



# ISHLT 2022 42nd Annual Meeting & Scientific Sessions

John B. Hynes Memorial Convention Center  
Boston, Massachusetts, USA

Wednesday, 27 April -  
Saturday, 30 April



## ISHLT2022 PRELIMINARY SCIENTIFIC PROGRAM

### SCHEDULE:

All sessions will take place between **27-30 April 2022** at the John B. Hynes Convention Center in Boston, MA, USA. Sunrise and Symposia dates and times will be determined in December 2021. Check the [Online Program Viewer](#) for the most up-to-date information.

### TABLE OF CONTENTS:

Sessions are listed first by **Session Type** (Plenaries, Sunrise Sessions, Symposia), then **Primary Core Therapy** (Heart, Lung, MCS, PVD, then **Primary Audience** (All, Anesthesia and Critical Care, Cardiology, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pathology, Pediatrics, Pharmacy and Pharmacology, Pulmonology, Research and Immunology). All sessions are **hyperlinked** for convenient navigation.

<b>PLENARY SESSIONS (105 minutes)</b> .....	<b>4</b>
Primary Core Therapy: <b>ALL</b> .....	4
Primary Audience: <b>ALL</b> .....	4
Opening Plenary Session.....	4
Plenary Session 2 .....	5
Plenary Session 3 .....	6
 <b>SUNRISE SESSIONS (60 minutes)</b> .....	 <b>7</b>
Primary Core Therapy: <b>ALL</b> .....	7
Primary Audience: <b>ALL</b> .....	7
Poised for Success: Tips and Pearls on Manuscript Submission and Effective Peer Review.....	7
 Primary Core Therapy: <b>HEART</b> .....	 8
Primary Audience: <b>Cardiology</b> .....	8
The Human Microbiome: Hopes, Threats and Promises .....	8
Pregnancy After Cardiothoracic Transplantation .....	9
What's New? Updates to the ISHLT Guidelines for the Care of Heart Transplant Recipients .....	10
Who's Keeping Score? Risk Scoring Systems and Contemporary Risk Factors for Primary Graft Dysfunction in Heart Transplantation .....	11
Primary Audience: <b>Cardiothoracic Surgery</b> .....	12
DCD Heart Transplantation and Ex Vivo Repair: Gift Box or Pandora's Box? .....	12
Primary Audience: <b>Nursing and Allied Health</b> .....	13
Survival of the Best Prepared: Strategies to Prevent Frailty and Deconditioning Before and After Cardiothoracic Transplantation .....	13
 Primary Core Therapy: <b>LUNG</b> .....	 14
Primary Audience: <b>Cardiothoracic Surgery</b> .....	14
From the Ground Up: Developing Lung Transplant Programs When Resources are Limited .....	14

Primary Audience: <b>Pediatrics</b> .....	15
Challenges in Pediatric Lung Transplant: What Learning Can We Impart to Our Adult Colleagues? .....	15
Primary Audience: <b>Pulmonology</b> .....	16
Gastrointestinal Issues in the Lung Transplant Recipient.....	16
The Long and Short of It: Telomeres in Lung Transplantation .....	17
The Path Forward in Developing Novel Therapies in Lung Transplantation .....	18
Primary Audience: <b>Research &amp; Immunology</b> .....	19
COVID-19 Lessons Learned: Immunology and Pathology in Cardiothoracic Transplant Recipients .....	19
Primary Core Therapy: <b>MCS</b> .....	20
Primary Audience: <b>Cardiology</b> .....	20
How to Heal a Broken Heart: Using Durable VADs to Promote Myocardial Recovery .....	20
Partners in Crime: The Right Ventricle and Pulmonary Hypertension in MCS.....	21
Primary Audience: <b>Cardiothoracic Surgery</b> .....	22
The Right to MCS: Are We Still Allowed To Say NO? .....	22
Primary Audience: <b>Pharmacy and Pharmacology</b> .....	23
Keep it Less Complicated: Minimizing and Treating Complications in LVAD Patients - From Bleeding to Infection 23	
Primary Core Therapy: <b>PVD</b> .....	24
Primary Audience: <b>Pulmonology</b> .....	24
Rookies and Sages: The International Pulmonary Hypertension Challenge .....	24
<b>SYMPOSIUM SESSIONS (90 minutes)</b> .....	<b>25</b>
Primary Core Therapy: <b>HEART</b> .....	25
Primary Audience: <b>Cardiology</b> .....	25
Cancer, Advanced Heart Failure, and Heart Transplant: Do Any of My Cells Work Properly? .....	25
Developments in CAV Imaging and Diagnosis: Time for an Update to the Guidelines? .....	26
Don't Lose Heart, as Better Times are Ahead: COVID-19 from Bench to Bedside .....	27
The Future is Multimodal: Imaging the Transplanted Heart for Rejection, Dysfunction and Vasculopathy .....	28
Heart, Liver, MCS, Oh My! Walking Down the Yellow Brick Road with Adult Congenital Heart Disease Patients ...	29
HLA and Non-HLA Donor Specific Antibodies in Heart Transplantation: It is Time to Look for The Forest Beyond The Trees.....	30
Relative Contraindications to Heart Transplantation: Where is the Line?.....	31
Revisiting the Status Quo: Changing Paradigms in Routine Heart Transplant Rejection Surveillance .....	32
Shock in a Box: What We Need to Learn About Heart Failure Cardiogenic Shock (HF-CS).....	33
Single, Dual, or Multiorgan Transplant: How Many is Too Much?.....	34
Surviving and Thriving After Heart Transplantation: In It for the Long Run! .....	35
Primary Audience: <b>Pediatrics</b> .....	36
It's Complicated! Psychosocial and Ethical Issues in Pediatric MCS and Transplantation .....	36
Real Options in Pediatric Heart Transplant: Small Infants, HLA Sensitization, and Non-invasive Rejection Screening .....	37
Primary Audience: <b>Pharmacy and Pharmacology</b> .....	38
Pets, Plants, & Palatables: When Living Life After Transplant Comes at a Cost.....	38
Primary Core Therapy: <b>LUNG</b> .....	39
Primary Audience: <b>Cardiothoracic Surgery</b> .....	39
Cut to the Chase: Lung Transplantation from the Operating Room to the ICU .....	39
Human versus Beast: Advances in Translational Models of Lung Transplant .....	40
Primary Audience: <b>Infectious Diseases</b> .....	41
Navigating the COVID Pandemic: Clambering into the Lung Transplant Life Raft .....	41

Vaccination in Cardiothoracic Transplant Candidates and Recipients: the Time is Now? .....	42
Primary Audience: <b>Pharmacy and Pharmacology</b> .....	43
Outside-of-the-Box Immunosuppression for Lung Transplantation .....	43
Primary Audience: <b>Pulmonology</b> .....	44
Equity and Equality in Cardiothoracic Transplantation: Access to Care.....	44
Improving Quality of Lung Transplant Care: Survival is Only the Beginning .....	45
Save the Beans: Recognition and Protection of Renal Function in Lung Transplantation .....	46
Take a Chance on Me: Updates in Lung Transplant Candidate Selection .....	47
Primary Audience: <b>Research &amp; Immunology</b> .....	48
Lung Transplant Biomarkers Now .....	48
Primary Core Therapy: <b>MCS</b> .....	49
Primary Audience: <b>Cardiology</b> .....	49
Body Composition and Durable MCS: Too Obese, Too Cachectic or Just Right - the Goldilocks Dilemma .....	49
The Cardiogenic Shock Journey: Shock Therapy.....	50
Double Trouble: End-Stage Renal Failure in End-Stage Heart Failure .....	51
Optimization of Management of Patients on LVAD Support: 2022 and Beyond .....	52
Unique Challenges for Women and Children Supported with MCS.....	53
Primary Audience: <b>Cardiothoracic Surgery</b> .....	54
The Risky Arrhythmia: Matching Risks and Benefits of Cardiac Devices in LVAD Patients .....	54
Structural Heart, Mitral and Tricuspid Valve Disease in LVAD Patients: Current Insight and Controversies .....	55
Primary Audience: <b>Nursing and Allied Health</b> .....	56
Train the Trainer and Trainer Best Practices: What MCS Clinicians Can Learn From Their Patients .....	56
Primary Core Therapy: <b>PVD</b> .....	57
Primary Audience: <b>Pulmonology</b> .....	57
Between a Rock and a Hard Place: Pulmonary Vascular Disease and Solid Organ Transplantation.....	57
Controversial Debates in Pulmonary Hypertension .....	58
Updates in Pulmonary Arterial Hypertension (PAH) Research: What is On the Horizon? .....	59

# PLENARY SESSION (105 minutes)

## Opening Plenary Session

Primary Core Therapy: ALL

Primary Audience: ALL

**Wednesday, 27 April 2022**

**8:00 AM - 9:45 AM**

**Session Chairs:** Laurie D Snyder, MD, MHS, and Lara Danziger-Isakov, MD, MPH

**8:00 AM** *Welcome to Boston*

**8:10 AM** *ISHLT2022 Scientific Program Chair Report*  
Laurie D. Snyder, MD, MHS, Duke University Med Ctr, Durham, NC, USA

**8:20 AM** *President's Report*  
Lara Danziger-Isakov, MD, MPH, Children's Hosp Med Ctr, Cincinnati, OH, USA

**8:35 AM** *ISHLT Announcement*  
Lara Danziger-Isakov, Cincinnati Children's Hospital Medical Center, Cincinnati, OH, USA

**8:45 AM** *Featured Abstract*  
TBD

**9:00 AM** *Going from Opt-In to Opt-Out: Lessons Learned from the UK*  
John Forsythe, MD, Organ Donation and Transplantation, NHS Blood and Transplant, Edinburgh, Scotland, United Kingdom  
*In 2015, Wales introduced an opt-out system and increased organ donation rate. More recently, Scotland and England changed their organ donation laws in 2020 to become opt-out as well. This lecture will discuss the background leading up to this change, patient advocacy influences, politics of the change and public information campaign to raise awareness.*

**9:25 AM** *Featured Abstract*  
TBD

# PLENARY SESSION (105 minutes)

## Plenary Session 2

Primary Core Therapy: ALL

Primary Audience: ALL

**Thursday, 28 April 2022**

**8:15 AM – 10:00 AM**

**Session Chairs: Sharon A. Hunt, MD, and Andrew J Fisher, PhD FRCP**

- 8:15 AM**      ***The Boston Marathon: What is So Special About It?***  
**Tom Grilk, President & CEO, Boston Athletic Association, Boston, MA, USA**  
*The Boston Marathon is the oldest annually contested marathon in the world, starting in 1897. Over those it has become known worldwide, but why? What makes it interesting, apart from pure antiquity?*
- 8:45 AM**      ***ISHLT International Thoracic Organ Transplant Registry Report***  
**Josef Stehlik, MD, MPH, University of Utah School of Medicine, Salt Lake City, UT, USA**
- 9:00 AM**      ***Featured Abstract***  
**TBD**
- 9:15 AM**      ***Introduction to 2022 Lifetime Achievement Award Recipient***  
**Kiran Khush, MD, MAS, Stanford University, Stanford, CA, USA**
- 9:20 AM**      ***2022 ISHLT Lifetime Achievement Award Recipient Lecture***  
**Hannah Valentine, MD, MRCP, Stanford University, Stanford, CA, USA**
- 9:45 AM**      ***Featured Abstract***  
**TBD**

## PLENARY SESSION (105 minutes)

### Plenary Session 3

Primary Core Therapy: ALL

Primary Audience: ALL

**Saturday, 30 April 2022**

**8:15 AM – 10:00 AM**

**Session Chairs:** Howard Eisen, MD, and Andreas Zuckermann, MD

**8:15 AM** *ISHLT Awards Presentations*

**8:30 AM** *The Limitless Future for RNA Therapeutics: Its Application in Heart and Lung Diseases*

**John Cooke, MD, PhD, Houston Methodist Academic Institute, Houston, TX, USA**

*mRNA vaccines have gained considerable attention with the COVID-19 vaccines but how did mRNA emerge as a therapeutic? What are the possibilities and obstacles for mRNA therapeutics in heart and lung disease?*

**9:00 AM** *Featured Abstract*  
TBD

**9:15-10:00 AM** *PRESIDENT'S DEBATE: We Don't Need to "See" Patients Anymore: Virtual Care Should Become Business as Usual*

*While some centers have extensive experience in virtual care, the COVID-19 pandemic restrictions forced more centers to adopt virtual clinical care as routine care. The debaters will consider aspects of multi-disciplinary care (pharmacy, nutrition, nursing and physician) delivery, how insurance may influence virtual care, incorporations of home monitoring devices into virtual care, biomarkers and need for surveillance biopsies, patient preferences and health equity issues in virtual care.*

**9:15 AM** *PRO:* Marta Farrero, MD, PhD, Hospital Clinic, Barcelona, Spain

**9:30 AM** *CON:* Glen P. Westall, FRACP, PhD, Alfred Hospital, Melbourne, Australia

**9:45 AM** *Debate Rebuttals*

## SUNRISE SESSION (60 minutes)

### Poised for Success: Tips and Pearls on Manuscript Submission and Effective Peer Review

Primary Core Therapy: ALL

Primary Audience: ALL

**Session Summary:** This session is designed to help early career and trainee members understand how to turn an idea into effective manuscript, how the submission process works at JHLT, and how early career/trainee members can become more involved in the JHLT publishing and peer review process. In this joint session, members of the JHLT Editorial Board and Early Career and Trainee Committee will discuss tips and pearls for manuscript submission and effective peer review.

**Session Chairs:** Paul Mohacsi, MD, and Martin Schweiger, MD, PhD

**Case Presentation: Taking an Idea to Manuscript and JHLT Submission**

**Kiran Mirza, MD, Rigshospitalet, Copenhagen, Denmark**

*Discussion about taking an idea, writing the manuscript and then deciding to submit to JHLT.*

**Great Ideas to Great Manuscripts: Pearls for Early Career Investigators**

**Michelle M. Kittleson, MD, PhD, Cedars Sinai Heart Institute, Los Angeles, CA, USA**

*We will discuss how you can take your project and develop it into an impactful paper for publication. Discussion will also focus on introduction of how to know where to submit your paper to fit within the journal's focus.*

**What We Look for at JHLT: Manuscript Workflow and Review Process**

**Daniel R. Goldstein, MD, University of Michigan, Ann Arbor, MI, USA**

*Here we will describe how a manuscript is handled by the editors and the criteria for sending a manuscript out to review. We will also describe how we expect the reviewers to judge a manuscript. Focus on the different categories for submission and how to tailor your work to those areas.*

**Case Presentation UPDATE**

**Kiran Mirza, MD, Rigshospitalet, Copenhagen, Denmark**

*Follow up from previous case which has now been reviewed by JHLT. Discussion will focus on receiving the reviewer comments and responding to them.*

**The Peer Review Process: How to Shine**

**Yael Peled, MD, Sheba Medical Center, Kiryat Ono, Israel**

*This presentation will focus on how to do a meaningful peer review and how the reviews are evaluated by the editors. Include discussion on how to respond to a variety of reviewer response types: the reviewer who didn't understand the primary focus of the paper, the insightful reviewer who wants things out of the scope and how not to be that reviewer.*

**Give Us Your Top Do's and Don'ts at JHLT**

**Christine Lau, MD, MS, University of Maryland, Baltimore, MD, USA**

*The speaker will discuss the do's and don'ts of finding mentors and projects, writing up the manuscript, responding to reviewers, discussion of digital presence including graphical abstracts and social media promotion.*

**Panel Discussion**

## SUNRISE SESSION (60 minutes)

### The Human Microbiome: Hopes, Threats and Promises

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS

Secondary Audiences: Infectious Diseases, Pharmacy, Research & Immunology

**Session Summary:** It is now understood that the human body is home to a multitude of niche environments, each with their own unique microbiome, which may modulate functioning of the associated organ system. The most researched of these is the gut microbiome. Although our initial understanding of the symbiotic relationship between the microbiome and the human body has stemmed from gut-based research, microbiome research has developed to include the reciprocal relationships between the microbiome and other organs including the heart and lung.

**Session Chairs:** Adriana Torres, MD, and Stephanie Pouch, MD

#### ***Send In Your Samples: What Can Be Learned From Analyzing Your Microbiome?***

**Tereza Martinu, MD, University of Toronto, Toronto, ON, Canada**

*Our microbiome is our 'second genome'. It dynamically integrates signals from the host and its environment, impacting health and risk of disease. This presentation will review the microbiome composition and function and how it may assist in personalized diagnostic assessment, risk stratification, disease prevention and treatment. The presentation will include advances in lung microbiome research, where gastroesophageal reflux disease and aspiration potentially impact the lung.*

#### ***Gut Microbiota and Metabolism of Immunosuppressive Drugs: One Size Does Not Fit All***

**Douglas L. Jennings, PharmD, New York-Presbyterian Hospital, New York, NY, USA**

*After transplantation, potent immunosuppressive drugs are required to prevent recipient immune activation and allograft injury. An intact microbiota is required to metabolize immunosuppressive drugs productively. Patients with a diverse gut microbiota tend to metabolize immunosuppressive drugs into potent metabolites that both prolong allograft survival but can also cause drug side effects. The speaker will describe published data that provides further insights into this complex relationship and identify future avenues for precision medicine-like approach to transplant care.*

#### ***Can Transplantation or LVAD Change My Microbiome ?***

**Melana Yuzefpolskaya, MD, Columbia University, New York, NY, USA**

*Heart failure is long recognized as a systemic disease state characterized by progressive increase in congestion, inflammation, and oxidative stress over time. Recently, imbalance of microbial communities in the gut, commonly referred to as gut dysbiosis, has been suggested as a potential contributor to HF progression. LVAD and heart transplant are well established treatment modalities for advanced heart failure, however their effect on gut dysbiosis has been poorly studied. The speaker will review literature and share their expertise in changes that occur in microbial communities with LVAD and heart transplant therapy.*

#### ***The Gut Microbiome and Heart Failure: Are We Ready for Therapeutic Trials Targeting Microbiome?***

**David Kaye, MD, PhD, The Alfred Hospital, Melbourne, Australia**

*The gut hypothesis of heart failure has been percolating in the literature over the last decade. The speaker will discuss several newly discovered gut microbial metabolic pathways, including the production of trimethylamine and trimethylamine N-oxide, short-chain fatty acids, and secondary bile acids, that may contribute to the development and progression of heart failure. The speaker will also discuss the gut microbiome as a novel therapeutic target for the treatment of heart failure, and potential strategies for targeting intestinal microbial processes.*

#### ***Panel Discussion***



## SUNRISE SESSION (60 minutes)

### Pregnancy After Cardiothoracic Transplantation

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: LUNG

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pharmacy, Pulmonology, Research & Immunology

**Session Summary:** This session aims to address pregnancy consideration after solid organ transplantation. The session will provide case presentations and discussions focused on contraceptive use, pre-conception counseling, management of immunosuppression, surveillance of rejection, treatment of rejection, and post-partum complications.

