient resolution is scant.

**Methodology:** We prospectively tracked 200 consecutive cases of new onset AF, in adult cardiac surgery patients, at a single metropolitan referral centre in Melbourne. 30-day follow-up was complete.

**Results:** Of 823 patients from January 2014 to April 2015, 200 (24.3%) developed new AF, 52 hours (Q1 39, Q3 68) after surgery. AF persisted for 71.5 hours (Q1 19.8, Q3 121.2) prior to reverting to sinus rhythm (SR). There were 186 (93%) patients discharged in SR, 13 (6.5%) requiring direct current reversion (DCR). Of 14 (7%) patients discharged in AF, 7 (3.5%) were warfarinised and 2 were readmitted within 30-days; 1 with pericardial effusion and symptoms of tamponade and 1 with ongoing AF and shortness of breath. There were 5 (2.7%) patients discharged in SR and readmitted in AF none of whom had DCR on readmission. Beta blockade was the most frequent anti-arrhythmia on discharge (n = 149, 74.5%) followed by Digoxin (n = 75, 37.5%) and Amiodarone (n = 54, 27%) and 38 (19%) patients were warfarinised. At 30-days 4 (2%) patients remained in AF.

**Conclusion:** Few patients had persistent new AF on discharge and there were no major complications in this cohort.

### RISK FACTORS FOR DEVELOPING NEW RENAL FAILURE IN PATIENTS UNDERGOING CARDIAC SURGERY: A SINGLE CENTRE EXPERIENCE

Dr Sameer **Thakur**, Dr Mohammad Azari, Mrs Carmel Fenton, Mr Nick Carr, Dr Rajiv Sharma, Mr Mark Murton, Mr Keshav Bhattarai, Mr Ashutosh Hardikar

*Cardiothoracic Surgical Unit, Royal Hobart Hosptal, Hobart, TAS*

**Purpose:** Renal dysfunction is a well-recognised complication following cardiac surgery. We aimed to identify risk factors for development of renal dysfunction in a large series of patients undergoing cardiac surgery.

**Methodology:** A retrospective study was performed on all patients that have undergone cardiac surgery between April 2008 and January 2016 at our institute. Data for all patients were collected prospectively as part of a national database. Patient demographics and perioperative data were collected.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

New renal failure (NRF) was defined as two or more of the following; increased creatinine to >200µmol/l, at least a two-fold increase in creatinine over baseline, or a new requirement for dialysis.

**Results:** A total of 1921 patients underwent cardiac surgery during the study period with a mean age of 67±11 years. Preoperative mean creatinine was 92.8±62.1 µmol/L with 3.7% on dialysis, 2.1% with severe and 1.1% with moderate renal dysfunction. The commonest procedure was CABG (52%). NRF developed in 25 patients (1.3%). On multivariate analysis BMI (p=0.037), previous cardiac surgery (p=0.022), presentation with infective endocarditis (p=0.025), preoperative haemoglobin (p=0.02), preoperative creatinine (p=0.001), aortic cross clamp time (p=0.032), return to theatre (p<0.0001), time in ICU (p<0.0001), and return to ICU (p<0.0001) were independent factors for development of NRF. Overall early mortality was 1.1%, although early mortality was significantly higher in those with NRF compared to those without (24% vs 0.7%, p<0.0001).

**Conclusion:** A number of patient and perioperative risk factors were identified as significant for the development of NRF in a large series of patient undergoing cardiac surgery.

### THORACIC LYMPH NODE INVOLVEMENT IN COLORECTAL CANCER PATIENTS WITH PULMONARY METASTASIS: SHOULD ROUTINE MEDIASTINAL LYMPHADENECTOMY BE PERFORMED?

Dr Tovi **Vo**, Mr Michael Worthington

*Royal Adelaide Hospital, Adelaide, SA*

**Background:** Pulmonary metastasectomy is often performed for survival benefit in metastastic colorectal carcinoma [1,2]. The role of routine mediastinal lymphadenectomy in these patients remains unclear.

**Case report:** A woman with colorectal adenocarcinoma was found to have a right lower lobe nodule. PET CT showed no other pulmonary foci or lesions in the mediastinum. She underwent a metastasectomy with clear margins on histology. Hilar lymph nodes were not sampled. Progress scans revealed recurrence of the nodule with FDG avid hilar and mediastinal lymph nodes.