**Session Chairs:** Sonia Mirabet, MD, PhD, and David A Baran, MD

#### ***Evaluating Patients in a Cardio Obstetrics Program: Case Presentations***

**Patricia Chavez, MD, Montefiore Medical Center, New York, NY, USA**

*A series of cases will be presented, illustrating some of the challenges encountered when considering and managing pregnancies in cardiothoracic transplant patients.*

#### ***Pharmacologic Considerations with Pregnancy: Effects on Immunosuppression***

**Lilibeth Carlos, PharmD, St. Vincent's Hospital, Sydney, Australia**

*Review the pharmacokinetic changes throughout pregnancy and impact on immunosuppression monitoring, as well as discussing fetal/breastfeeding risk and alternative immunosuppressive agents.*

#### ***Prenatal Counseling: Aiming for a Successful Pregnancy***

**Tara Miller, NP, Duke University, Durham, NC, USA**

*The speaker will discuss contraception, risks, alternatives, genetic counselling, infertility treatments and options.*

#### ***Surveillance and Management of Rejection During Pregnancy***

**Ersilia DeFilippis, MD, Columbia University Irving MC, New York, NY, USA**

*The speaker will discuss monitoring of immunosuppression, non-invasive diagnostic testing to identify rejection, management of rejection, and risk of infection.*

#### ***Outcomes of Pregnancies involving a solid organ recipient***

**Francesca Macera, MD, Hôpital Erasme, Brussels, Belgium**

*The speaker will review complications after pregnancy for both the organ recipient and child.*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### What's New? Updates to the ISHLT Guidelines for the Care of Heart Transplant Recipients

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pathology, Pediatrics, Pharmacy, Research & Immunology

**Session Summary:** The 2010 ISHLT Heart Transplant Guidelines were a landmark achievement. These guidelines recently underwent revision to incorporate the changing landscape. New topics include but are not limited to pre-transplant optimization for rejection surveillance and treatment updates in multiorgan transplant. This session will highlight this guideline update and changes and additions.

**Session Chairs:** Eugene DePasquale, MD, and Marta Farrero, MD

#### **Overview of the Guideline Process**

**Angela W. Velleca, RN, BSN, MHDS, CCTC, Cedars-Sinai Heart Institute, Los Angeles, CA, USA**

*The speaker will present an overview of the guideline process and task forces.*

#### **Task Force 1 - Peri-Operative Care of the Heart Transplant Recipient: What's New?**

**Estela Azeka, MD, University of Sao Paulo, Sao Paulo, Brazil**

*The speaker will discuss the updates and additions to Task Force 1.*

#### **Task Force 2 - Immunosuppression and Rejection: What's New?**

**Michael Shullo, PharmD, University of West Virginia, Morgantown, WV, USA**

*The speaker will discuss the updates and additions to Task Force 2.*

#### **Task Force 3 - Heart Transplant Long-Term Care Complication Management: What's New?**

**Kyung-Hee Kim, MD, PhD, Sejong General Hospital, Seoul, South Korea**

*The speaker will discuss the updates and additions to Task Force 3.*

#### **Task Force 4 - Heart Transplant Long-Term Care Prevention and Prophylaxis: What's New?**

**Howard Eisen, MD, Penn State Hershey Medical Center, Hershey, PA, USA**

*The speaker will discuss the updates and additions to Task Force 4.*

#### **Panel Discussion**

## SUNRISE SESSION (60 minutes)

### Who's Keeping Score? Risk Scoring Systems and Contemporary Risk Factors for Primary Graft Dysfunction in Heart Transplantation

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery

**Session Summary:** Despite recent advances in heart transplantation, Primary Graft Dysfunction (PGD) is the leading cause of mortality early after transplant. Identifying patients at high risk for PGD remains a clinical challenge. While several risk scoring systems have been introduced, there remains significant debate about the most clinically meaningful risk factors. Multiple risk scores will be presented and there will be discussion of the pros and cons of each unique PGD risk scoring systems. The need to include specific risk factors as part of future risk scores will also be discussed.

**Session Chairs:** Luciano Potena, MD PhD, and Asvin Ganapathi, MD

**Risky Business: Primary Graft Dysfunction and Risk Modeling**

Javier Segovia, MD, PhD, Hosp Puerta De Hierro, Madrid, Spain

*The speaker will describe the individual components and rationale of RADIAL, PREDICTA, and ABCE scores for PGD. A review of the elements of each score and a description of the advantages and disadvantages of each scoring system will be addressed.*

**The Rise of the Machines: PGD Risk Scoring Systems in the MCS Bridge to Transplant Population**

Lauren K. Truby, MD, Duke University Medical Center, Durham, NC, USA

*The speaker will describe the current risk scoring systems specific to the MCS bridge to transplant population, and argue that specific risk scores should be developed for patients bridged with MCS in the contemporary era.*

**Danger Zone: How to Risk Stratify DCD Donors for Primary Graft Dysfunction**

Simon Messer, MD, Papworth Hospital, Cambridge, United Kingdom

*This speaker will discuss how future risk scores need to take into account DCD donors, and review outcomes of PGD in recipients of DCD donors.*

**Demystifying Vasoplegia after Heart Transplant: Predictor or Consequence of Primary Graft Dysfunction?**

Fabiana Marcondes-Braga, MD, PhD, Heart Institute Hospital, Sao Paulo, Brazil

*The speaker will describe risk factors for Vasoplegia, and review differences in outcomes when comparing PGD to Vasoplegia post heart transplantation.*

**The Age of Artificial Intelligence (AI): Novel Primary Graft Dysfunction Risk Scores Using Machine Learning**

Yas Moayed, MD, University Health Network, Toronto, ON, Canada

*The speaker will describe risk factors and scoring system developed as part of the International Consortium on PGD founded in 2019 using machine learning. The PGD Consortium includes 12 international centers with over 3000 recipients.*

**Panel Discussion**

## SUNRISE SESSION (60 minutes)

### DCD Heart Transplantation and Ex Vivo Repair: Gift Box or Pandora's Box?

Primary Core Therapy: HEART  
Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: LUNG, MCS  
Secondary Audiences: Cardiology, Pathology, Research & Immunology

**Session Summary:** DCD (donation after circulatory death) heart transplant is emerging as a novel method with great potential to expand the donor pool. However, specific techniques are required and long term results are currently unavailable. Furthermore, ex vivo heart perfusion can be used as a research model for therapies including gene therapy and regeneration/repair.

**Session Chairs:** Julia Riebandt, MD, and Marian Urban, MD

#### **Technical Aspects of DCD Heart Transplantation**

**Stephen R. Large, MB MA MS F, Papworth Hospital, Cambridge, United Kingdom**

*The speaker will discuss the technical aspects of DCD heart transplantation including the use of ex-vivo heart perfusion platforms.*

#### **Comparison of Outcomes After DCD and DBD Heart Transplantation**

**Sarah E. Scheuer, MD, St Vincent's Hospital, Sydney, Australia**

*This speaker will discuss and compare outcomes after DCD heart transplantation vs. DBD heart transplantation.*

#### **Tips and Tricks to Set Up a DCD Heart Transplantation Program**

**Kumud K. Dhital, BM.BCh, FRCS-CTh, FRACS, PhD, Sparsh Hospital, Bangalore, India**

*This talk will focus on ethical and logistical challenges in setting up a DCD heart program with special emphasis on Normothermic Regional Perfusion (NRP). Geographical differences will be discussed. Useful tips and tricks on how to initiate conversation with a local procurement organization and how to approach the transplant team, will be discussed in detail. Current clinical experience, outcomes, and future directions will be reviewed.*

#### **Heart in a Box as a Platform for Molecular and Cellular Research**

**Linda Van Laake, MD PhD, University Medical Center Utrecht, Utrecht, Netherlands**

*This speaker will discuss how ex-vivo heart perfusion can also be applied to develop and study innovative treatments for heart repair such as gene therapy, small molecules to stimulate proliferation, stem cells, reactivate circadian clock, and more.*

#### **Panel Discussion**

## SUNRISE SESSION (60 minutes)

### Survival of the Best Prepared: Strategies to Prevent Frailty and Deconditioning Before and After Cardiothoracic Transplantation

Primary Core Therapy: HEART

Primary Audience: Nursing and Allied Health

Secondary Core Therapies: LUNG, MCS

Secondary Audiences: Cardiology, Cardiothoracic Surgery, Pediatrics, Pharmacy, Pulmonology, Research & Immunology

**Session Summary:** Maximizing physical functioning both before and early after cardiothoracic transplant is crucial for better long-term survival and quality of life. This session will focus on prehabilitation and postsurgical rehabilitation for the heart or lung transplant candidates and recipients from a multidisciplinary point of view. It will review and evaluate evidence on strategies to prepare and optimize all elements of the prehabilitation and rehabilitation experience including physical strength and exercise capacity and lessening of frailty parameters. Evidence of impact of such strategies on posttransplant outcomes will be reviewed. Critical questions such as the optimal timing and intensity of these intervention strategies will be considered. Implications of the evidence for clinical practice and referrals for prehabilitation and rehabilitation will be discussed.

**Session Chairs:** Christiane Kugler, NA, and Kristjan Karason, PhD

#### **Assessments and Interventions to Reduce Frailty: an Overview**

**Bruno Schnegg, MD, St. Vincent's Hospital, Sydney, Australia**

*This talk will give an overview of pre-transplant frailty, including incidence and assessments of frailty. The aim of this presentation is also to focus on strategies to reduce the adverse effects of pre-transplant frailty.*

#### **Stay Ahead: The Importance of Moving on the Waitlist**

**Maria-Angeles Castel, MD, PhD, Hospital Clinic, Barcelona, Spain**

*This talk will focus on the logistics of establishing and running a successful prehabilitation program for cardiothoracic transplant candidates.*

#### **Healthy at Home: Home-Based Rehabilitation After Lung Transplantation**

**Sarah Wright, PT, Massachusetts General Hospital, Boston, MA, USA**

*This talk will focus on the importance of developing rehabilitation models that are feasible and sustainable outside the hospital and specialized rehabilitation settings. Furthermore, COVID-19 has shown the importance of having treatment opportunities that can be offered remotely.*

#### **HIT with a New Heart: High-Intensity Interval Training After Heart Transplantation**

**Katrine Rolid, PhD, Oslo University Hospital, Oslo, Norway**

*High-intensity interval training (HIT) after heart transplantation is an evolving field. HIT has shown beneficial effects on exercise capacity in maintenance heart transplant recipients, but it remains a novel approach in the de novo recipients. This talk will focus on the main effects of HIT and strategies to implement HIT in clinical practice.*

#### **Panel Discussion**

## SUNRISE SESSION (60 minutes)

### From the Ground Up: Developing Lung Transplant Programs When Resources are Limited

Primary Core Therapy: LUNG

Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: NONE

Secondary Audiences: Nursing and Allied Health, Pulmonology

**Session Summary:** This symposium will focus on establishing and delivering lung transplant services in resource-limited settings and developing countries. We will present an overview of challenges, solutions, and outcomes of programs in these settings. Examples will be presented from Turkey, Brazil, Korea, and southeast Europe.

**Session Chairs:** Anh Nguyen, MD, PhD, and Unmil Shah, MD

#### ***An Overview of Lung Transplant Programs in Developing Countries***

**Anh Nguyen, MD, PhD, Vietnam National Lung Hospital, Hanoi, Viet Nam**

*This presentation will consider challenges, examples of good practice, and outcomes of lung transplantation in resource-limited settings and developing countries.*

#### ***The Future of Lung Transplantation in Turkey: Addressing the Factors Limiting Progress***

**Erdal Yekeler, MD, University of Health Science, Ankara, Turkey.**

*In Turkey, lung transplantation as a therapy for end-stage lung disease has become accepted practice over the past decade. This presentation will consider the challenges that contribute to low donor lung availability in Turkey and how transplant clinicians have sought to overcome these challenges.*

#### ***Building a Lung Transplant Program in Brazil: Challenges in Resource-Limited Settings***

**Paulo Pego Fernandes, MD, Hospital das Clinicas da Faculdade de Medicina da Universidade de Sao Paulo, Sao Paulo, Brazil**

*Lessons learned during the 30 year journey of building a leading lung transplant program in Brazil will be shared, highlighting the importance of developing and maintaining a professional team of personnel with national leadership and international engagement.*

#### ***Lung Transplantation in Korea: Developing a New Collaborative Registry as a Way Forward***

**Jin Gu Lee, MD, PhD, Yonsei University College of Medicine, Seoul, South Korea**

*The Korean Organ Transplantation Registry (KOTRY) has been used to collate national lung transplant data since 2015. This presentation will review the inception of this web-based national registry and the role of the registry in shaping organ allocation strategy, monitoring clinical outcomes and driving research.*

#### ***Launching Lung Transplantation Programs in Southeast Europe: the Benefit of Trans-National Cooperation***

**Walter Klepetko, MD, Medical University of Vienna, Vienna, Austria**

*An example of partnership and mentoring to support surgical and medical expertise, the establishment of organizational and structural frameworks and the avoidance of pitfalls related to a new program.*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### Challenges in Pediatric Lung Transplant: What Learning Can We Impart to Our Adult Colleagues?

Primary Core Therapy: LUNG

Primary Audience: Pediatrics

Secondary Core Therapies: NONE

Secondary Audiences: Nursing and Allied Health, Pathology, Pharmacy, Pulmonology, Research & Immunology

**Session Summary:** Lung transplantation is seldom performed in children, and there are only few “high”-volume centers. This symposium will discuss challenges of providing longitudinal care for pediatric lung transplant patients and explore novel tools available for assessment of pediatric lung allograft function, with a goal to highlight concepts that are also applicable to adult lung transplantation.

**Session Chairs:** Nicholas Avdimiretz, MD, FRCPC, and Christian Benden, MD FCCP

#### ***Assessing Kids for Transplantation: When is the Right Time and How Do We Know?***

**Helen Spencer, MD, Great Ormond Street Hospital, London, United Kingdom**

*This session will discuss strategies to ensure that the underlying lung disease diagnosis is correct, assessment of whether all non-transplant treatment options have been exhausted, and how to prepare the patient and their family for transplantation. Special attention will be given to discussion of morbidity and mortality with or without transplantation.*

#### ***Novel Methods for Assessing Lung Disease: from PFTs to Imaging Modalities***

**Marc G. Schecter, MD, University of Florida, Gainesville, FL, USA**

*The speaker will discuss the latest diagnostic advances to assess lung disease in children, such as infant pulmonary function tests, hyperpolarized gas MRI and other imaging modalities.*

#### ***CLAD in Pediatrics versus Adult Populations: What To Do When PFTs Aren't an Option***

**Christian Benden, MD, MBA, FCCP, University Hospital Zurich, Zurich, Switzerland**

*This lecture will discuss approaches to clinical assessment of lung allograft function in pediatric patients when spirometry may not be reliable. Specific attention will be given to the use of biomarkers to predict CLAD (such as cell free DNA) and CLAD diagnostics including markers of lung function (such as lung clearance index).*

#### ***Challenges in Rejection Diagnostics in Pediatric Transplant and How to Overcome Them***

**Kathryn Wikenheiser-Brokamp, MD, PhD, Cincinnati Children's Hospital, Cincinnati, OH, USA**

*This talk will highlight common problems in histological rejection diagnosis with special emphasis on the definition of a good biopsy on the background of limited surgical material. This lecture will provide a short overview of current ACR classification, diagnostic pitfalls and available markers to predict outcome. It will also discuss HLA monitoring, diagnostic criteria for AMR and its distinction from infection.*

#### ***Transitioning to Adult Services: How the Patient-Centered Multidisciplinary Team Approach in Pediatric Transplant May Benefit Adult Centers***

**Ernestina Melicoff-Portillo, MD, Baylor College of Medicine, Houston, TX, USA**

*This talk will discuss how a multi-disciplinary team of clinicians, social workers, child life therapists, and others are essential to providing unified care to pediatric organ recipients. This session will also discuss how a comprehensive team approach can facilitate transitions of care from pediatrics to adult transplant centers, including discussion of the patient/parent dynamic.*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### Gastrointestinal Issues in the Lung Transplant Recipient

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: NONE

Secondary Audiences: Cardiothoracic Surgery, Nursing and Allied Health, Pharmacy

**Session Summary:** This symposium will discuss the diagnosis and management of gastrointestinal diseases in lung transplant recipients specifically discussing gastroesophageal reflux disease (GERD), liver disease, nutrition, and cystic fibrosis (CF) modulator therapy for extrapulmonary disease including gastrointestinal disease.

**Session Chairs:** Angela Koutsokera, MD, PhD, and Sameep Sehgal, MD

#### ***CFTR Modulator therapy for Gastrointestinal (GIT) Disease Post-Lung Transplant***

**Alice L. Gray, MD, University of Colorado, Aurora, CO, USA**

*CF transmembrane conductance regulator (CFTR) modulator therapy in the post lung transplant setting is controversial. Evidence is rapidly expanding regarding the use of CFTR modulators for extrapulmonary disease in CF. This presentation will review the evidence and provide recommendations for the use of such therapies in the post lung transplant recipient with a focus on GIT concerns.*

#### ***The Burning Question of Reflux***

**Matthew G. Hartwig, MD, Duke University Medical Center, Durham, NC, USA**

*The speaker will discuss diagnosis, phenotyping, impact on outcomes, and management strategies personalized to the specific GERD phenotype including connective tissue disease. Management options including medical management, radiofrequency ablation to the lower esophageal sphincter, magnetic sphincter augmentation, transoral incisionless fundoplication, and gastric bypass will be considered. The speaker will focus on timing of intervention and impact on outcomes.*

#### ***When Not to Go It Alone: When is Liver Replacement Necessary?***

**Fabio Ius, MD, Hannover Medical School, Hannover, Germany**

*The assessment of patients with respiratory failure with concurrent liver disease is challenging. This presentation will cover assessment tools inclusive of liver biopsy, fibroscan and functional testing to determine when concurrent or staged liver transplantation is required.*

#### ***Beyond BMI: the Assessment and Management of Nutritional Status Post-Lung Transplant***

**Donna Hickling, B.Health Sc (Nutrition & Dietetics), Grad Cert, The Prince Charles Hospital, Brisbane, Australia**

*This presentation will discuss assessment of nutrition status in lung transplant recipients and management strategies in malnourished recipients, including pharmacological appetite stimulants and supplemental feeds.*

#### ***Panel Discussion***



## SUNRISE SESSION (60 minutes)

### The Long and Short of It: Telomeres in Lung Transplantation

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: NONE

Secondary Audiences: Infectious Diseases, Pathology, Pharmacy, Research & Immunology

**Session Summary:** This symposium will detail the relevance of short-telomere syndromes pre- and post-lung transplant, with a focus on patients with pulmonary fibrosis.

**Session Chairs:** John Mackintosh, MBBS, and Hilary J Goldberg, MD

#### ***Short Telomere Length as a Marker of Biological Aging***

**Bart M. Vanaudenaerde, KU Leuven, Leuven, Belgium**

*This presentation will consider telomere dynamics in healthy aging and disease, with a focus on the role of telomerase dysfunction in critical telomere shortening, cellular senescence, development of a pro-inflammatory microenvironment and ultimately organ dysfunction.*

#### ***Assessment and Management of Patients with Short Telomeres Being Considered for Lung Transplantation***

**Daniel Chambers, MBBS, MRCP, FRACP, MD, The Prince Charles Hospital, Brisbane, Australia**

*Short-telomere syndromes are multisystem disorders; however, systemic dysfunction may only be revealed by immunosuppression. This presentation will consider the role of screening for short telomeres, extra-pulmonary phenotyping, multidisciplinary consultation, and pre-transplant immunosuppression challenge protocols for risk stratification of potential transplant candidates.*

#### ***Is Donor Telomere Length Relevant to the Recipient?***

**Andrew Courtwright, MD, PhD, University of Pennsylvania, Philadelphia, PA, USA**

*Understanding donor telomere physiology may enable more nuanced donor utilization. This presentation will discuss the significance of donor allograft telomere length in airway and donor peripheral blood mononuclear cells, post-transplant telomere attrition and outcomes following lung transplantation.*

#### ***Management and Outcomes of Patients with Short Telomeres After Lung Transplantation***

**Sofya Tokman, MD, Norton Thoracic Institute, Phoenix, AZ, USA**

*This presentation will discuss personalized immunosuppression strategies and long-term monitoring for specific complications associated with short telomere syndromes including airway complications, metabolic diseases and malignancy. The impact of recipient telomere shortening on prognosis will also be considered.*

#### ***Telomeres and Cytomegalovirus Risk in Lung Transplant Recipients***

**Paolo A. Grossi, MD, PhD, University of Insubria, Varese, Italy**

*Impaired CMV immunity may be a systemic manifestation of telomere-mediated disease. This presentation will discuss risk assessment and strategies to reduce post-transplant CMV morbidity including graft selection by CMV serostatus, CMV prophylaxis and treatment options including adoptive transfer of CMV-specific T-cells.*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### The Path Forward in Developing Novel Therapies in Lung Transplantation

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: HEART

Secondary Audiences: Cardiology, Cardiothoracic Surgery, Nursing and Allied Health, Pathology, Pharmacy, Research & Immunology

**Session Summary:** Advances in immunosuppression have contributed to improved post-transplant survival. Immunosuppression agents in current use have been approved in kidney or liver before being studied and approved for cardiothoracic transplantation. This symposium will discuss clinical trials for immunosuppression, including novel endpoints such as biomarkers. In addition, regulatory considerations and a proposed path forward will be considered.

**Session Chairs:** Mingyao Liu, MD, PhD, and Adam Cochrane, PharmD, MPH

#### ***Improving Clinical Trial Design in Lung Transplantation***

**Ramsey Hachem, MD, Washington University SoM, St. Louis, MO, USA**

*This talk will consider how to define the goals and objectives of early-phase immunosuppression clinical trials, to gain the most knowledge with the fewest patients placed at risk. Later stage clinical trials will be discussion with consideration of adaptive trial design.*

#### ***Is Rejection the Best Endpoint? Where Do We Stand on Biomarkers as Endpoints?***

**Stijn Verleden, PhD, University of Antwerp, Leuven, Belgium**

*Immunosuppression clinical trials have traditionally adopted the endpoint of rejection. However, current immunosuppression is effective at preventing cellular rejection in many patients and chronic rejection is a highly variable process, such that larger sample sizes are needed in lung transplant. Importantly, biomarkers associated with rejection may serve as endpoints for immunosuppressive drug development, which could limit number of patients and time to endpoints.*

#### ***Removing Impediments to Clinical Trial Success: A Regulatory Body View***

**TBD**

*This talk will address the regulators' role in drug innovation, providing early support for trial design, fostering collaboration across national and international regulatory networks and with academia, and taking into account incentives for so called "orphan medicines".*

#### ***Where Does This Leave Us? Where Do We Go From Here?***

**Paul A. Corris, MB FRCP, Freeman Hospital, Newcastle Upon Tyne, United Kingdom**

*Now that the information has been presented, where do we go from here? Is there a specific unified path that ISHLT can take to advocate for immunosuppression trials in thoracic transplant?*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### COVID-19 Lessons Learned: Immunology and Pathology in Cardiothoracic Transplant Recipients

**Primary Core Therapy:** LUNG

*Primary Audience:* Research & Immunology

**Secondary Core Therapies:** HEART

**Secondary Audiences:** Cardiology, Infectious Diseases, Pathology, Pulmonology

**Session Summary:** In response to the COVID19 pandemic, research institutions focused heavily on coronavirus biology leading to insights with important implications for solid organ transplantation. This bench to bedside symposium will describe the spectrum of morphologic findings and recent advances in our understanding of testing, lung fibrosis, complement activation, immunity, and myocarditis in the context of COVID-19, as they apply to heart and lung transplant recipients.

**Session Chairs:** David Hwang, MD, PhD, and Francesca Lunardi, MD, ScD, PhD

#### **Advanced COVID-19 Diagnostics**

**Margaret M. Hannan, MD, Mater Hospital, Dublin, Ireland**

*This talk will describe novel diagnostic approaches to testing for SARS-CoV-2 infection and immune responses including nucleic acid, metagenomic, antigen, and serology testing and the impacts of emerging variants. Novel approaches to improve speed and accuracy will be described.*

#### **COVID-19 Lung Pathology**

**Anja C. Roden, MD, Mayo Clinic, Rochester, NY, USA**

*This talk will describe COVID-19-related histopathologic findings in lung explants and allograft biopsies, SARS-CoV-2 testing in formalin fixed paraffin embedded tissues, and findings from single cell sequencing studies in COVID-19 explants, with a goal of better understanding of COVID-19 pathogenesis.*

#### **COVID-19 Cardiac Pathology**

**Carolyn Glass, MD PhD, Duke University Medical Center, Durham, NC, USA**

*This talk will examine COVID-19-related findings in heart explants and allograft specimens, with a focus on the pathogenesis of COVID-19 myocarditis.*

#### **Complement Activation in COVID-19 and Transplant**

**Hrishikesh S. Kulkarni, MD, MSCI, Washington University, St. Louis, MO, USA**

*Severe COVID-19 has been associated with complement activation, which can be directly triggered by viral structural proteins. Such pathology can mimic complement activation from antibody-mediated rejection or primary graft dysfunction. This talk will explore lessons learned from complement activation following SARS-CoV-2 and their implications for diagnostics and therapeutics in transplant recipients.*

#### **Collateral Damage: Autoimmunity and Heterologous Immunity in COVID-19**

**Mark Snyder, MD, University of Pittsburgh, Pittsburgh, PA, USA**

*Immune defects, such as type I interferon autoantibodies, may delay control of viral replication and drive severe COVID-19 infection. This talk will explore the shared risk factors for immune defects between transplant recipients and subjects with severe COVID19 and address how cross-reactivity between SARS-CoV-2-specific immune responses could drive allograft rejection.*

#### **Panel Discussion**

## SUNRISE SESSION (60 minutes)

### How to Heal a Broken Heart: Using Durable VADs to Promote Myocardial Recovery

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pharmacy

**Session Summary:** Heart failure remission is the pinnacle of cardiovascular care for end-stage cardiomyopathy in adult and pediatric patients. The cohort of VAD patients that achieve myocardial recovery generates immense interest. All aspects of the VAD patient's journey from decompensated heart failure to recovery will be discussed. Unique challenges exist in care delivery for these patients. Understanding and recognition of the potential for myocardial recovery can improve patient outcomes and potentially avoid cardiac transplantation.

**Session Chairs:** Wandy Chan, PhD, FRACP, and Matthew Lander, MD

#### ***Physiologic Underpinnings of Myocardial Recovery Across All Ages***

**Filio Billia, MD, PhD, Toronto General Research Institute, Toronto, ON, Canada**

*This talk will focus on emerging data on myocardial recovery in adult and pediatric patients supported by ventricular assist devices and, in particular, outlining current innovative bench research and the impact of mechanical unloading on the cardiomyopathic ventricle.*

#### ***Pushing the Boundaries with Medical Therapy in Durable VADs: Promoting Myocardial Recovery?***

**Caitlin Dadhania, PharmD, Tufts Medical Center, Boston, MA, USA**

*This presentation will focus on "current" and future medical/neurohormonal therapy to promote myocardial recovery. Several 'new' drugs (ARNI, SGLT2i etc) are now part of our armamentarium to treat patients with heart failure but there is a paucity of data available in patients supported with VADs. Where should we be looking next in medical therapy for long term mechanically supported patients? How should we be monitoring for recovery?*

#### ***Tapping Into the Fountain of Youth: Myocardial Recovery in Children***

**Martin Schweiger, MD, PhD, Children's Hospital Zurich, Zurich, Switzerland**

*The speaker will review what is currently known about bridge to recovery in children. Challenges and limitations to recovery in children will be discussed and potential strategies to address these and promote increased recovery will be proposed.*

#### ***Purge the Device or Keep It In? Handling the Question of LVAD Explant***

**Evgenij Potapov, MD, German Heart Institute, Berlin, Germany**

*This presentation will focus on the surgical aspects of explanting or decommissioning a durable device. What are the pros and cons of the different surgical approaches and technical considerations? Do age and size of patient matter? The talk will cover examples of cases where the strategy was supremely successful, to cases that contributed to the "learning curve" of the unit.*

#### ***Post-Recovery: Now What?***

**Stavros G. Drakos, MD, PhD, FACC, University of Utah SoM, Salt Lake City, UT, USA**

*What are the medical management considerations post recovery: with "partial recovery" and VAD still in; or "full recovery" with VAD explant or decommission? This lecture will discuss the risks of heart failure recurrence, survival outcomes and monitoring strategies for this group of patients.*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### Partners in Crime: The Right Ventricle and Pulmonary Hypertension in MCS

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART, LUNG, PVD

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pharmacy, Pulmonology

**Session Summary:** Right heart failure (RHF) remains frustratingly common after LVAD implant. Understanding the complex interplay between the right ventricle (RV) and the pulmonary circulation, particularly in the presence of pulmonary hypertension (PH) is critical to understanding RHF. This session will feature the latest research on right ventricular hemodynamics and physiology, the interactions between the RV and pulmonary circulation with LVAD support, and the impact of PH on outcomes for patients with LVADs. Experience with MCS for the systemic right ventricle in Fontan circulation will also be reviewed.

**Session Chairs:** Kiran K Mirza, MD, and Gaurav Gulati, MD

#### ***Right Ventricular Reserve in Advanced Heart Failure and Pulmonary Hypertension***

**Olaf Mercier, MD, PhD, Marie Lannelongue Hospital, Paris, France**

*This talk will discuss novel ways to assess right ventricular function and functional reserve using exercise testing, and how these techniques may be used to detect subclinical RV dysfunction, better phenotype patients with pulmonary hypertension, and improve prognostication.*

#### ***Brief Q&A***

#### ***Lessons Learned: Early versus Late RV Failure After LVAD Implantation***

**William Hiesinger, MD, Stanford University, Palo Alto, CA, USA**

*This talk will discuss the occurrence, risk factors and effect on prognosis of RV failure early versus late after LVAD implant.*

#### ***Brief Q&A***

#### ***Wrong or Right Ventricle? Lessons from the Growing Experience with VADs in the Fontan Circulation***

**David Peng, MD, University of Michigan, Ann Arbor, MI, USA**

*This talk will review the latest data on durable VAD use and outcomes in patients with Fontan circulation. Fontan-specific strategies to address implantation, fenestrations, collaterals, speed optimization, and other quandaries will be discussed.*

#### ***Brief Q&A***

#### ***Treating Pulmonary Hypertension on MCS***

**Maja Cikes, MD, PhD, University of Zagreb School of Medicine, Zagreb, Croatia**

*This talk will review the latest data on treatment of pulmonary hypertension for patients with LVADs. Indications for treatment, therapeutic modalities, and expected results will be discussed.*

#### ***Brief Q&A***

## SUNRISE SESSION (60 minutes)

### The Right to MCS: Are We Still Allowed To Say NO?

Primary Core Therapy: MCS

Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: HEART, LUNG

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Nursing and Allied Health

**Session Summary:** Short-term mechanical circulatory support (MCS) has become a routine approach for acute heart failure. Based on improved MCS techniques, extended survival has led to many patients in need of heart transplantation or left ventricle assist device (LVAD) implantation. However, the referring system for transition from temporary MCS to LVAD is burdened with a reduced LVAD availability. This symposium will focus on current patients' access to short-term MCS and LVADs and solutions to overcome disparities.

**Session Chairs:** George Makdisi, MD, MPH, MS, and Jodie Lantz, MSN, APRN, PCNS-BC

#### ***A Life After ECMO Is (Not) Possible: When Nobody Wants Your Patient***

**Silvia Mariani, MD, Hannover Medical School, Hannover, Germany**

*This presentation will focus on the experience of peripheral centers which are able to acutely support patients with temporary mechanical circulatory support but they have to refer their patients to other centers for LVAD implantation. The presentation will highlight the difficulties of these centers in the management of ECMO patients after the LVAD centers refuse to implant the patients.*

#### ***A Life After ECMO Only As Destination Therapy***

**Alessandro Barbone, MD, PhD, Humanitas Research Hospital, Rozzano, Italy**

*This lecture will discuss the perspective of all those centers able to perform ECMO and LVAD implantation but not heart transplantation. The presentation will focus on hybrid models where LVAD implantation is decentralized for destination therapy patients and centralized for bridge to transplant patients.*

#### ***A Life After ECMO Is (Always) Possible: The Perspective of an LVAD and Transplant Center***

**Udo Boeken, MD, University of Düsseldorf, Düsseldorf, Germany**

*This lecture will provide the point of view of the center able to provide LVAD implantation and heart transplantation. The speaker will suggest solutions to improve communication between peripheral ECMO center and LVAD/transplant center and offer more support to all ECMO centers on the territory.*

#### ***When the Doctor Says NO: Ethical Implications of a Difficult Choice***

**Shunichi Nakagawa, MD, Columbia University Medical Center, New York, NY, USA**

*This lecture will investigate the ethical implications after the LVAD and/or transplantation center refuses the patients and the caregiver has to decide when to stop treatments. The focus will be on disparities in treatment access and implications for the whole treatment process for acute heart failure.*

#### **Panel Discussion**

## SUNRISE SESSION (60 minutes)

### Keep it Less Complicated: Minimizing and Treating Complications in LVAD Patients - From Bleeding to Infection

Primary Core Therapy: MCS

Primary Audience: Pharmacy and Pharmacology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pathology, Pediatrics

**Session Summary:** This symposium will review commonly encountered complications in LVAD patients, including the pathophysiology and management of gastrointestinal (GI) bleeding and intracranial hemorrhage after LVAD implantation. This session will explore the pathophysiology of VAD bleeding and the association between infection and coagulopathy. This session will also discuss prevention and management of bleeding and infections in LVAD recipients.

**Session Chairs:** Jaime-Juergen Eulert-Grehn, MD, and Valentina Stosor, MD

#### ***AVMs and Other Mechanisms Associated With GI Bleed After LVAD Implantation***

**Oksana Volod, MD, Cedars Sinai Medical Center, Los Angeles, CA, USA**

*This presentation will describe the pathophysiology associated with GI bleeding after LVAD implantation including AVM formation, platelet dysfunction, and acquired vWF deficiency. A description of endoscopic evaluation and intervention for GI bleed in LVAD recipients, as well as recommendations for holding/managing antiplatelet and anticoagulation therapy at time of endoscopy/enteroscopy, will be included. The speaker will expand on role of pre-operative temporary MCS on acquired VWD. Potential targets for interventional or pharmacologic intervention will be introduced.*

#### ***Stop the Bleeding: Pharmacologic Interventions for GI Bleed After LVAD***

**Sara Strout, PharmD, Johns Hopkins, Baltimore, MD, USA**

*This presentation will describe pharmacologic therapies for prevention and management of GI bleed after LVAD, including review of mechanisms of action, risks/benefits, and supporting literature for various agents such as ACEi/ARB, omega-3, octreotide, danazol, tamoxifen, thalidomide, and others. The speaker may also review factor products and other reversal agents for acute bleeding.*

#### ***Mitigating Strategies to Prevent Infections in Durable VADs***

**Stephanie Pouch, MD, Emory University SoM, Atlanta, GA, USA**

*Infection remains a significant cause of morbidity and mortality in patients reliant on MCS. This presentation will provide an overview of risk factors for infection in adult and pediatric LVAD patients. The speaker will address strategies to prevent VAD infections, including selection of perioperative antimicrobial prophylaxis and approaches to driveline management for both adult and pediatrics.*

#### ***From Early Treatment of Driveline Infections to Late Treatment Considerations to Manage Central LVAD Infections: What Do VAD Centers Need to Know?***

**Alexander M. Bernhardt, MD, University Heart Center Hamburg, Hamburg, Germany**

*More than one-third of LVAD patients experience infection, and management strategies must take into account site and severity of infection. The speaker will outline an approach to the clinical evaluation of patients with VAD infection and treatment strategies for driveline and centralized infections. Considerations regarding transplant listing will also be addressed.*

#### ***The Domino Effect: Risk Factors and Risk Mitigation Strategies for Hemorrhagic Strokes in LVAD Recipients***

**Sern Lim, MD, Queen Elizabeth Hospital, Birmingham, United Kingdom**

*Hemorrhagic stroke is an Achilles heel of LVAD use. This talk will discuss risk factors, including bloodstream infections and anticoagulation alongside their association with an increased risk of neurologic complications in VAD recipients. This presentation will address risk factors and mitigation strategies for prevention of hemorrhagic stroke.*

#### ***Panel Discussion***

## SUNRISE SESSION (60 minutes)

### Rookies and Sages: The International Pulmonary Hypertension Challenge

**Primary Core Therapy:** PVD

*Primary Audience:* Pulmonology

**Secondary Core Therapies:** HEART, LUNG, MCS

**Secondary Audiences:** Cardiology, Cardiothoracic Surgery, Infectious Diseases, Pediatrics

**Session Summary:** Pulmonary hypertension is a complex condition with challenges in differential diagnosis and management. It is often difficult to confirm the diagnosis of pulmonary arterial hypertension (a rare disease) in patients who present cardiac and/or respiratory comorbidities. Assessment of severity is mandatory to determine the therapeutic strategy. The art of risk stratification is complex. This case-based interactive session will put junior faculty and experts under the spotlight: live challenge ahead! Four cases will be presented by junior faculty, followed by comments from experts in the field. Each case presenter will prepare questions for their paired expert discussant to address.