**Discussion:** There is much dispute on whether it should be standard practice to perform hilar and mediastinal lymphadenectomy with pulmonary metastastectomy, independent of radiological and intraoperative findings. Szöke et al confirmed mediastinal lymph node metastases in 33.3% of colorectal cancer patients with half having mediastinal involvement without hilar lymphadenopathy [3]. Another study which performed routine lymphadenectomy found 14.3% of patients had at least one malignant mediastinal lymph node [4]. Welter et al found in 169 patients with colorectal lung metastases, 16.6% had unexpected lymphatic spread with lymph node involvement being an independent prognostic factor [5]. These studies recommend mediastinal lymphadenectomy during the resection of colorectal cancer metastases is necessary [5,6].

**Conclusion:** It is debatable whether systematic lymphadenectomy should be performed routinely as part of pulmonary metastasectomy. Further studies (retrospective and prospective) with a larger population size and longer follow-up is required to assess the prognostic role of routine hilar and mediastinal lymphadenectomy with metastastic colorectal carcinoma patients.

### THE FANN OBJECTIVE STRUCTURED ASSESSMENT OF TECHNICAL SKILLS SCORE IN CARDIOTHORACIC SET TRAINEES UNDERTAKING CORONARY ANASTOMOSIS

Dr James **Wood**, Prof Michael Wilson, Mr Craig Savage

*Macquarie University, Sydney, NSW*

**Purpose:** To evaluate the technical skills of SET trainees in Cardiothoracic Surgery whilst undertaking a simulated coronary anastomosis

**Methodology:** All 24 (2015) RACS Cardiothoracic SET trainees carried out two simulated coronary anastomoses. 2mm diameter silicone vessels were anastomosed end to side using 7-0 prolene. Each procedure was captured using two opposing camera angles. The images were synchronized, edited and combined to provide the surgeon assessor with a single high definition movie comprising three views of the anastomosis. This movie was scored according to the Fann Objective Structured Assessment of Technical Skills (OSATS) score.

**Results:** An independent sample t-test demonstrated the mean Fann OSATS score was significantly higher for SET4-6 trainees when compared with SET1-3 trainees. Mean Score (±SD) for SET1-3=20.83±6.22 for SET4-6=24.15±5.71 a difference of 3.32 (95% CI, -6.5 - -0.1), t(54)= -2.068, p=0.043.

**Conclusion:** We have applied an OSATS scoring system to a cohort of SET trainees and demonstrated that it is possible to differentiate between junior and senior trainees based on this scoring system. We believe this will provide a reliable quantitative method of assessing progress in training on a regular basis. Reference Fann JI et al, JTCVS 2008;136:1486.

### USING 3D PHOTOGRAMMETRY IN CORONARY ANASTOMOSIS TRAINING

Dr James **Wood**, Prof Michael Wilson

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**Purpose:** To use 3D photogrammetry to quantify accuracy of suture placement during coronary anastomosis carried out by trainee surgeons.

## Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

**Methodology:** All 24 (2015) RACS Cardiothoracic SET trainees carried out two simulated coronary anastomoses. 2mm diameter silicone vessels were anastomosed end to side using 7-0 prolene. 2d images of each anastomosis were taken whilst it was rotated through 360 degrees. These images were aligned and used to build a dense cloud. The cloud image was used to create a 3D mesh that was then texturized. The surface texture included the detail of the sutures; this enabled the distance between sutures to be calculated on a 3D model.

**Results:** The inter-suture distance (ISD) was calculated for all anastomoses. On independent sample t-test there was no significant difference between the mean ISD between SET1-3 and SET4-6 trainees. However there was a difference in the variability of ISD between SET1-3 and SET 4_6 as measured by the standard deviation. Mean variability of ISD (±SD): SET1-3 0.59±0.20 mm, SET4-6 0.48±0.12 mm. A significant difference in variability of 0.12 (95% CI, 0.02-0.22), t (54)=2.63 p=0.011 d=25.