**Session Chairs:** Oksana Shlobin, MD, and William Auger, MD

#### ***Is This Really Idiopathic Pulmonary Arterial Hypertension?***

**Julie Wacker, MD, University Hospital of Geneva, Geneva, Switzerland**

*Presentation of a case initially diagnosed as IPAH in a pediatric patient, highlighting the pitfalls in making this diagnosis in the pediatric population.*

#### ***Expert Discussant***

**Erika B. Rosenzweig, MD, Columbia University Medical Center, New York, NY, USA**

*Expert will discuss the case presentation describing IPAH in a pediatric patient, and further discuss the pitfalls in making this diagnosis in the pediatric population.*

#### ***Brief Q&A***

#### ***BPA for Residual Pulmonary Hypertension Post PEA for CTEPH***

**Julien Guilhaire, MD, PhD, Marie Lannelongue Hospital, Le Plessis-Robinson, France**

*This case presentation will highlight the role of Balloon Pulmonary Angioplasty (BPA) post Pulmonary Endarterectomy (PEA) for residual PH.*

#### ***Expert Discussant***

**Joanna Pepke-Zaba, MD, Royal Papworth Hospital, Cambridge, United Kingdom**

*Expert will discuss the case presentation and the role of BPA post PEA for residual PH.*

#### ***Brief Q&A***

#### ***Telehealth and Remote Monitoring in Pulmonary Arterial Hypertension***

**Sandeep Sahay, MD, Houston Methodist Hospital, Houston, TX, USA**

*This case will illustrate the challenges of monitoring patients with PAH at a distance and introduce the role of remote monitoring.*

#### ***Expert Discussant***

**Raymond L. Benza, MD, The Ohio State University, Columbus, OH, USA**

*Expert will discuss the case presentation and describe the role and pitfalls of telehealth in the management of PAH and the role of remote monitoring.*

#### ***Brief Q&A***

#### ***Pulmonary Arterial Hypertension and COVID-19***

**Nichole Sisserson, MMS, PA-C, Inova Advanced Lung Disease and Transplant Program, Falls Church, VA, USA**

*This case will describe the presentation and outcome of COVID-19 pneumonia in a patient with PAH.*

#### ***Expert Discussant***

**John Granton, MD, University of Toronto, Toronto, ON, Canada**

*Expert will discuss the case presentation and describe the outcomes in patients who contract COVID-19 with an underlying diagnosis of PAH.*

#### ***Brief Q&A***



## SYMPOSIUM SESSION (90 minutes)

### Cancer, Advanced Heart Failure, and Heart Transplant: Do Any of My Cells Work Properly?

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS

Secondary Audiences: Cardiothoracic Surgery, Nursing and Allied Health, Pathology, Pediatrics, Pharmacy, Research & Immunology

**Session Summary:** In recent years, cardio-oncology has emerged as a clinically relevant topic in day-to-day practice for the heart failure community. This session will highlight key issues including the management of acute LV dysfunction, understanding the risk of myocarditis from immune checkpoint inhibitors (ICIs), balancing risk/benefit of ICIs in heart transplant (HTX) patients, and considerations for MCS. The interplay between cancer and HTX in the candidate selection phase and after transplant will be discussed.

**Session Chairs:** Richard K Cheng, MD, and Carmela Tan, MD

#### ***Curing Cancer, Causing Heart Disease: Acute Cardiac Dysfunction From Cancer Treatment***

**Anju Nohria, MD, MSc, Brigham & Women's Hospital, Boston, MA, USA**

*This talk will provide high-yield take-home points regarding specific cancer therapies that can result in significant acute cardiac dysfunction. Acute cardiotoxicity from anthracyclines, cyclophosphamide, HER2 targeted therapies, VEGF inhibitors, proteasome inhibitors, and tyrosine kinase inhibitors will be reviewed. Novel considerations with immunotherapy and risk for immune-related adverse cardiac events will be discussed.*

#### ***Developing Cardiomyopathy After Cancer Treatment: A New Journey Begins***

**Kirsten Rose-Felker, MD, UPMC Children's Hospital of Pittsburgh, Pittsburgh, PA, USA**

*This talk will discuss risk for long-term cardiomyopathy after cancer treatment in both childhood and adult survivors, when to consider this cohort for advanced therapies, and specific considerations when selecting advanced therapies. Specific considerations during selection of advanced heart failure therapies, such as acceptable recurrence-free survival rates and mitigating frailty, in both pediatric and adult patients will be discussed.*

#### ***Leveraging Pathology and Molecular Tools to Aid in Heart Donor and Recipient Cancer Risk Assessment***

**Jan von der Thüsen, MD, PhD, Erasmus MC, Rotterdam, Netherlands**

*This talk will focus on how pathology can aid in donor risk assessment when the donor is a cancer survivor or an individual with localized, low-grade cancer. Can we consider the use of a donor organ from a patient with active localized, low-grade cancer? What about donors with a remote history of cancer - is there concern for delayed cardiotoxic effects? Is there a role for cell-free DNA in screening donors for unidentified cancers or in screening recipients who receive organs from donors with history of cancer?*

#### ***Immunotherapy: What Do Transplant Providers Need to Know?***

**Jayant Raikhelkar, MD, Columbia University Medical Center, New York, NY, USA**

*Immune checkpoint inhibitors (ICIs) are increasingly being used in cancer treatment; however ICIs are associated with a 1% risk of fulminant myocarditis and 50% mortality when myocarditis occurs. The speaker will review the pathophysiology of ICI-related fulminant myocarditis and discuss the diagnosis and treatment strategies for ICI-related fulminant myocarditis in the non-heart transplant patient. Risks and benefits for the specific use of ICIs in the post-heart transplant recipient will also be addressed.*

#### ***Heart Transplantation and Cancer: What is the Risk?***

**Neha Bansal, MD, Children's Hospital at Montefiore, Bronx, NY, USA**

*This talk will focus on cancer recurrence risk assessment during the HTX selection process and in the long-term after HTX. Outcomes data for heart transplant patients with a history of cancer will be presented. The talk will present a framework for considering how long patients must be cancer recurrence free prior to HTX and will address these questions: Do low risk cancers, such as prostate cancer, require a recurrence free interval prior to HTX? Do induction regimens or immunosuppression require modification? Is there an increased risk of cancer recurrence or secondary malignancy after heart transplant?*

#### ***A Balancing Act: Unique Challenges of Cancer in MCS Patients***

**Farooq H. Sheikh, Medical Doctor, MedStar Heart and Vascular Institute, Washington, DC, USA**

*Given that prognosis is improving in patients after cancer treatment, is there an evolving role of durable MCS in this cohort? This talk will discuss considerations for LVAD use in patients with a history of chemo-induced cardiomyopathy. Outcomes for MCS will be reviewed and discussed with attention to the risk of RV failure, bleeding, thrombosis, and infection. The talk will also discuss whether LVAD therapy can be used in patients with active cancer to support them through treatment.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Developments in CAV Imaging and Diagnosis: Time for an Update to the Guidelines?

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: NONE

Secondary Audiences: Pediatrics, Research & Immunology

**Session Summary:** In Cardiology, there are major developments in invasive as well as non-invasive imaging modalities to detect coronary artery disease. However, up until now, the transplant community does not use the full potential of these imaging modalities in the detection of Cardiac Allograft Vasculopathy (CAV). Should non-invasive imaging become a gatekeeper for invasive imaging and can it help to study disease progression? Is it time for a new guideline for CAV definitions as well as CAV surveillance? These questions will be explored in this symposium.

**Session Chairs:** Livia Goldraich, MD, and Steven Kindel, MD

#### ***Stress Echocardiography versus CT for CAV Surveillance: Time to Switch?***

**Stefan Roest, MD, Erasmus MC, UMC Rotterdam, Rotterdam, Netherlands**

*Up until now, most centers screen patients for CAV with the help of stress echocardiography. However, the sensitivity and specificity of this imaging modality is low. Moreover, hospitals are hesitant to use CT for CAV surveillance given the high heart rate of heart transplant recipients. However, is this justified? This talk will demonstrate the utility of CT scans for CAV surveillance and its potential to identify high risk patients in an early stage.*

#### ***Microvascular Assessment of CAV: PET versus CMR versus Cath-IMR***

**Robert J.H. Miller, MD, FRCPC, University of Calgary, Calgary, AB, Canada**

*Microvascular disease is common in patients with CAV and could be a sign of disease progression in patients without macrovascular disease. However, microvascular disease assessment remains difficult. In the last few years, developments in both invasive as well as non-invasive imaging modalities have improved microvascular assessments. This talk will discuss microvascular assessment of CAV by PET scans, cardiac MRI and IMR using coronary angiography.*

#### ***Non-Imaging Based Evaluation for CAV Progression Risk***

**Guillaume Coutance, MD, PhD, Groupe Hospitalier Pitié-Salpêtrière, Paris, France**

*This talk will discuss a risk stratification method to predict CAV progression based on clinical, functional, structural, and immunological variables in both the donor and recipient. By determining an individual's CAV trajectory, one can identify both low- as well as high-risk patients to stratify subsequent CAV surveillance strategies (less imaging or only non-invasive imaging in low risk patients and more frequent or invasive imaging in high risk patients).*

#### ***DEBATE: Intracoronary Imaging Should Be the New Gold Standard for Defining CAV***

*The CAV definitions are in need of an update given the developments in imaging modalities lately. Especially with the introduction of intracoronary imaging, it has been debated whether the definition should be altered. However, not every center has intracoronary imaging possibilities and there is a risk of complications during both OCT and IVUS. Should intracoronary or coronary angiography be the new gold standard for defining CAV?*

**PRO:** Sharon Chih, MD, MBBS, PhD, FRACP, University of Ottawa Heart Institute, Ottawa, ON, Canada

*This speaker will defend the position that intracoronary imaging should be the new gold standard for defining CAV.*

**CON:** Marco Masetti, MD, PhD, University of Bologna, Bologna, Italy

*This speaker will defend the position that coronary angiography should be the gold standard.*

**Debate Rebuttals (5 mins each)**

**Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Don't Lose Heart, as Better Times are Ahead: COVID-19 from Bench to Bedside

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: LUNG, MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pediatrics, Pulmonology, Research & Immunology

**Session Summary:** This symposium, focusing on the current pandemic caused by the SARS-CoV-2 virus, will target specific issues in patients with chronic heart/lung disease, cardiothoracic transplant, mechanical circulatory support or pulmonary vascular disease.

**Session Chairs:** Yael Peled, MD, and Jon A Kobashigawa, MD

#### ***Risk Factors and Severity of COVID-19, Reducing the Risk of Infection and SARS-CoV-2 Testing***

**Marta Farrero, MD PhD, Hospital Clinic, Barcelona, Spain**

*The speaker will discuss risk factors for COVID-19: increasing age, gender (male), comorbidities (heart failure, hypertension, diabetes mellitus, cancer, renal disease, and chronic respiratory diseases). Measures to reduce the risk of infection will be discussed. The speaker will review the recommendations regarding testing for SARS-CoV-2, quarantine/isolation, and proactive monitoring for asymptomatic patients.*

#### ***Management of COVID-19 Patients with Chronic Heart/Lung Disease, Cardiothoracic Transplants, Mechanical Circulatory Support or Pulmonary Vascular Disease***

**Luciano Potena, MD, PhD, University of Bologna, Bologna, Italy**

*The speaker will discuss COVID-19 directed therapies with focus on pharmacodynamic and drug interaction considerations for thoracic transplant/PH/VAD patients, clinical outcomes and prognosis.*

#### ***SARS-CoV-2 Vaccination in Heart Transplantation***

**Jonathan Hand, MD, Ochsner Medical Center, New Orleans, LA, USA**

*The speaker will review the response to SARS-CoV-2 mRNA-based vaccines in solid organ transplant recipients. The speaker will also present specific recommendations for SARS-CoV-2 vaccination: Timing of SARS-CoV-2 vaccination, choice of SARS-CoV-2 vaccine, serological testing, and prioritization.*

#### ***Deceased Donor and Recipient Selection for Cardiothoracic Transplantation During the COVID-19 Pandemic***

**Kim Anderson, MD, Dalhousie University, Halifax, NS, Canada**

*The speaker will discuss pre-transplant testing for deceased donors, pre-transplant testing for cardiothoracic candidates, and criteria for proceeding with cardiothoracic transplantation based on various COVID-19 related clinical scenarios.*

#### ***Transplantation and VAD Implantation During the COVID-19 Pandemic***

**Jignesh K. Patel, MD, PhD, Cedars Sinai Heart Institute, Los Angeles, CA, USA**

*The speaker will discuss the complex aspects of transplantation and mechanical support implantation during the pandemic: potential benefits and risks for the patient; capacity to provide the necessary post-operative and outpatient care to allow for a successful transplant outcome; risk of ongoing community exposure; risk of mortality if not transplanted; and the adequate and fair allocation of resources.*

#### ***ECMO Support During the COVID-19 Pandemic: Challenges and Recommendations***

**Diyar Saeed, MD, PhD, Leipzig Heart Center, Leipzig, Germany**

*The speaker will discuss considerations for extracorporeal membrane oxygenation (ECMO) during the pandemic (limited hospital capacity and judicious usage of this resource-intensive mode of support), inclusion/exclusion criteria, cannulation process issues, and ongoing care on ECMO. A review of worldwide experience and local guidelines will also be addressed.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### The Future is Multimodal: Imaging the Transplanted Heart for Rejection, Dysfunction and Vasculopathy

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: NONE

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Research & Immunology

**Session Summary:** Heart transplant is a definitive therapy in end-stage heart failure. Rejection and coronary allograft vasculopathy limit survival. Endomyocardial biopsy and coronary angiography are the gold standard for diagnosis and surveillance but limited in value by sampling error, interobserver variability, and differ in use among centers. Multimodality imaging lacks the inherent risks of invasive tests but the ideal test should be highly sensitive and specific, reproducible and cost efficient. This symposium will help disseminate fundamentals of these techniques, introduce the advanced platforms, outline research priorities, and promote efficient allocation of resources.

**Session Chairs:** Jerry Estep, MD, and Fatima I Lunze, MD, PhD

#### ***Niche to Mainstream- Contemporary Strain Imaging and Deformation Analysis in Post-transplant Surveillance***

**Nadia Fida, MD, Houston Methodist Hospital, Houston, TX, USA**

*This talk will review the current state of heart transplant rejection, its surveillance and diagnosis with advanced echocardiographic techniques. Contemporary studies suggest that these novel techniques are not only valuable in serial graft functional assessment but also in long term risk stratification and predicting major cardiac events and all-cause mortality. The talk will focus on routine surveillance for allograft function as well as advanced imaging techniques as it pertains to acute rejection and allograft function.*

#### ***Precision and Accuracy of T1 Mapping in Allograft Rejection: Ready for Prime Time?***

**Shinichi Nunoda, MD, PhD, Tokyo Women's Med Univ, Tokyo, Japan**

*Acute rejection remains among the most common complications in the first year after transplantation for which endomyocardial biopsy remains the gold standard for diagnosis. T1 mapping detects interstitial edema and fibrosis, which are important markers of acute and chronic rejection. Recent studies have shown that this technique is highly sensitive with excellent interobserver reproducibility and holds promise to be a routine noninvasive method of cardiac allograft rejection surveillance.*

#### ***PET Myocardial Blood Flow: Revolutionizing the Detection and Prognostication of Allograft Vasculopathy***

**Lisa Mielniczuk, MD, University of Ottawa Heart Institute, Ottawa, ON, Canada**

*This talk will review the present-day landscape of cardiac allograft vasculopathy (CAV), its detection by noninvasive techniques, and strengths and weaknesses of each modality. Cardiac PET is showing promise not only in CAV diagnosis and risk stratification in early post-transplant but in prognostication with serial follow up.*

#### ***IVUS vs OCT for Allograft Vasculopathy: Which Can Brave the Achilles Heel of Heart Transplant!***

**Anna Kydd, BMedSci, MBChB, MD, Papworth Hospital, Cambridge, United Kingdom**

*Coronary angiography remains the gold standard for surveillance of coronary artery vasculopathy but lacks sensitivity and specificity. Transplant community has been looking into more accurate methods of CAV assessment that can offer evaluation of the arterial wall structure and thickness in addition to luminal images. The aim of the talk is to review the current findings derived from the analysis of CAV by optical coherence tomography (OCT) and intravascular ultrasound (IVUS) along with physiological assessment with the use of the fractional flow reserve.*

#### ***Breaking from Tradition: Post-Transplant Surveillance Made Simple with AI (Artificial Intelligence)***

**W. H. Wilson Tang, MD, Cleveland Clinic Foundation, Cleveland, OH, USA**

*Artificial intelligence has the potential to predict complications and rejection post-heart transplant. Further translational projects are under development at major centers, with proof of concepts demonstrating validity and safety in the clinical setting.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Heart, Liver, MCS, Oh My! Walking Down the Yellow Brick Road with Adult Congenital Heart Disease Patients

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: LUNG, MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pulmonology

**Session Summary:** Adult congenital heart disease patients are a growing population that are a higher surgical risk group for heart and or heart/lung or heart-multiorgan transplants. In addition, the timing and ability to provide mechanical support to be able to bridge to transplant has many unknowns. This session will review some of the challenges in adult congenital patients, including prognostication in advanced heart failure, surgical considerations and mechanical support to successfully bridge patients to a transplant.

**Session Chairs:** Arvind Bhimaraj, MD, and Hikaru Matsuda, MD

#### ***Changing Landscape of Adult Congenital Heart Disease: Need for Advanced Therapies***

**Ari M. Cedars, MD, Johns Hopkins, Baltimore, MD, USA**

*As the number of individuals with adult congenital heart disease increases, their early surgical correction and hearts with defects could fail needing replacement strategies. This presentation will describe the scope of the need in order to prepare the advanced heart failure community to care for these patients.*

#### ***How to Identify Advanced Heart Failure in Adult Congenital Heart Patients***

**Rose Tompkins, MD, Cedars-Sinai Medical Center, Los Angeles, CA, USA**

*Advanced heart failure criteria have been better defined recently in heart failure but do not capture adult congenital heart disease patients. The speaker will address the challenges of identifying how to risk prognosticate and identifying when to consider advanced therapies.*

#### ***Surgical Complexities and Consideration for Transplant in Adult Congenital Heart Patients***

**Francis Fynn-Thompson, MD, Boston Children's Hospital, Boston, MA, USA**

*Adult congenital heart disease patients have anatomical complexities and surgical risks that are unique to this cohort of individuals. The lecture will elicit special considerations that surgical teams need to keep in mind while planning a heart transplant or mechanical support.*

#### ***When to Consider Heart/Liver Transplant in Fontan Patients***

**Sharon Chen, MD, MPH, Stanford University, Stanford, CA, USA**

*Fontan patients often have liver dysfunction due to passive congestion. This talk will discuss the criteria to consider heart alone versus heart/liver transplantation.*

#### ***Durable Mechanical Circulatory Support for Adult Congenital Heart Disease***

**Fabrizio De Rita, FRCS, Freeman Hospital, Newcastle Upon Tyne, United Kingdom**

*Durable MCS support for patients with complex adult congenital anatomy is a difficult area for solutions. Both physiological and anatomical considerations are important to consider as mechanical support evolves to a viable option for these cohort of patients. This lecture will describe the current experience of durable MCS in adult congenital end stage heart failure patients and discuss the challenges that need to be addressed.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### HLA and Non-HLA Donor Specific Antibodies in Heart Transplantation: It is Time to Look for The Forest Beyond The Trees

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS

Secondary Audiences: Cardiothoracic Surgery, Nursing and Allied Health, Pathology, Pediatrics, Pharmacy, Research & Immunology

**Session Summary:** Patients with preformed or de novo donor-specific antibodies (DSA) are frequently identified as high-risk patients. There is increasing interest in patients with non-HLA DSA but their significance, optimal management, and prognostic implications is unclear. This symposium will describe recent advances in monitoring, diagnosis, and emerging treatment options for patients with HLA and non-HLA DSA in a variety of clinical settings.

**Session Chairs:** Georgina Waldman, PharmD, and María F Renedo, MD

#### ***Nuts and Bolts of HLA Donor-Specific and Non-HLA Antibodies—Past, Present and Future: from No Problem to Nightmare***

**Maria-Nieves Sanz, PhD, University Hospital of Bern, Bern, Switzerland**

*Donor-specific HLA antibodies (DSAs) contribute to antibody-mediated rejection, acute cell-mediated rejection and cardiac allograft vasculopathy after heart transplant. A number of heart transplant patients present with AMR in the absence of DSAs, suggesting antibodies against non-HLA antigens may be associated with an increased risk of AMR and poor outcomes during follow-up. This talk will highlight the principal characteristics and immunology of HLA and Non-HLA antibodies.*

#### ***Is it Time to Start Testing for Non-HLA Antibodies in Heart Transplantation?***

**Elaine Reed, PhD, UCLA Medical Center, Los Angeles, CA, USA**

*Panels of non-HLA antigens may be useful to support clinical decision making as part of the protocols for noninvasive monitoring and for biopsy interpretation. This talk will discuss new technologies including Molecular Microscope and ddcfDNA that may help shed light into the relevance of these antibodies and the immunologic-pathologic correlation.*

#### ***Main Considerations for Clinical Practice: Antibody Characteristics and Clinical Relevance***

**Javier Carbone, MD, PhD, Hospital General Universitario Gregorio Marañón, Madrid, Spain**

*While clinical relevance of HLA DSA has been established, there is evolving data to suggest that certain characteristics including timing of development, strength and class of DSA may be of particular importance. The clinical relevance of non-HLA antibodies and non-specific antibodies is poorly characterized although data is evolving. Worldwide longitudinal analysis is needed to determine the role of preformed and/or de novo HLA and non-HLA antibodies in rejection and long-term graft outcome.*

#### ***What's New in Immunologic Therapies for Highly Sensitized Candidates for Heart Transplant: The Who, When and How***

**Jill Krisl, PharmD, Houston Methodist, Houston, TX, USA**

*This talk will review who, when and how to treat the highly sensitized candidates for heart transplant, peri-transplant management, strategies for desensitization, emerging therapies and sensitization considerations as criteria to guide listing for heart transplant.*

#### ***Deep Dive on Current Concepts and Future Challenges: New Approaches to Management of HLA and Non-HLA DSA In Special Populations***

**Christine S. Falk, PhD, Hannover Medical School, Hannover, Germany**

*This talk will highlight the most relevant topics of this issue and will provide an overview of the current and novel therapies for the management of donor specific antibodies identified in mechanical circulatory support, re-transplant and pediatric patients.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Relative Contraindications to Heart Transplantation: Where is the Line?

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pathology, Pharmacy, Research & Immunology

**Session Summary:** This session will review essential relative contraindications for heart transplant candidacy based on ISHLT 2016 guidelines. Controversial subjects such as vaping, cannabis and HIV will be discussed with lessons learned from all of transplantation. How much does age and weight really matter? Recipient risk factors and the role of donor selection will be reviewed. Finally, we will discuss sensitized patients with focus on international differences and improved outcomes.

**Session Chairs:** Inna Tchoukina, MD, and Andreas Zuckermann, MD

#### **VAPING, NICOTINE and CANNABIS: Going Up in Smoke?**

**Eileen M. Hsich, MD, Cleveland Clinic Foundation, Cleveland, OH, USA**

*Internationally, there is wide variation in transplant centers' acceptance of candidates using nicotine and cannabis products. The ISHLT 2016 guidelines consider active tobacco smoking as a relative contraindication to transplantation and do not take a stance on vaping or cannabis. This talk will review the addicting properties of e-cigarettes, e-cigarette or vaping product use-associated lung injury (EVALI), and cannabis use disorder as it relates to transplantation. The talk will also address current practices and standards around the world. Finally, potential strategies to create fairness will be discussed.*

#### **WEIGHT: Balancing the Scales**

**Johan Nilsson, MD, PhD, Skanes University Hospital, Lund, Sweden**

*Extremes of weight have been associated with poor transplant outcomes. However, ISHLT 2016 guidelines do not comment on selection of low BMI candidates. For obese candidates, weight loss is recommended before listing for transplantation yet there is wide variability in practice patterns between programs given limited weight loss options for these patients. The speaker will discuss evidence to support specific BMI recommendations and strategies for successful transplantation including nutritional rehabilitation and recipient-donor matching with predicted heart mass.*

#### **AGE: Happy 70th Birthday! Off You Go**

**Richard Dorent, MD, Agence de la Biomédecine, Saint-Denis, France**

*The ISHLT 2016 heart transplant candidacy guidelines recommend careful selection of patients > 70 years of age but provide no further guidance. The topic of age will be reviewed based on current literature from large databases such as UNOS and ISHLT as well as published single center experiences with septuagenarians. With no data on which patient > 70 years of age is to be considered for transplantation, this review will discuss strategies to reduce poor transplant outcomes by avoiding other high mortality risk factors and pairing of the older candidate with the 'ideal donor'.*

#### **HIV: Is It Time To HOPE?**

**Julie Doberne, MD, PhD, Duke University Medical Center, Durham, NC, USA**

*Few centers offer heart transplantation to patients with HIV cardiomyopathy. However, existing data suggest favorable post-transplant outcomes in this population, with larger body of evidence for other organs. Moreover, there is an opportunity to expand donor pool for these patients by considering HIV-positive donor organs for HIV-positive recipients within the HOPE Act. The speaker will present current status and future directions of cardiac transplantation in HIV-positive population.*

#### **SENSITIZATION: Is There a Sensible Solution?**

**Monica M. Colvin, MD, University of Michigan, Ann Arbor, MI, USA**

*The ISHLT 2016 guidelines suggest prioritization for highly sensitized patients due to difficulty obtaining suitable donors, leading to excessive waiting times and wait list mortality. However, there are international variations in prioritization and management of sensitized patients. This talk will contrast the international differences in prioritization, discuss that despite these differences we are internationally transplanting more sensitized patients with improvement in outcomes based on the most recent ISHLT registry data, and review desensitization strategies.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Revisiting the Status Quo: Changing Paradigms in Routine Heart Transplant Rejection Surveillance

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: LUNG

Secondary Audiences: Nursing and Allied Health, Pharmacy, Pathology, Pediatrics, Research & Immunology

**Session Summary:** Endomyocardial biopsy has been the standard for rejection surveillance. In recent years, noninvasive monitoring technologies have gained momentum. These technologies, including gene expression profiling and cell free DNA, continue to advance in development and use. This session serves to increase understanding of the benefits and limitations to both biopsy and noninvasive monitoring in providing a nuanced and personalized approach for heart transplant recipients.

**Session Chairs:** Jill C Krisl, PharmD, and Finn Gustafsson, MD PhD

#### ***Beyond the Surface: Non-Invasive Diagnostics for Rejection Surveillance***

**Shelley Hall, MD, Baylor University Medical Center, Dallas, TX, USA**

*This talk will discuss the non-invasive technologies we have for rejection surveillance; would include gene expression profiling, donor derived cell free DNA, emerging biomarkers (exosomes, microRNA, microvesicles). This talk will be a broad overview of available literature available and set the stage for subsequent talks.*

#### ***Do Non-Invasive Diagnostic Results Correlate with Histopathological Diagnoses Based on Endomyocardial Biopsy Interpretation?***

**Katharina Wassilew, MD Dr.med. DScmed MHBA, Rigshospitalet, Copenhagen, Denmark**

*This talk focuses on the pathological classification and diagnosis of rejection, pitfalls in differentiating rejection from infection, morphological correlates of circulating HLA and non-HLA DSA, and challenges with interpretation of cfDNA results. Discussion will include the advantages and disadvantages of pathological examination, biopsy-negative AMR, and the utility of endomyocardial biopsy to exclude other pathologies, such as disease recurrence. Finally, the speaker will explore the importance of surgical explant and autopsy pathology as tools of quality assurance.*

#### ***Diagnosis and Clinical Implication of HLA and Non-HLA DSA in Daily Practice***

**Emanuele Cozzi, MD PhD, Padua University, Padova, Italy**

*This talk will focus on the use of HLA and non-HLA antibody screening for the early detection of acute rejection, highlighting the advantages, pitfalls, and limitations in daily practice particularly in the ever growing population of highly sensitized patients.*

#### ***Say Cheese: Use of Imaging in Rejection Surveillance***

**Angeline S. Leet, MD, Alfred Hospital, Melbourne, USA**

*This talk will discuss the role and limitations of diagnostic imaging approaches for heart transplant rejection surveillance, including ultrasound, MRI, and others.*

#### ***Putting It All Together: Integrating Approaches for Rejection Assessment***

**Eugene DePasquale, MD, USC, Los Angeles, CA, USA**

*This talk will discuss the combined use of molecular diagnostic strategies as well as integration with pathology. Discussion will include, but not limited to, combined use of dd-cfDNA and GEP in addition to other available diagnostic strategies for rejection. Interpretation of test results, immunosuppression modification, and future directions will also be discussed.*

#### ***Panel Discussion***



## SYMPOSIUM SESSION (90 minutes)

### Shock in a Box: What We Need to Learn About Heart Failure Cardiogenic Shock (HF-CS)

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: MCS, PVD

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pharmacy

**Session Summary:** Cardiogenic shock is a complex hemodynamic, metabolic and multiorgan failure with high in-hospital mortality. Evidence based guidelines for treatment approaches are limited around the world. The management of this critical setting is challenging and multidisciplinary. This session addresses topics of paramount importance regarding advanced heart failure cardiogenic shock phenotypes and strategies to improve outcomes.

**Session Chairs:** Alejandro Bertolotti, MD, and Maria Dolores Garcia Cosio, MD

#### ***The Standard of Care Across HF-CS Continuum: When Time is Myocardium***

**Maria F. Renedo, MD, Favalaro Foundation Univ Hosp, Buenos Aires, Argentina**

*In this talk will provide an introductory overview of HF-CS, including reviewing the main characteristics of patients with AHF (etiologies, guideline-directed medical therapy (GDMT), admissions, comorbidities, Society for Cardiovascular Angiography & Interventions (SCAI) stages) and the treatment artillery we have to face HF-CS from inotropes/vasoactive agents through acute MCS devices.*

#### ***Tackling the Shock Circle: Implementing an Algorithm for Mechanical Circulatory Support in HF-CS***

**Daniel Kim, MD, University of Alberta, Edmonton, AB, Canada**

*This talk will discuss the decision-making process in defining the right device for the right patient in the right moment. Special focus will be given to indications, (de)escalation and the advantages of a hub/spoke model.*

#### ***When Right is Wrong: Right Ventricular Failure Cardiogenic Shock: Tips and Tricks When the Guilty is Not the Left Side***

**Ioana R. Preston, MD, Tufts Medical Center, Boston, MA, USA**

*The speaker will discuss the current approaches in the management of cardiogenic shock due to right ventricular failure, from drugs to mechanical circulatory support devices.*

#### ***Best Ways to Monitor HF-CS Patients: Invasive and Non-Invasive Monitoring***

**Fernando Bacal, MD, PhD, Heart Institute, University of Sao Paulo, Sao Paulo, Brazil**

*This talk will address the role of Echo-Bedside and Right Heart Catheterization: how to minimize mistakes when using them in different clinical settings. The speaker will highlight the main aspects related to the interpretation of these monitoring techniques during implant decision-making process, running, and weaning from MCS.*

#### ***Rolling in the Deep: A Little Kid Does Not Mean a Little Shock***

**Michal Odermarsky, MD, Skåne University Hosp, Children Heart Center, Lund, Sweden**

*This talk will discuss the main clinical characteristics of pediatric patients with HF-CS. Different approaches and the most important topics in the management of this vulnerable population will be considered, and highlight that pediatric patients aren't just small adults.*

#### ***Working Together to Improve CS Outcome All Around the World: Ongoing Registries, Trials and Future Challenges from an International Perspective***

**Antonio Loforte, MD, PhD, S. Orsola University Hospital, Bologna, Italy**

*Evidence-based guidelines and treatment approaches are limited. This talk will highlight the need for real-world data, algorithms for initiation of MCS, and interdisciplinary care in order to improve outcomes around the world for patients with this deadly condition.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Single, Dual, or Multiorgan Transplant: How Many is Too Much?

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: NONE

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pharmacy, Research & Immunology

**Session Summary:** This session will focus on candidate selection, procurement strategies, surgical techniques, perioperative management, and immunosuppression regimens unique to dual and multiorgan transplant. A comparison of outcomes with respect to survival, rejection, graft function, cardiac allograft vasculopathy and causes of death for patients with single, dual or multiorgan transplant will be provided. Ethical considerations will also be discussed.

**Session Chairs:** Imo A. Ebong, MD, MS, and Emily Granger, MD, MSC

#### ***Epidemiology, Candidate Selection and Listing Criteria in Dual and Multiorgan Transplant***

**Donna Mancini, MD, Mount Sinai Med Ctr, New York, NY, USA**

*This talk will characterize trends in multiorgan transplant highlighting global differences in specific organ combinations including heart/kidney, heart/liver, heart-liver-kidney, and heart/lung transplant. A comparison of the characteristics of recipients of isolated, dual and multiorgan transplants will be provided. The speaker will review the candidate selection process and listing criteria, and will compare the wait list mortality of patients awaiting isolated versus dual or multiorgan transplant.*

#### ***Multiorgan Transplant: Procurement Strategies, Surgical Techniques and Perioperative Management***

**Abbas Ardehali, MD, UCLA School of Medicine, Los Angeles, CA, USA**

*This talk will focus on the principles of multiorgan procurement from the same donor that includes the heart. The speaker will outline surgical techniques and the rationale guiding the order of transplantation for various combinations of heart and other organ transplant. Simultaneous versus sequential transplant techniques will be discussed. Perioperative management will be addressed with an emphasis on possible complications such as primary graft dysfunction and bleeding.*

#### ***Immunosuppression Management and Rejection in Heart Transplant with Other Organs: What is Different from Isolated/Single Heart Transplant***

**Jacqueline Clark, PharmD, Massachusetts General Hospital, Boston, MA, USA**

*Lower rates of acute and chronic rejection have been reported in recipients of multiorgan transplant. This talk will discuss possible mechanisms proposed to explain the reduced rates of rejection in multiorgan transplant recipients, emphasizing that this protective benefit may not be present if organs are derived from different donors and if transplant is not performed simultaneously. The rates of rejection and a comparison of immunosuppressive strategies in isolated heart versus various heart and other organ transplant scenarios will be reviewed.*

#### ***A Comparison of Outcomes: Single, Dual and Multiorgan Transplant***

**Juan Duero Posada, MD, MSc, University Health Network, Toronto, ON, Canada**

*The current mid- and long-term outcomes of multiorgan transplant recipients are similar to that of isolated heart transplant. This talk will compare the outcomes of isolated heart with various combinations of heart and other organ transplant. The speaker will discuss post transplant survival, causes of death, graft function and cardiac allograft vasculopathy, highlighting differences in outcomes when a sequential as opposed to simultaneous multiorgan transplant technique is adopted. How outcomes are affected when organs from different donors are used will also be addressed.*

#### ***Ethical Considerations in Dual and Multiorgan Transplant: How Many is Too Much?***

**Maria Papathanasiou, MD, University Hospital, Essen, Germany**

*Multiorgan transplant has become common but donor organs remain scarce creating problems of equity and utility in organ allocation. This talk will define the concept of equity and utility as it relates to multiorgan transplant, and address ethical considerations that surround multiorgan transplant. The impact of multiorgan transplant on the wait list duration of patients who are concurrently listed for the non-primary organs of multiorgan recipients will be discussed. The benefits of standardization in practices related to multiorgan transplant will be outlined.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Surviving and Thriving After Heart Transplantation: In It for the Long Run!

Primary Core Therapy: HEART

Primary Audience: Cardiology

Secondary Core Therapies: NONE

Secondary Audiences: Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics, Pharmacy, Research & Immunology

**Session Summary:** Prevention and management of long-term post-heart transplant (HT) complications and psychosocial health aspects are critical to achieve durable survival and maintain quality of life (QOL). This session will review and debate predictors of pediatric and adult HT survival, discuss potential new therapies to protect kidneys and prevent cardiac allograft vasculopathy (CAV), explore learning lessons from pediatrics to improve adult outcomes, and individualize risk modification, mental health and QOL throughout the HT journey.

**Session Chairs:** Luise Holzhauser, MD, and Cecilia Folgero, NP

#### **Defining the Goalposts: Threats to Survival and Quality of Life**

**Josef Stehlik, MD, University of Utah SoM, Salt Lake City, UT, USA**

*The speaker will provide a review of ISHLT TTX Registry and other relevant data sources to determine the median survival for adult and pediatric heart transplantation, causes of death and changes in the survival expectations over the eras. Major clinical features associated with long-term success, defined by survival beyond the median, will be reviewed as well as indications for re-transplantation.*

#### **Old Problems, New Solutions: The Potential for New Therapies to Protect Kidneys and Prevent CAV**

**Amanda R. Vest, MBBS MPH, Tufts Medical Center, Boston, MA, USA**

*This talk will review the links between pre-HT and new-onset post-HT diabetes, chronic kidney disease, CAV and graft failure. The potential role for SGLT2 inhibition and GLP-1 agonism to reduce CAV and renal dysfunction will be evaluated, as well as weight loss pharmacotherapy with GLP-1 agonists to promote long-term survival. The speaker will review new observational and clinical trial data regarding lipid lowering strategies including statins, PCSK9 inhibitors and ezetimibe and address the value of a specific LDL target level.*

#### **Learning from the Kids: What Pediatric HT Can Teach Us About Long-Term Survival**

**Joseph W. Rossano, MD, The Children's Hospital, Philadelphia, PA, USA**

*This talk will provide a summary of the evidence regarding long term survival after pediatric heart transplantation, compare standard post-transplant screening and management in pediatric versus adult practice, and identify best practices in the pediatric field that might be relevant for improving outcomes for adult recipients. Next steps in clinical research for further improvement of pediatric heart transplantation outcomes will be discussed.*

#### **Navigating Crossroads: Managing Critical Transition Points with Focus on Psychosocial Stressors and Quality of Life**

**Mary Amanda Dew, PhD, Univ of Pittsburgh Sch Med, Pittsburgh, PA, USA**

*This talk will discuss critical transition points and their potential threats to longevity and QOL. The management of transitioning from pediatric to adult care will be reviewed. The speaker will discuss effects of crossing the one year post-HT mark and what to do when the dust has settled. Strategies on navigating end-of-life-care and decision making in long-term survivors will be outlined. Navigating ESRD, malignancy treatment, and long-term neurological complications such as autonomic dysfunction and impact on QOL will be addressed.*

#### **DEBATE: Protocols, Patient Selection or Pure Luck: We Can Predict Long-term Success Post-Transplant**

*Potential factors predicting long term post-transplant survival and QOL are the focus of this debate to address the question of whether long term survival is dependent upon nuanced patient selection, the clinical and psychosocial management offered after transplantation, or whether success is more random and not predicted by traditional registry data. The speakers are a combination of adult and pediatric heart transplant cardiologists.*

**PRO:** Kiran Khush, MD, MAS, Stanford University, Stanford, CA, USA

*This speaker will maintain that we can predict long-term transplant success. There's much we can control.*

**CON:** Friederike Danne, MD, Deutsches Herzzentrum, Berlin, Germany

*This speaker will maintain that we cannot predict long-term transplant success with strict patient selection criteria and management protocols: It's out of our hands.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### It's Complicated! Psychosocial and Ethical Issues in Pediatric MCS and Transplantation

Primary Core Therapy: HEART

Primary Audience: Pediatrics

Secondary Core Therapies: LUNG, MCS

Secondary Audiences: Cardiology, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pulmonology, Research & Immunology

**Session Summary:** This session will focus on the unique role of ethical and psychosocial challenges in pediatric MCS and transplantation along with their impact on the post-transplant course. Emerging psychosocial risk factors are associated with worse post-transplant outcomes. Review of such factors will occur along with emerging strategies for intervention. This symposium highlights common challenging decisions faced by providers and discusses the impact of multi-disciplinary involvement in difficult medical decision making.