**Conclusion:** By using 3D photogrammetry techniques we have been able to reliably measure the distance between sutures used to construct a simulated coronary anastomosis. We found a significant difference between the ISD in those anastomoses carried out by early SET trainees and late SET trainees. We believe this will be an important tool to direct training in coronary anastomosis.

### SINGLE CENTRE REVIEW OF SURGICALLY MANAGED INFECTIVE ENDOCARDITIS

Mr Nima **Yaftian**, Dr Edward Buratto, Dr Jonathan Darby, Prof Andrew Wilson, Prof Andrew Newcomb

*University of Melbourne, Melbourne, VIC*

**Purpose:** Infective Endocarditis (IE) is a life-threatening illness that requires early intervention. We sought to identify the outcomes of all patients who underwent surgical intervention for IE at an Australian tertiary hospital.

**Methodology:** The study institution's Australian and New Zealand Society of Cardiac and Thoracic Surgeons (ANZSCTS) database was searched for all patients who underwent valve surgery with active IE between 2000 and 2015. Additional data was obtained by reviewing medical records.

**Results:** There were 133 patients who underwent surgical management of IE. Mean patient age was 54 ± 16 years. A history of IV drug use was present in 23% (31/133) of patients. The commonest infective agents were Staphylococcus aureus in 32% (42/133), of which 14% were MRSA (6/42), Streptococcus viridans in 15% (20/133), and Enterococcus faecalis in 13% (17/133). A single valve procedure was performed in 75% (100/133), while multiple valve procedures were performed in 25% (33/133). The surgical procedures were: aortic valve surgery in 68% (90/133), mitral valve surgery in 47% (63/133) and tricuspid valve surgery in 10% (13/133). Surgical mortality was 15% (20/133). On univariate analysis having emergency surgery (p=0.003), cross clamp time (p=0.015) and cardiopulmonary bypass time (p=0.03) were identified as significant risk factors for mortality. On multivariable analysis emergency surgery (p=0.021) was identified as a significant risk factor for mortality.

**Conclusion:** Surgery for infective endocarditis is associated with substantial early mortality. Emergency surgery is associated with increased risk of mortality. A Multidisciplinary approach with early referral to cardiothoracic surgery is indicated.

### HEART TRANSPLANTATION IN THE SETTING OF FONTAN-ASSOCIATED LIVER CIRRHOSIS: A CASE REPORT

Mr Xin Tao **Ye**, Dr Edward Buratto, Prof Yves D'Udekem, A/Prof Christian Brizard, Prof Igor Konstantinov

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**Introduction:** Liver cirrhosis is a common complication of a failing Fontan circulation. However, its impact on the outcomes of heart transplantation (HT) after Fontan failure is uncertain. Combined heart-liver transplantation (H-LT) is considered the only curative option in patients with irreversible cirrhosis secondary to failing Fontan. We report a case of Fontan-associated cirrhosis that was successfully palliated by HT alone, despite initial consideration for combined H-LT.

**Methods:** An 18-year-old woman presented for consideration of HT at 14 years post-Fontan completion on a background of unbalanced atrioventricular septal defect, dextrocardia, right atrial isomerism, ventricular failure and NYHA class III symptoms. Mean Fontan pressure was 18 mmHg. Abdominal ultrasound and subsequent CT revealed a cirrhotic liver with multiple regenerative nodules, portal hypertension with ascites, and three subcapsular lesions showing typical features of hepatocellular carcinoma. ALT and GGT were mildly elevated. Liver synthetic function was intact. The patient was planned for combined H-LT. Intraoperatively the liver transplantation was aborted due to satisfactory tolerance of the HT by the liver, complexity of the HT and long ischaemic time.

**Results:** Liver biopsy at 8 months post-HT excluded malignancy and confirmed the diagnosis of cirrhosis. At 2 years follow-up, the patient remained well in NYHA class I with compensated Child Pugh A cirrhosis. Liver functions remained stable and showed continuing improvement.

**Conclusion:** Fontan-associated liver cirrhosis may be associated with minimal liver dysfunction. Standalone HT may be feasible in such patients and can lead to both cardiovascular and hepatic improvement.