**Session Chairs:** Simon Urschel, MD, and Estela Azeka, MD

***What To Do When the Parents of the VAD/Transplant Candidate are "High Risk"? Ethics of Supporting Families Facing Structural Vulnerabilities***  
**Samantha J. Anthony, PhD, MSW, Hospital for Sick Children, Toronto, ON, Canada**

*This talk will discuss ethical dilemmas encountered when supporting families who are caring for the child with an LVAD or heart transplant. Speaker will discuss the ethical challenges surrounding the maintenance of medical interventions among families experiencing structural vulnerabilities and the implications for decision-making surrounding pediatric VAD and transplant candidacy.*

***Don't Throw Away Your Shot: Vaccine Refusal in Pediatric Transplantation***

**Lara Danziger-Isakov, MD, MPH, Children's Hosp Med Ctr, Cincinnati, OH, USA**

*Pre-transplant vaccination improves post-transplant safety of the patient as well as graft survival, and live virus vaccines cannot be administered post transplantation or may not be as effective. Refusal of vaccinations pre-transplant is often considered a high concern by most pediatric institutions to transplant listing, which has been a significant topic of debate. This will be addressed, as well as the role of vaccination acceptance in VAD evaluations.*

***You Are What You Eat: BMI Considerations in Pediatric Transplant and VAD Patients***

**Carmel Bogle, MD, University of Maryland Medical Center, Baltimore, MD, USA**

*There is mixed data on the post-transplant outcomes in obese pediatric patients (BMI >35). In addition, many syndromes that cause extreme obesity do not affect the heart. Given the mixed literature, obesity is not an absolute contraindication in pediatric heart transplant. However, data continues to emerge about the poor post-transplant outcomes like diabetes, hypertension and cardiac allograft vasculopathy. This talk will address the controversies around listing of a morbidly obese child, as well as the use of VAD therapy to treat heart failure in obese children. The value of implementing a fitness program will also be discussed.*

***Delays Shouldn't Leave Me Behind: Transplantation in Patients with Neuro-Cognitive Impairment***

**Matthew Fenton, MRCPCH, Great Ormond St Hosp Children, London, United Kingdom**

*This speaker will address listing pediatric with neurocognitive impairments, developmental delays and special needs and also touch upon the transplantation of medically and psychosocially complex adults. Decision making around VAD support in this patient population will also be discussed.*

***"The Green Revolution": What To Do When Your Teenage Patient Smokes Pot?***

**Robert Page, PharmD, MS, University of Colorado School of Pharmacy, Aurora, CO, USA**

*This talk will address the dilemma/conundrum of transplant listing of children who smoke marijuana while also exploring the implications of legalized cannabis in certain jurisdictions.*

***When the Team is at Odds: Decision Making Distress and Conflict Among the Advanced Heart and Lung Failure Teams***

**Melissa Cousino, PhD, C.S. Mott Children's Hospital, Ann Arbor, MI, USA**

*Most health care teams face challenges with staff burnout and distress. This may be even more apparent in Transplant medicine. When teams are faced with life and death decisions about patient candidacy, especially young patients with complicating psychosocial factors, team conflict and clinician distress can further complicate decision making. This talk will review the literature on supporting teamwork in difficult decision making, as well as clinician wellness.*

**Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Real Options in Pediatric Heart Transplant: Small Infants, HLA Sensitization, and Non-invasive Rejection Screening

Primary Core Therapy: HEART

Primary Audience: Pediatrics

Secondary Core Therapies: MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Cardiothoracic Surgery, Nursing and Allied Health, Research & Immunology

**Session Summary:** This symposium explores clinical scenarios which pose important clinical and ethical dilemmas to pediatric heart failure/transplant specialists. Treatment of patients in these high-risk situations places a significant burden on health resources, creates a high intensity clinical commitment, is associated with a degree of uncertainty and unpredictability, and can cause moral distress.

**Session Chairs:** Zdenka Reinhardt, MD, and Kevin P Daly, MD

#### ***A Tough Calculation: Determining the Optimal Transplant Listing Window for Patients with Fontan Physiology***

**Laura Delaney, PhD, Kings College London, London, United Kingdom**

*Listing and transplanting Fontan patients at the optimal time is the key to improving transplant outcomes. This can be improved by developing a patient-specific optimal timing rule using a mathematical technique called Real Options Analysis. The proposed model is parsimonious and easy to use for clinicians and it provides an objective means of delineating the boundaries between patients who are too well, but qualify for transplant, and those who need a transplant, but have too many co-morbidities to list for transplant.*

#### ***DCM in Small Infants: Medical Heart Failure Management***

**Aamir Jeewa, MD, Hospital for Sick Children, Toronto, ON, Canada**

*Children with DCM and systolic heart failure who are less than 10 kg present many unique challenges. This talk will discuss the medical management options available in this population. Specific reference will be made to oral heart failure therapy, inotrope use, and nutritional optimization.*

#### ***DCM in Small Infants: PA Band or LVAD Therapy***

**Emma Simpson, BMBS MMedSci MRCPCH, Freeman Hospital, Newcastle upon Tyne, United Kingdom**

*When small infants develop acute decompensated heart failure, treatment options are limited. Even the pediatric specific VADs are difficult to deploy in this group. This talk will describe alternative options, such as PA band, that have been used in these high-risk patients. Patient selection and technical aspects of the surgical treatment options will be discussed.*

#### ***Heart Acceptance Strategies for the Highly Sensitized Candidate: Wait for the Ideal Match or Accept a Positive Crossmatch and Deal with the Consequences***

**Brian Feingold, MD, MS, Children's Hospital of Pittsburgh, Pittsburgh, PA, USA**

*This talk will focus on the waitlist management of the highly sensitized HT candidate. Reference will be made to the option of pre-transplant desensitization, transplantation against a positive crossmatch, or waiting for the perfect match.*

#### ***Don't Go Breaking My Heart: Cell-Free DNA, MRI, and Non-Invasive Imaging as Alternatives to Endomyocardial Biopsy after Pediatric Heart Transplant***

**Justin Godown, MD, Vanderbilt University Medical Center, Nashville, TN, USA**

*The speaker will discuss non-invasive graft surveillance techniques and highlight how these tools can be utilized to limit per protocol endomyocardial biopsy in pediatric heart transplant recipients. The talk will include a discussion of how age at the time of transplant and time post-transplant impact surveillance strategy.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Pets, Plants, & Palatables: When Living Life After Transplant Comes at a Cost

Primary Core Therapy: HEART

Primary Audience: Pharmacy and Pharmacology

Secondary Core Therapies: LUNG

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pediatrics

**Session Summary:** This session will highlight numerous lifestyle associated factors with infectious risks for immunosuppressed patients after thoracic transplant. This will include infection risks, prophylaxis, and management related to certain pets, gardening, and dietary considerations.

**Session Chairs:** Tomoko Kato, MD, PhD, and Tamara Claridge, PharmD, BCPS

***Cat's in the Cradle: Prevention, Diagnosis, and Treatment of Toxoplasma and Bartonella***

Tara Veasey, PharmD, BCPS, Allegheny General Hospital, Pittsburgh, PA, USA

*This presentation will review the infection risks associated with cats, including Toxoplasma gondii and Bartonella henselae. Speaker will review prevention strategies to avoid infection including prophylaxis as appropriate, signs/symptoms to identify infection, and treatment.*

***Just Fly Away: Management of Bird-Related Pathogens***

Cedric Spak, MD, Baylor University Medical Center, Dallas, TX, USA

*This presentation will describe potential infectious risks associated with birds, with a focus on Cryptococcus. Diagnosis of cryptococcal infection by imaging, culture, and/or other modalities will be reviewed. Prevention and treatment strategies will be presented.*

***Old McDonald Had a Farm: Overview of Farm Animal-Related Infectious Risks***

Elena Seminari, MD, Fondazione IRCCS Policlinico San Matteo, Pavia, Italy

*This presentation will review pathogens associated with farm animals and will discuss potential risks for thoracic transplant recipients. Recommendations for avoidance of infection will be presented as well as treatment strategies if infection does occur.*

***Slither: Creepy Crawly Concerns Carried by Reptiles***

Orla Morrissey, MD, The Alfred Hospital, Melbourne, Australia

*This presentation will describe various pathogens that may be transmitted by reptiles. The speaker will discuss signs and symptoms associated with salmonella or other infections. Treatments and prevention will be addressed.*

***Every Rose Has Its Thorn: Uncommon Fungal Pathogens Associated with Plants and Soil***

Maricar Malinis, MD, Yale University School of Medicine, New Haven, CT, USA

*This presentation will review potential fungal pathogens which might be associated with soil, plants, and gardening. There will be a particular focus on unusual and/or difficult to treat fungal pathogens, such as aspergillus, Fusarium, sporotrichosis, mucormycosis, dematiaceous fungi and others. The discussion will include diagnosis and management strategies as well as region-specific antifungal prophylaxis recommendations. There will be less of a focus on Cryptococcus and as this will be covered in another presentation.*

***Forbidden Fruit: Food-Borne Illnesses Following Transplant***

Nicolas Mueller, MD, University Hospital Zurich, Zurich, Switzerland

*This presentation will describe various food-borne pathogens that may be of concern following transplant. The speaker will review what foods should be avoided & what mitigation strategies can be employed. Signs and symptoms of infection will be described as well as management.*

**Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Cut to the Chase: Lung Transplantation from the Operating Room to the ICU

Primary Core Therapy: LUNG

Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: PVD

Secondary Audiences: Anesthesiology & Critical Care, Nursing and Allied Health, Pharmacy, Pulmonology

**Session Summary:** A range of incisional techniques are available to lung transplant surgeons. The techniques differ in the degree of exposure they afford, flexibility for ECMO cannulation or concomitant cardiac procedures, post-operative analgesic requirements, and subsequent respiratory mechanics. This session will discuss the 3 main approaches (clamshell, median sternotomy, and minimal access approaches), their operative characteristics, anesthesia perspective as well as post operative respiratory mechanics of each approach.

**Session Chairs:** Basil Nasir, MBBCh, and Christine Lau, MD

#### ***Clamshell Incision for Lung Transplantation***

**Mani Daneshmand, MD, Emory, Atlanta, GA, USA**

*The speaker will discuss technique, benefits and pitfalls of lung transplantation via clamshell.*

#### ***Median Sternotomy for Lung Transplantation***

**John Dark, MB, FRCS, Freeman Hospital, Newcastle Upon Tyne, United Kingdom**

*The speaker will discuss technique, surgical benefits and pitfalls of lung transplantation via sternotomy.*

#### ***Minimally Invasive Lung Transplantation***

**Pedro Catarino, MD, Cedars Sinai, Los Angeles, CA, USA**

*The speaker will discuss technique, benefits and pitfalls of lung transplantation via anterolateral thoracotomy.*

#### ***Finding the Way In: Transplant After Previous Thoracic Surgery***

**Goran Dellgren, MD, PhD, Sahlgrenska Univ Hospital, Goteborg, Sweden**

*This presentation will discuss risk assessment, operative techniques and challenges to consider in patients with prior chest surgery, focusing on single and bilateral lung transplant after prior lung or heart-lung transplant (including contralateral single lung transplant). Surgical barriers to transplant listing in this context will be discussed.*

#### ***Post-Operative Pain and Analgesic Strategies***

**Theresa Gelzinis, MD, Presbyterian Hospital, Pittsburgh, PA, USA**

*This presentation will consider the impact of the various surgical incisions on post-operative pain and neuralgia. Pain management strategies including use of a multimodal approach, thoracic epidural analgesia, and paravertebral catheter directed regional blocks will be discussed.*

#### ***Respiratory Mechanics After Lung Transplantation***

**Monique Malouf, MD, St Vincent's Hospital, Sydney, Australia**

*This presentation will consider the impact of the various surgical incisions on respiratory muscle function, chest wall mechanics, requirement for ventilatory support and ultimately lung function after transplantation.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Human versus Beast: Advances in Translational Models of Lung Transplant

Primary Core Therapy: LUNG

Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: NONE

Secondary Audiences: Pathology, Pulmonology, Research & Immunology

**Session Summary:** Many fundamental questions of lung transplant disease pathogenesis and optimal donor assessment remain unanswered. Animal models could be used to mimic these processes and investigate underlying mechanisms and therapeutic interventions. Recently, EVOP models have emerged which challenge this assumption. In this session, we aim to critically examine the variety of lung transplant models and discuss how they can be used to improve our mechanistic understanding of lung transplant pathology.

**Session Chairs:** Tereza Martinu, MD, MHS, and Stijn E Verleden, PhD

#### ***Rat Models: A Window of Opportunity***

**Dong Tian, MD, The University of Tokyo Graduate School of Medicine, Tokyo, Japan**

*Rat models are used to probe the entire spectrum of lung transplantation from EVLP to ischemia reperfusion injury and CLAD. Within this talk, the advantages and disadvantages of rat models of lung transplantation will be discussed as well as recent advances made using rat transplant models.*

#### ***Mouse Models: the Golden Standard?***

**Andrew E. Gelman, PhD, Washington University School of Medicine, St. Louis, MO, USA**

*Murine models are most often used because of their the relatively low costs and the opportunities to investigate genetic manipulations. In this talk, different murine models of lung transplant from heterotopic trachea transplant to orthotopic lung transplants will be discussed. Special attention will be given to different mouse strains and procedures used to model various lung transplant outcomes.*

#### ***Xenotransplantation and Beyond***

**Megan Sykes, III, MD, Columbia Center for Translational Immunology, Columbia, NY, USA**

*Less common animals models have been used to understand lung transplant complications. Non-human primate, porcine, and organ-on-a chip models will be reviewed. The goal of this talk is to provide an overview of these less conventional animal models and highlight their utility and potential for major advances in lung transplantation.*

#### ***The Ex-Vivo Lung as an Experimental Mechanistic Model of Transplant***

**Ciara Shaver, MD, PhD, Vanderbilt University Medical Center, Nashville, TN, USA**

*EVLP has emerged as a tool to study the biology of lung injury. This talk will discuss the benefits and potential of using human and porcine lungs as models of transplant-related lung injury disease states, with a focus on understanding mechanisms of lung injury and repair. This talk will also discuss strategies to extend EVLP beyond 24 hours.*

#### ***Clinical Interventions with Ex-Vivo Perfused Lungs***

**Marcelo Cypel, MD, Toronto General Hospital, Toronto, ON, Canada**

*In addition to extending the window for transplant, EVLP has emerged as a tool for pre-transplant clinical interventions. This talk will review existing evidence for EVLP therapeutic interventions, and cover novel interventions on the horizon.*

#### ***How Well Do Animal Models Mimic the Human Condition?***

**Fiorella Calabrese, MD, Univ of Padova, Padova, Italy**

*Although animal and ex vivo models are crucial to improve our understanding of transplant pathophysiology, the question remains how relevant and comparable these are to actual human disease. In this concluding talk, the aim is to compare these different models to the human condition. The speaker will provide an overview of the human pathology followed by an in-depth comparison to the different models.*

#### ***Panel Discussion***



## SYMPOSIUM SESSION (90 minutes)

### Navigating the COVID Pandemic: Clambering into the Lung Transplant Life Raft

Primary Core Therapy: LUNG

Primary Audience: *Infectious Diseases*

Secondary Core Therapies: HEART, MCS, PVD

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Cardiothoracic Surgery, Nursing and Allied Health, Pathology, Pharmacy, Pulmonology, Research & Immunology

**Session Summary:** This symposium will present contemporaneous data on the full spectrum of clinical impact COVID19 has had on thoracic transplantation.

**Session Chairs:** Erik Verschuuren, MD, PhD, and Saima Aslam, MD, MS

#### ***COVID-19 Vaccination and Prevention Strategies***

**Kathleen Murphy, MD, Penn Medicine, Philadelphia, PA, USA**

*The speaker will discuss immune responses and clinical effectiveness in the cardiothoracic transplant setting of monoclonal antibodies, COVID-19 vaccines, and booster doses. The talk will also focus on post-transplant COVID vaccination strategies: timing after transplant, role of altering immunosuppression around vaccine administration, and discussion of pre- versus post-transplant vaccination.*

#### ***It's Not Just the Lungs: Extrapulmonary Manifestations of COVID-19***

**Olivier Manintveld, MD, Erasmus MC, Rotterdam, Netherlands**

*The speaker will discuss COVID-specific extra-pulmonary complications with a particular focus on myocarditis, acute kidney injury, GI and other manifestations in the setting of COVID-19, which could be risk factors when considering lung transplant candidates. Additionally, potential vaccine-associated events that have emerged, including myocarditis and VITT, will be considered.*

#### ***Recipients with COVID-19: When Can/Should We Transplant?***

**Konrad Hoetzenecker, MD, PhD, Medical University of Vienna, Vienna, Austria**

*The speaker will discuss specifics of how to identify patients with severe, unresolving COVID-19-associated ARDS, who may benefit from lung transplantation. Timings relative to infective status will also be considered.*

#### ***Optimization of the COVID-19 Infected Lung Transplant Candidate***

**Erika Lease, MD, University of Washington, Seattle, WA, USA**

*This talk will highlight key peri-operative considerations in these complex patients and the role of the multidisciplinary team in managing comorbidities related to prolonged critical illness (including nutritional deficits, deconditioning, psychological distress) to achieve transplant success.*

#### ***Management of the COVID-19 Infected Lung Transplant Recipient***

**Cameron R. Wolfe, MBBS MPH, Duke University Medical Center, Durham, NC, USA**

*This talk will summarize the recent literature and highlight therapeutic options for the management of COVID+ recipients including post exposure prophylaxis, immunosuppression adjustment, antiviral agents, immunomodulators and neutralizing monoclonal antibodies.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Vaccination in Cardiothoracic Transplant Candidates and Recipients: the Time is Now?

Primary Core Therapy: LUNG

Primary Audience: Infectious Diseases

Secondary Core Therapies: HEART

Secondary Audiences: ALL

**Session Summary:** This session will review the recommended vaccines for cardiothoracic transplant patients, discuss the consequences of immunosuppression on vaccine responses, review new data about specific vaccines in transplant patients, and debate whether completion of recommended vaccines should be required prior to transplantation.

**Session Chairs:** Emily A Blumberg, MD, and Patricia Ging, PharmD

#### ***Vaxxed and Transplanted – Not Just for COVID***

**Haifa Lyster, MSc, Royal Brompton Specialist Transplant Pharmacist, Middlesex, United Kingdom**

*In this presentation, the recommended vaccinations for cardiothoracic transplant candidates and recipients will be reviewed, including recent changes and different options for vaccination schedules.*

#### ***From Cow Pox to COVID: A Brief Overview of Vaccination and the Immunocompromised Host***

**Joanna M. Schaeffer, MD, PhD, UCLA School of Medicine, Los Angeles, CA, USA**

*This presentation will quickly review the history of vaccines and how they provide protection, with a focus on the data behind vaccination pre and/or post-transplant. The patient's ability (or lack) to mount a protective response while on immunosuppression will be discussed, including role of antibodies and T cells. This will include an update regarding COVID vaccine efficacy in this population.*

#### ***New Advances in Transplant Vaccinology: Current and Emerging Vaccines for Transplantation***

**Robin Avery, MD, Johns Hopkins, Baltimore, MD, USA**

*In this presentation, recent data regarding efficacy of vaccination after transplant will be reviewed including risks and benefits of live vs. inactivated vaccinations before or after transplantation and unique vaccine considerations in pediatric transplant candidates. This will include discussion of shingles vaccines and different COVID vaccine formulations.*

#### ***Case Study: Should This Patient's Listing Require Completion of Recommended Vaccination?***

**Michelle Murray, MD, MSc, MRCP, Mater Misericordiae, Dublin, Ireland**

*A clinical case of a patient undergoing transplant evaluation will be presented to set the stage for a debate about vaccine requirements prior to transplant listing. This will facilitate discussion of urgency of transplant listing, acuity of clinical decline, and transplantation for COVID.*

#### ***DEBATE: Transplant Programs Should Mandate Candidates Be Fully Vaccinated Prior to Activation on a Transplant List***

*This topic has been hotly debated in recent times related to the COVID-19 pandemic, when it has assumed greater urgency but its relevance extends beyond the recent pandemic, and is relevant to pediatric and adult programs.*

**PRO: Osnat Shtraichman, M.D, Rabin Medical Center Belinson Campus, Petach Tikva, Israel**

*This speaker will maintain that transplant programs SHOULD mandate candidates be fully vaccinated prior to activation on a transplant list.*

**CON: Olivia S. Kates, MD, University of Washington, Seattle, WA, USA**

*This speaker will maintain that transplant programs should NOT mandate candidates be fully vaccinated prior to activation on a transplant list.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Outside-of-the-Box Immunosuppression for Lung Transplantation

Primary Core Therapy: LUNG

Primary Audience: Pharmacy and Pharmacology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Cardiothoracic Surgery, Nursing and Allied Health, Pulmonology, Research & Immunology

**Session Summary:** This symposium will include evidence behind a spectrum of therapies, when and how to use, as well as benefits and risks associated with treatment. The session will include novel methods of monitoring immunosuppression, the use of belatacept in lung transplantation, basiliximab in non-induction setting, as well as photopheresis, total lymphoid irradiation (TLI), inhaled immunosuppression, and highlight prospective new therapies.

**Session Chairs:** Fay Burrows, BPharm, and Michael Perch, MD

#### **Targeting Personalized Immunosuppression via Novel Monitoring Strategies**

**Peter Jaksch, MD, Medical University of Vienna, Vienna, Austria**

*In routine use, immunosuppressant dosage is led primarily by monitoring of trough levels. Other diagnostic and prognostic markers to assess the individual intensity of immune suppression are lacking. The speaker will discuss potential methods to determine immune function and degree of immunosuppression, such as analysis of the torque teno virus (TTV) load, QuantiFERON Monitor, and ImmuKnow, as well as virus-specific T cells (Tvis).*

#### **Belatacept Use Following Lung Transplantation**

**Cody A. Moore, PharmD, University of Pittsburgh Medical Center, Pittsburgh, PA, USA**

*This presentation will describe the use of belatacept (co-stimulatory blocker) following lung transplantation. The mechanism of action and dosing strategies will be presented. Possible indications, such as renal sparing or DSA suppression, will be discussed. Relevant literature will be reviewed and risks as well as benefits of use will be reported.*

#### **Non-Induction Basiliximab for a Calcineurin Inhibitor (CNI) Holiday**

**Georgina Waldman, PharmD, Massachusetts General Hospital, Boston, MA, USA**

*This presentation will describe potential utility of IL-2 inhibition in a non-induction setting to allow for temporary calcineurin inhibitor (CNI) discontinuation. Pharmacokinetics of basiliximab will be discussed including mechanism of action and dosing strategy. Available evidence will be reported.*

#### **Extracorporeal Photopheresis and Total Lymphoid Irradiation**

**Anna Reed, MBChB, MRCP, PhD, Royal Brompton & Harefield, Harefield, United Kingdom**

*This presentation will discuss the non-pharmacologic immunosuppression strategies of extracorporeal photopheresis and total lymphoid irradiation. Evidence for use as well as mechanisms will be reported. Risks and benefits will be discussed. A particular focus will be made on utility of these therapies if a patient is unable to tolerate standard maintenance immunosuppression.*

#### **Is it Time to Reconsider Inhaled Immunosuppression?**

**Irina L. Timofte, MD, University of Maryland, Baltimore, MD, USA**

*Inhaled immunosuppression offers a theoretical advantage of a low burden of systemic side effects but was previously discounted after a multi-center, randomized trial failed to demonstrate improved CLAD-free survival or overall mortality.*

*This presentation will explore technological advances, murine modelling, and the potential for a new approach to the augmentation of maintenance immunosuppression and the treatment of BOS.*

#### **Future Frontiers in Lung Transplant Immunosuppression**

**Patricia Ging, PharmD, Mater Misericordiae University Hospital, Dublin, Ireland**

*This presentation will discuss the need for new immunosuppressive agents for lung transplantation. The mechanism of action and potential utility of agents such as JAK inhibitors and IL-6 antagonist (tocilizumab) will be discussed. Available data for utilization in solid organ transplant will be described.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Equity and Equality in Cardiothoracic Transplantation: Access to Care

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: HEART, MCS

Secondary Audiences: ALL

**Session Summary:** This session will explore socioeconomic/racial, gender, geography and health insurance factors and their influence on access to /outcomes of advanced therapies (MCS, transplant) in patients with advanced heart and lung disease. It will include perspectives both from the US and international settings. Strategies to help overcome barriers, such as improving patient self-care and health literacy will be reviewed.

**Session Chairs:** Peter M Hopkins, FRACP, and Lynn Punnoose, MD

#### ***Let's Look at Geography: Challenges in Delivering Cardiothoracic Transplant Care in Rural and Remote Settings***

**Aman Sidhu, MD, University Health Network, Toronto General Hospital, Toronto, ON, Canada**

*This lecture will review the demographics and clinical spectrum of heart and lung disease in underserved regions, such as rural and regional areas. It will further explore how geography may affect outcomes after advanced therapies and cardiothoracic transplant.*

#### ***Gender Differences: Do Women Get a Fair Shot in Cardiothoracic Transplant? Are the Rules Stacked Against Them?***

**Miriam Aguilar Pérez, MD, Univ Puerta de Hierro Majadahonda Hosp, Madrid, Spain**

*This talk will focus on gender specific factors that limit candidacy and access to advanced therapies and cardiothoracic transplantation.*

#### ***Socioeconomic and Racial Challenges to the Delivery of Advance Therapies and Transplant in the Setting of Universal Healthcare: Inequalities Beyond Sex***

**Paola Morejon Barragan, MD, Hospital Clínica, Guayaquil, Ecuador.**

*Individuals of lower socio-economic status (SES) have higher risk of developing cardiothoracic disease, lower likelihood of receiving advanced heart and lung failure therapies and worse outcomes following receipt of these therapies. Understanding the impact of SES on outcomes in patients with advanced cardiothoracic disease may help to develop effective and equitable treatment strategies. Here we discuss these issues in a system of universal health care from around the globe.*

#### ***Effect of Health Insurance Status on Pre- and Post-Cardiothoracic Transplant Access to Care and Outcomes***

**Khadijah Breathett, MD, MS, University of Arizona, Tucson, AZ, USA**

*This talk will explore how insurance status influences access to advanced therapies and patient management post transplant and MCS, ranging from measures such as listing rates for transplant, MCS implantation, post transplant patient and graft survival and patient medication adherence.*

#### ***The Unique Aspects of Pediatric Cardiothoracic Transplant Limiting Access to Care***

**Brigitte W. Willemse, MD, PhD, Univ Med Ctr Groningen, Groningen, Netherlands**

*Children may belong to minority racial populations, experience increased waitlist mortality and have increased difficulty in accessing timely donor organ allocation for lung and heart transplant. Is this related to allocation practices or a complex interplay of clinical/socioeconomic factors? This talk will explore these questions and propose actions to reduce these disparities.*

#### ***Show Me Your Dirty Laundry: the Unintended Negative Consequences of Public Performance Reporting and Impact on Access to Cardiothoracic Transplantation***

**Jesse Schold, PhD, Cleveland Clinic, Cleveland, OH, USA**

*This talk will discuss the un-intended negative consequences of public performance reporting among adult and pediatric heart and lung transplant programs, highlighting how it leads to risk averse behavior and decreased listing of high risk recipients.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Improving Quality of Lung Transplant Care: Survival is Only the Beginning

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: NONE

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Research & Immunology

**Session Summary:** Survival is the outcome most commonly used to assess the performance of lung transplant centers. In focusing on short-term effectiveness outcomes, other components of quality assessment can be missed and performance improvement efforts can be limited. More than 300 healthcare quality metrics have been described to date in solid organ transplantation. This session will discuss metrics beyond survival which impact on, or define, transplant success including adherence and engagement, frailty and nutritional status.

**Session Chairs:** Aida Venado, MD, and Meg M Fregoso, MSN, NP-BC

#### ***What is a Relevant Survival Metric After Lung Transplant?***

**Jasvir Parmar, PhD, FRCP, Royal Papworth Hospital, Cambridge, United Kingdom**

*This talk will discuss the pros and cons of the commonly used 1-month, 1-year, and 3-year survival metrics as indicators of quality of care and the role of near-real-time outcome monitoring via program-specific cumulative sum (CUSUM) methodology.*

#### ***How to Define Benefit and Success from Lung Transplant Beyond Survival Tools***

**Joshua Diamond, MD, University of Pennsylvania, Philadelphia, PA, USA**

*This talk will consider global thoughts on how to better define success and techniques for remotely evaluating success.*

#### ***Assessing Physical Functioning Post-Lung Transplant: How, When and Who Benefits?***

**James Walsh, PhD BPhy, The Prince Charles Hospital, Brisbane, Australia**

*This talk will discuss measurements of success in transplant related to the long-term functional status of the recipient including targeted measures of frailty domains and functioning, disability, and health-related quality of life.*

#### ***The Impact of Nutritional State on Post-Transplant Success***

**Marion Seabaugh, MPH, RD, Stanford Health Care, Stanford, CA, USA**

*This talk will discuss challenges in nutrition following transplant and how nutritional interventions can impact post-transplant outcomes.*

#### ***Post-Transplant Medication Adherence as an Outcome and a Risk Factor***

**Fabienne Dobbels, MSc, PhD, Univ Hospital Leuven, Leuven, Belgium**

*This talk will explore how adherence is assessed, enhanced and integrated across the transplant continuum (including through pediatric to adult transition) considering individualized self-management strategies, behavioral interventions and digital connectivity.*

#### ***How to Analyze Psychosocial Benefit for Patients and Caregivers Post-Transplant***

**Melissa Sanchez, BScHons, PGDip, DclinPsy, MSc, Royal Harefield Hospital, Harefield, Middlesex, UK**

*Following lung transplant, depression and anxiety are common, and elevated levels of psychological distress are associated with worse clinical outcomes. This talk will discuss the role for psycho-social support and caregiver engagement to optimize mental and physical health.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Save the Beans: Recognition and Protection of Renal Function in Lung Transplantation

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: NONE

Secondary Audiences: Anesthesiology & Critical Care, Pharmacy, Research & Immunology

**Session Summary:** The kidneys are one of the most commonly affected organs after lung transplantation. This symposium highlights how to better select lung transplant recipients in regards to renal function, protective strategies peri and post-op to decrease the incidence of acute kidney injury, pharmacologic strategies for renal protection, risk factors and management of chronic kidney disease, and the role of renal transplantation in this population. Preserving the lung allograft is of utmost importance, but we must not forget to also "Save the Beans".

**Session Chairs:** Hannah C Mannem, MD, and Sandeep G Attawar, MD

#### ***Into the Looking Glass: Evaluating Renal Function in Pre-Transplant Candidates***

**Timothy Whelan, MD, Med Univ of SC, Charleston, SC, USA**

*A look into what the risk factors are for acute kidney injury/chronic kidney disease development post-transplant, and which testing is best in the pre-transplant population to evaluate renal function. How we can better optimize patients prior to transplant to minimize incidence of kidney injury/chronic kidney disease post-lung transplant will be addressed.*

#### ***Putting Up a Shield: Protective Peri- and Post-Operative Strategies to Prevent Acute Kidney Injury***

**Alberto Benazzo, MD, Medical University of Vienna, Vienna, Austria**

*How do we protect the kidneys during transplant and in the recovery phase? The speaker will provide a review of practice and outcomes both intra-op and post-op during transplant index hospitalization.*

#### ***Clinical and Molecular Epidemiology of AKI and CKD Post-Transplant***

**Michael Shashaty, MD, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA**

*The speaker will review some of the pre-published LTOG data looking into epidemiology of acute kidney injury (AKI) and chronic kidney disease (CKD) post-transplant, along with a review of diagnostic methods (such as renal injury biomarker panels) and phenotyping.*

#### ***Diving Deep: Maintenance Immunosuppression Strategies for Renal Protection***

**Jens Gottlieb, MD, Hannover Medical School, Hannover, Germany**

*The speaker will discuss immunosuppressive strategies to preserve renal function while also preserving the lung allograft.*

#### ***Tricks of the Chronic Kidney Disease Trade***

**Anil Chandraker, MD, MBChB, Brigham & Women's Hospital, Boston, MA, USA**

*The speaker will discuss how to manage chronic kidney disease post-transplant with tricks of the trade from a nephrologist's perspective.*

#### ***To Transplant or Not to Transplant?***

**Miranda Paraskeva, MBBS, FRACP, MD, Alfred Hospital, Melbourne, Australia**

*This presentation will discuss renal transplant for both lung transplant candidates with chronic kidney disease (concurrent versus sequential dual organ transplant) and lung transplant recipients who develop chronic kidney disease. When is the timing right? What are the outcomes?*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Take a Chance on Me: Updates in Lung Transplant Candidate Selection

Primary Core Therapy: LUNG

Primary Audience: Pulmonology

Secondary Core Therapies: NONE

Secondary Audiences: Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pediatrics

**Session Summary:** This session will review the key aspects of the updated ISHLT Consensus document for the selection of lung transplant candidates. Particular emphasis will be placed on the ethical implications, the assessment of risk factors that have now been incorporated into the updated consensus statement, and disease specific updates for referral and listing.

**Session Chairs:** Kathleen J Ramos, MD, MSc, and Caroline M Patterson, MD

#### **Updated Recommendations for Lung Transplant Candidate Selection: Assessment of Risk Factors**

Lorriana E. Leard, MD, UCSF Medical Center, San Francisco, CA, USA

*The updated consensus document for the selection of lung transplant candidates differs from prior versions by proposing categories for risk factors and recognizing that risk factors need to be considered together. This presentation will address the identification and characterization of risk factors and discuss the importance of optimizing potentially modifiable risk factors prior to lung transplantation. This talk will include disease specific recommendations, and a review of the implication of malignancy/pre-existing conditions.*

#### **Psychosocial Considerations in the Selection of Lung Transplant Candidates**

Patrick J. Smith, PhD, MPH, Duke University Medical Center, Durham, NC, USA

*Psychosocial evaluation of lung transplant candidates is an important consideration. This presentation will review the importance of identification and, when possible, optimization of psychosocial risk factors.*

#### **Pediatric Specific Considerations for Lung Transplant Candidate Selection**

Melinda Solomon, MD, FRCPC, Hospital for Sick Children, Toronto, ON, Canada

*This talk will discuss pediatric specific considerations in the selection of pediatric lung transplant candidates. This talk will also focus on some of the potential issues in selection and the eventual transition to the adult transplant programs.*

#### **Infectious Disease Risk Factors in Lung Transplant Candidates**

Silvia V. Campos, MD, Heart Institute of Sao Paulo Medical School, Sao Paulo, Brazil

*The speaker will review our latest understanding of infectious processes that could place lung transplant recipients at risk, including a discussion of multi-drug resistant organisms (non-tuberculous mycobacteria, molds, and Burkholderia cepacia) as well as viral pathogens (HBV, HCV, and HIV).*

#### **Ethical Principles to Guide the Selection of Lung Transplant Candidates and Allocation of Lungs**

Are Holm, MD, PhD, Oslo University Hospital, Oslo, Norway

*The scarcity of donor lungs requires rationing of this limited societal resource. This presentation highlights how the selection of transplant candidates is an ethical choice as well as a medical one. The fundamental ethical principles of utility, justice, and respect for persons as they pertain to selection of lung transplant candidates will be reviewed.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Lung Transplant Biomarkers Now

Primary Core Therapy: LUNG

Primary Audience: *Research & Immunology*

Secondary Core Therapies: NONE

Secondary Audiences: Infectious Diseases, Pathology, Pulmonology

**Session Summary:** Long term survival following solid organ transplantation requires the early detection of rejection pathology that will guide the administration of anti-rejection therapies. This session will discuss novel technologies that promise substantial improvements over current standard of care approaches.