Poster Abstracts (cont'd) *Alphabetical order by presenting author's surname.*

## EARLY OUTCOMES OF SURGERY FOR CARCINOID HEART DISEASE

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**Purpose:** Survival of patients with metastatic neuroendocrine tumours has improved. However, the development of carcinoid heart disease (CHD) increases mortality. Valve surgery is demonstrated to improve survival and symptoms. We sought to assess the early outcomes of surgery for CHD.

**Methodology:** We retrospectively reviewed patients with CHD and metastatic neuroendocrine tumours undergoing valvular surgery over a 4-year period (2012-2016). A descriptive analysis was performed.

**Results:** There were 19 patients (mean age 63 years, range 29-77 years) who underwent surgery. Preoperative New York Heart Association (NYHA) class was III/IV in 14 patients (74%). The valves affected were: tricuspid (n=19; 18 replace, 1 repair), pulmonary (n=13; 13 replace), mitral (n=2; 2 replace) and aortic valve (n=2; 2 replace). Concomitant procedures included patent foramen ovale closure (n=7), right ventricular outflow tract (RVOT) (n=4) augmentation and coronary artery bypass grafting (n=2). There were 2 operative deaths (10.5%) due to right heart and liver failure. Five late deaths were due to cancer progression. Survival at 30-days and 1-year was 89±7% (95%CI: 64-97%) and 75±11% (95%CI: 45-90%), respectively. Follow-up for survivors was 92% complete at a mean of 12 months (range 2 months-3 years). All survivors were in NYHA I/II and none required reoperation. One asymptomatic patient developed RVOT obstruction after pulmonary valve replacement and another developed new carcinoid changes on an unoperated pulmonary valve. The remaining patients had normal valvular prosthesis function.

**Conclusion:** Surgery for CHD can be performed with satisfactory early results. Cardiac symptoms are improved and survival is determined by the primary malignancy.

## CARDIAC DEXTRO-ROTATION AS A COMPLICATION OF EMERGENCY PNEUMONECTOMY

Dr Bilal **Zahoor**, Prof Thomas Scalea, Prof James O'Connor

*University of Maryland / Shock Trauma Center, Maryland, USA*

Emergency pneumonectomy is often performed in the management of penetrating thoracic injury. The common complications associated with the procedure, post-operatively, are fatal despite aggressive management. These complications arise from an expeditious aberration in cardio-vascular homeostasis. We describe our successful experience in managing a young and otherwise healthy patient who sustained a penetrating thoracic injury necessitating emergency pneumonectomy. Expected, he developed complications of Superior Vena Cava (SVC) syndrome as well as dextro-rotation of the heart. His complications were successfully and optimally managed using Veno-Venous Extra Corporeal Membrane Oxygenation (VV-ECMO). ECMO is a useful adjunct in the management of penetrating thoracic trauma, especially when significant volume reduction of the cardio-vascular volume is urgent to equilibrate the abrupt decrease in pulmonary circulatory capacity which occurs post-pneumonectomy. ECMO is purported to offer a hope of survival in patients who sustain penetrating thoracic trauma and reduce the mortality rate of 50% generally observed amongst these select patients. To date, only a handful of reports describe the application of ECMO in patients who are subject to penetrating thoracic trauma; and rarely, a novel and unique complication of emergency pneumonectomy i.e. cardiac dextro-rotation. We hope our account, especially our illustrations depicting the patient's injury and subsequent surgical treatment and results pre/post ECMO adds to existent literature and supports on-going clinical research into ECMO intervention to lessen the bleak mortality associated with penetrating thoracic trauma.

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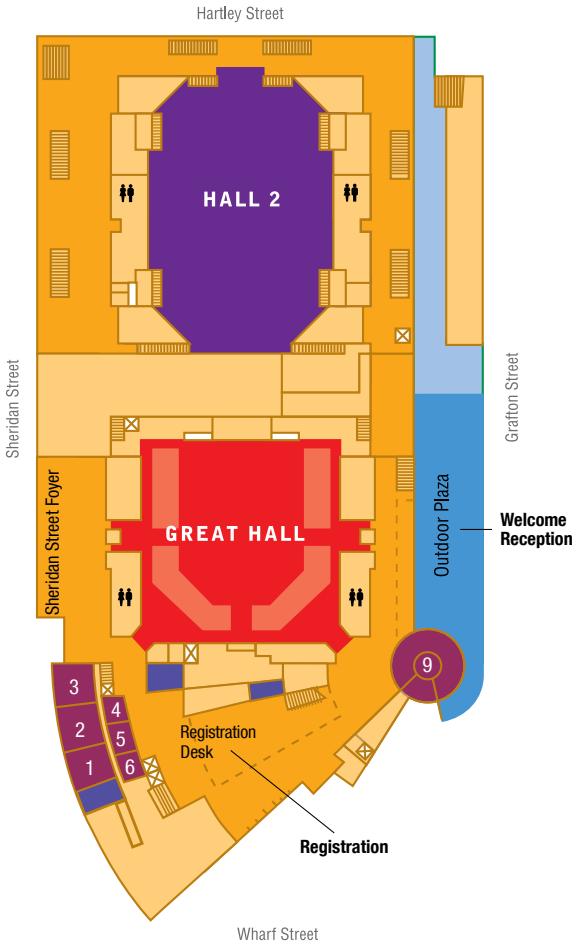
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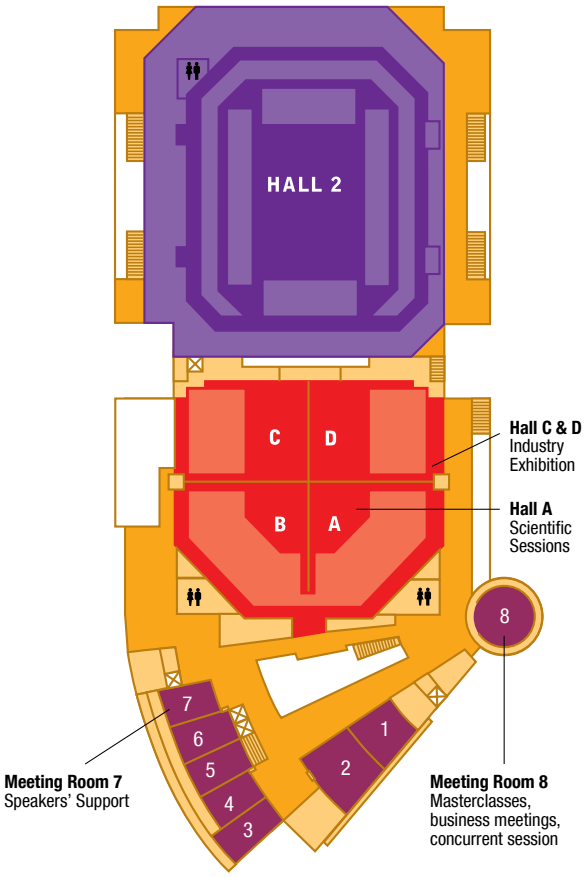


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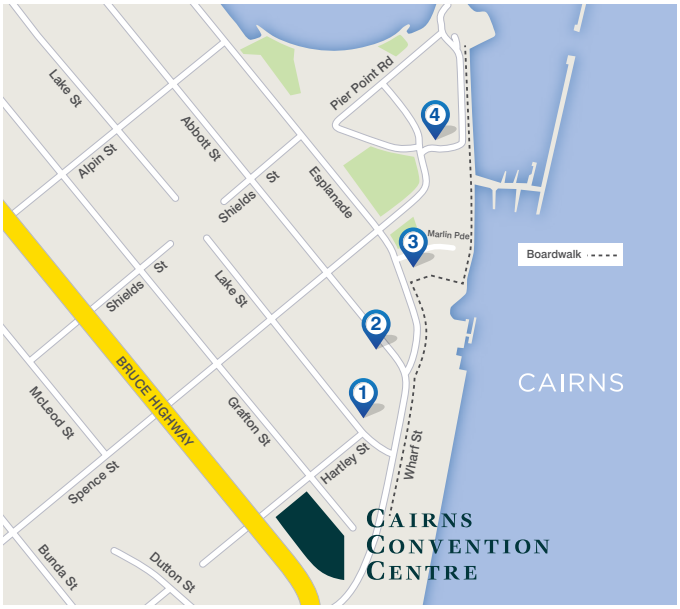
Exhibition Level




Mezzanine Level




# LOCATION MAP




1. Piermonde Apartments
2. Pullman Cairns International
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