**Session Chairs:** Christine S. Falk, PhD, and Daniel Calabrese, MD

#### ***Donor-Specific T Cell Responses***

**Carla C. Baan, PhD, Erasmus Medical Center, Rotterdam, Netherlands**

*The speaker will discuss technique, benefits and pitfalls of lung transplantation via clamshell.*

#### ***Micro-RNA Dysregulation in Lung Transplant Rejection***

**Alessandro Palleschi, MD, Fondazione IRCCS Ca' Granda - Ospedale Maggiore Policlinico, Milan, Italy**

*The speaker will discuss technique, surgical benefits and pitfalls of lung transplantation via sternotomy.*

#### ***Cell-Free DNA in Lung Transplantation***

**Mark Nicolls, MD, Stanford University, Stanford, CA, USA**

*The speaker will discuss technique, benefits and pitfalls of lung transplantation via anterolateral thoracotomy.*

#### ***Molecular Pathways of Allograft Rejection***

**Kieran Halloran, MD, University of Alberta, Edmonton, AB, Canada**

*This presentation will discuss risk assessment, operative techniques and challenges to consider in patients with prior chest surgery, focusing on single and bilateral lung transplant after prior lung or heart-lung transplant (including contralateral single lung transplant). Surgical barriers to transplant listing in this context will be discussed.*

#### ***Small Airway Rejection: Diagnosis by Cytology Brush***

**John R. Greenland, MD, PhD, U. California SF, San Francisco, CA, USA**

*This presentation will consider the impact of the various surgical incisions on post-operative pain and neuralgia. Pain management strategies including use of a multimodal approach, thoracic epidural analgesia, and paravertebral catheter directed regional blocks will be discussed.*

#### ***Artificial Intelligence Imaging Analysis to Detect Allograft Dysfunction***

**Vibha N. Lama, MD, MS, University of Michigan, Ann Arbor, MI, USA**

*This presentation will consider the impact of the various surgical incisions on respiratory muscle function, chest wall mechanics, requirement for ventilatory support and ultimately lung function after transplantation.*

#### ***Panel Discussion***



## SYMPOSIUM SESSION (90 minutes)

### Body Composition and Durable MCS: Too Obese, Too Cachectic or Just Right - the Goldilocks Dilemma

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pediatrics

**Session Summary:** Patient selection is a key determinant of outcomes for LVAD support. Extremes of patient BMI, and frailty/ sarcopenia need appropriate assessment, and consideration for best management strategy to improve post LVAD outcomes. This session will discuss the emerging tools in diagnosis of sarcopenia/ frailty in patients being evaluated for LVAD, the impact of extremes of BMI on post LVAD outcomes and the optimal management strategy both in adult and pediatric patients.

**Session Chairs:** Eman A Hamad, MD, and Stephan Schueler, MD, PhD, FRCS

#### **Optimizing Nutritional Assessments and Rehabilitation in Pediatric VAD Recipients**

**Amy Kiskaddon, PharmD, Johns Hopkins All Children's Hospital, St. Petersburg, FL, USA**

*The speaker will discuss the unique nutritional challenges that children with end-stage heart failure and VADs face. Approaches to better assessing nutritional status and needs and evidence-based nutritional rehabilitation will be presented.*

#### **How High is Too High? LVAD Outcomes in High BMI Patients**

**Norihide Fukushima, MD, PhD, National Cerebral and Cardiovascular Center, Suita, Japan**

*There is a high prevalence of obese patients with advanced heart failure who would benefit from LVAD therapy across all age groups. However, the outcomes association with extreme body mass index in LVAD patients and specific cut-offs has not been well established. The BMI cut off is center dependent and the data is limited. The speaker will discuss implications of extremes of weight on LVAD outcomes and current evidence to support specific BMI recommendations, and outcomes of those successfully bridged to heart transplantation in adult and pediatric patients.*

#### **Changes in Weight Post LVAD: Ups and Downs, and How Do We Manage? Bariatric Surgery in LVAD Recipients**

**Amy E. Hackmann, MD, UT Southwestern Medical Center, Dallas, TX, USA**

*Many advanced heart failure patients are not considered for heart transplant due to their elevated BMI and an LVAD is placed as an alternative with the goal of losing weight and eventually being bridged to heart transplant. With that said, most pediatric and adult patients gain weight after LVAD. There are no guidelines in regards to medical or surgical weight loss in LVAD patients. The speaker will discuss a multidisciplinary approach that includes bariatric surgery, and the various surgical approaches and current available evidence to support this approach in LVAD patients from teens to older adults.*

#### **DEBATE: Too Cachectic for LVAD: Address Cachexia First, VAD Next!**

*Cachexia is common in advanced heart failure patients. There are currently no guidelines regarding the management of this patient population and the outcomes associated with LVAD. The data in regards to BMI cut offs or other variables for the assessment of the degree of cachexia is also limited. There are no guidelines to clarify the best approach for optimization or timing of it.*

**PRO: Emily K. Granger, MBBS, St Vincent's Hospital, Sydney, Australia**

*This speaker will discuss specific recommendations and strategies to SUPPORT the optimization of patients with cachexia pre LVAD and discuss current supporting evidence and outcomes associated with this approach.*

**CON: Rebecca Cogswell, MD, University of Minnesota, Minneapolis, MN, USA**

*This speaker will discuss specific recommendations and strategies that OPPOSE the optimization of patients with cachexia pre LVAD and discuss current supporting evidence and outcomes associated with this approach.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### The Cardiogenic Shock Journey: Shock Therapy

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART, LUNG

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health

**Session Summary:** This symposium will address emerging concepts in the acute management of cardiogenic shock (CS). Through a series of short talks, speakers will highlight various cardiogenic shock phenotypes, device selection/timing, optimizing ICU care, etiological considerations to first pass management principles, and temporary mechanical circulatory support device-tailoring, weaning and explant considerations including rehabilitation and end-of-life considerations.

**Session Chairs:** George Javorsky, MBBS, FRACP, and Edith Boyes, APN

#### ***Etiology Doesn't Matter, It's All In The Phenotype***

**Jaime Hernandez-Montfort, MD, MPH, Baylor Scott & White Health, Austin, TX, USA**

*This talk highlights different cardiogenic shock phenotypes, and how they fit into the Society for Cardiovascular Angiography and Interventions (SCAI) staging algorithm and impact clinical patient outcomes. It also discuss the role of artificial intelligence in phenotyping.*

#### ***Right Support, Right Time***

**Pascal N. Leprince, MD, PhD, La Pitie Salpetriere, Paris, France**

*Discussion on both initiating and escalating of temporary support – picking the right device at the correct time. With many devices available to select, which device is best for the appropriate time.*

#### ***Patient is on Temporary Circulatory Support: ICU Considerations on Optimizing Physiology***

**Hannah Copeland, MD, Lutheran Hospital/Indiana University School of Medicine, Fort Wayne, IN, USA**

*Debate in regards to LV decompression and weaning of inotropes continue balancing the deleterious effects of inotropes with the complications of mechanical support.*

#### ***Temporary MCS Weaning and Explant: Can One Size Fit All?***

**Jerry D. Estep, MD, Cleveland Clinic, Cleveland, OH, USA**

*This talk discusses device-tailoring towards an ambulatory platform and device-specific weaning, explant, transition to durable mechanical circulatory support and transition to heart transplant based on international institutional practices.*

#### ***When "Shockingly Breathless" to Vent and Bundle Care Even in Critically Ill Cardiac Patients?***

**Varinder Kaur Randhawa, MD PhD, Cleveland Clinic, Cleveland, OH, USA**

*This talk discusses the risk-benefit considerations for mechanical ventilation in CS patients with varying degrees of respiratory distress and hypoxia due to valvular heart disease (e.g., aortic stenosis, mitral regurgitation), along with bundling care as the ABCDEs apply to cardiac critical care management. This talk will also include cannulation strategies for ambulating and maintaining muscular strength as well as range of motion with temporary MCS/ECMO.*

#### ***To Somewhere Over the Rainbow: Role of the Post-Shock and Rehab Clinics***

**Jose Gonzalez-Costello, MD, Belvitge Hospital, Barcelona, Spain**

*This talk discusses the longitudinal well-being of the CS recovered patient after hospital discharge, including the emerging role of post-shock clinics, LVAD clinics and cardiac rehab programs to overcome frailty and other critical illness complications with remote monitoring.*

#### ***When All Else Fails: Dignifying End-of-Life Considerations***

**Michael McDonald, MD, Toronto General Hospital, Toronto, ON, Canada**

*This talk discusses how to address advanced care directives, palliative care considerations for in-hospital versus at home hospice care, and turning off device therapy.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Double Trouble: End-Stage Renal Failure in End-Stage Heart Failure

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pharmacy, Research & Immunology

**Session Summary:** This symposium will review kidney disease in the heart failure population, including patient selection for advanced therapies. Evolving management strategies to combat diuretic resistance will be addressed. Renal replacement therapy in heart failure patients and the potential deleterious hemodynamic effect of arteriovenous fistulas as well as optimal renal replacement therapy options for patients on long-term LVAD support will be discussed.

**Session Chairs:** Michael S Kiernan, MD, and Sanem Nalbantgil, MD

#### **Leading With Electrolytes: Urinary Sodium to Empower Nursing Algorithms for Decongestion in the Unresponsive Patient**

Michelle M. Kittleson, MD, PhD, Cedars Sinai Hrt Insti, Los Angeles, CA, USA

*The speaker will discuss the pathophysiology of diuretic resistance and methods for assessing diuretic responsiveness to guide dosing, as well as the role for monitoring urinary sodium and review of diuretic dosing protocols and associated outcomes.*

#### **LVAD Therapy and Kidney Function: Chicken, Egg, or Cystatin C?**

Paolo C. Colombo, MD, Columbia University Medical Center, New York, NY, USA

*Accurate estimation of renal function is key to guiding management before and after LVAD. Serum creatinine (sCr) is routinely used to estimate glomerular filtration rate (GFR). However, reduction in sCr generation due to muscle loss, which is frequent in advanced heart failure, may lead to overestimation of the actual GFR. Following LVAD implant, additional muscle loss during recovery from the surgery may account for the transient increase eGFRsCr observed early post LVAD. This lecture focuses on Cystatin-C, a biomarker less influenced by muscle mass that might be superior in the assessment of renal function of LVAD recipients.*

#### **Assessing Thresholds for MCS and Transplantation: Whose Kidneys Will Improve?**

Finn Gustafsson, MD, PhD, Rigshospitalet, Copenhagen, Denmark

*This lecture will discuss the assessment of renal thresholds in patients with advanced heart failure to determine candidacy for heart transplantation or LVAD therapy. How do we pinpoint the patients whose kidney function will improve (without requiring dual organ transplant)?*

#### **Assessment of Combined Transplants: To Do or Not To Do?**

Satoshi Saito, MD, PhD, Tokyo Women's Med Univ, Tokyo, Japan

*This talk is given from the surgeon's perspective: insights into evaluation, decision making and ethics in the challenging area of renal transplant in the populations of cardiac transplants and durable MCS. For patients with chronic kidney disease (CKD) prior to transplant (heart only versus combined organ transplants), as well as in heart transplant recipients with CKD, when is the timing right? How are the outcomes?*

#### **Pumped and Distended: Assessing Optimal Dialysis Modalities in Patients With Pumps**

Jennifer Cowger, MD, Henry Ford Hospitals, Detroit, MI, USA

*This lecture will provide a short overview of hemodynamics in patients with cf-LVAD and a renal fistula followed by review of optimal dialysis modalities of these heart failure patients. The speaker will discuss challenges of hemodialysis in LVAD patients and data for peritoneal dialysis in this population.*

#### **A Technical View on Immunosuppressive Therapies for Renal Protection After Cardiac Transplantation**

Amanda Ingemi, PharmD, Sentara Norfolk General Hospital, Norfolk, VA, USA

*The speaker will provide a technical view on immunosuppressive strategies to preserve renal function while also preserving the cardiac allograft (CNI versus mTOR inhibitors, when to initiate?). Data will be presented globally and locally using other immunosuppressive agents.*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Optimization of Management of Patients on LVAD Support: 2022 and Beyond

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Nursing and Allied Health, Pharmacy

**Session Summary:** Objectives of this symposium include describing patient-centered definitions of optimal outcomes during LVAD support, strategies and goals for optimization of LVAD speed and medical therapy, and innovations in virtual care including remote patient monitoring and telerehabilitation in the management of patients supported by an LVAD.

**Session Chairs:** Stavros G Drakos, MD, PhD, FACC, and Stephan M. Ensminger, MD, DPhil

#### ***Defining Optimal Outcomes on LVAD Support: Patient Perspective***

**Maria G. Crespo-Leiro, MD, Hospital University A Coruna, La Coruna, Spain**

*Definitions for optimal outcomes on LVAD support, including quality of life, functional status, and days out of the hospital, will be discussed.*

#### ***Avoiding the “Set It and Forget It Mentality”: Reassessing Patients with an LVAD Post Implant***

**Palak Shah, MD, MS, Inova Fairfax Hospital, Falls Church, VA, USA**

*Indications and strategies (including hemodynamic and echocardiographic ramp testing, CardioMEMS) for optimization of LVAD speed will be discussed.*

#### ***Medical Optimization During LVAD Support***

**Christopher S. Hayward, MD, St. Vincent's Hospital, Sydney, Australia**

*Indications and strategies for medical optimization of patients with an LVAD, including recently published data, will be discussed.*

#### ***Remote Optimization of Patients with an LVAD: Blood Pressure, Telerehabilitation, and More!***

**Himabindu Vidula, MD, University of Rochester, Rochester, NY, USA**

*This lecture will discuss strategies to apply virtual visits, telemonitoring, telerehabilitation and remote blood pressure monitoring in patients supported with an LVAD.*

#### ***Machine Learning, Artificial Intelligence, and MCS: Learning From Big Data to Build a Smarter Pump***

**Manreet Kanwar, MD, Allegheny General Hospital, Pittsburgh, PA, USA**

*The use of machine learning to analyze big data from LVAD patients and help create a smarter pump for the future will be discussed.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### Unique Challenges for Women and Children Supported with MCS

Primary Core Therapy: MCS

Primary Audience: Cardiology

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Infectious Diseases, Nursing and Allied Health, Pediatrics

**Session Summary:** The prevalence of heart failure is equal in men and women. However, women admitted for heart failure are younger, sicker and have higher heart failure related mortality. Regardless, only about 20% of LVAD recipients are women, a fraction that has remained unchanged over the last decade even with increasing device use. It is of great importance to raise awareness and better understand sex-specific differences which affect candidacy and outcomes in women on LVAD therapy aiming to increase utilization of this life saving therapy. Specific research priorities addressing sex disparities in MCS will be proposed. Similarly, MCS options, strategies and experience for supporting smaller patients in the pediatric population will be discussed.

**Session Chairs:** Mirnela Byku, M.D., and Rachna Kataria, MD

#### ***The Heart of a Woman***

**Mary Norine Walsh, MD, MACC, St Vincent Heart Center, Indianapolis, IN, USA**

*Review unique anatomical and physiological features of women's cardiovascular system (e.g. heart and vessel size, vascular reactivity, inflammatory milieu, heart failure etiology and comorbidities).*

#### ***Cardiogenic Shock in Pregnancy***

**Anique Ducharme, MD, MSC, Montreal Heart Institute, Montreal, QC, Canada**

*Review acute peri-partum cardiomyopathy management, including the potential use of bromocriptine and considerations around MCS deployment peri-partum. Spontaneous coronary artery dissection as a challenging cause of cardiogenic shock in pregnancy will also be considered.*

#### ***Temporary Circulatory Support (TCS) Options in Women and Children***

**Jamila Kremer, MD, University Hospital Heidelberg, Heidelberg, Germany**

*The current generation temporary axial flow MCS devices and ECMO cannulae are best suited to patients with larger arterial vessel caliber and may not be as easily or safely deployable in women or smaller patients. Review practical considerations and tips for safe acute MCS deployment in these patients.*

#### ***How Low Can You Go: Durable LVAD Considerations for Smaller Patients***

**Ryan Davies, MD, UT Southwestern, Dallas, TX, USA**

*The speaker will present strategies for utilizing durable LVADs in smaller patients including women and children. Determining fit, surgical modifications, driveline tunneling and management, and troubleshooting other complications in smaller patients will be discussed.*

#### ***Hello Estrogen!***

**Juliane Vierecke, MD, University of Cincinnati Health, Cincinnati, OH, USA**

*Review approach to management and considerations on effects of menstruation, contraception, bromocriptine and menopause on LVAD therapy.*

#### ***Equal Opportunity: Why are Women Less Likely To Be Referred for LVAD and How Can We Overcome These Barriers?***

**Heike Spaderna, PhD, University of Trier, Trier, Germany**

*Review current data on gender disparities in LVAD referrals and discuss possible etiologies. Review psychosocial challenges which affect candidacy and outcomes in women: SIPAT scores, motherhood, frailty, caregiver role. Present possible strategies to address the disparities.*

#### ***Panel Discussion***

## SYMPOSIUM SESSION (90 minutes)

### The Risky Arrhythmia: Matching Risks and Benefits of Cardiac Devices in LVAD Patients

Primary Core Therapy: MCS

Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Infectious Diseases, Nursing and Allied Health, Pharmacy

**Session Summary:** Cardiac implantable electric devices (CIED) are a mainstay of current heart failure therapy, mostly before heart transplantation or LVAD implantation are considered. Up to 89% of patients have an implantable cardioverter defibrillator (ICD) at the time of LVAD implantation. However, the role of CIED like ICD, CRT-P and CRT-D in LVAD patients remains a matter of debate. This session will give an overview on the role of arrhythmias and their therapy in LVAD patients while discussing current approaches towards CIEDs in LVAD patients.

**Session Chairs:** Laurens Tops, MD, and Margaret M Hannan, MD

#### **Arrhythmias in LVAD Patients: From the Atrium to the Ventricle**

**Natasha Aleksova, MD, Toronto General Hospital, Toronto, ON, Canada**

*This lecture will provide an overview on the incidence of atrial and ventricular arrhythmias in patients before and after LVAD implantation, including long-term follow-up. The effect of these arrhythmias on hemodynamics and prognosis will be addressed, as well as the various treatment options including ablation and device therapy.*

**Q&A (3 minutes)**

#### **DEBATE: Cardiac Devices in LVAD Patients: the More the Merrier? All LVAD Patients Should Have an ICD**

**PRO: Elena Sandoval, MD FEBCTS, Hospital Clinic, Barcelona, Spain**

*This speaker will give an overview about current data favoring ICD therapy in LVAD patients. It will start with a focus on the benefits of ICD therapy in heart failure patients before LVAD implantation, highlight current guidelines in both non-LVAD and LVAD patients, and address the current available evidence favoring ICD therapy in LVAD patients.*

**CON: Jason N. Katz, MD, MHS, University of North Carolina, Chapel Hill, NC, USA**

*This speaker will give an overview about current data that does not favor ICD therapy in LVAD patients. This talk will discuss the trials in heart failure (non-LVAD) patients, the current guidelines on ICD therapy in LVAD patients and give an overview about long term complications of CIED therapy in general and especially in LVAD patients.*

**Q&A (6 minutes)**

#### **DEBATE: CRT Should Be Turned On in LVAD Patients**

**PRO: Brian Houston, MD, Medical University of South Carolina, Charleston, SC, USA**

*This speaker will give an overview about the current available data supporting Cardiac Resynchronization Therapy (CRT) in LVAD patients. This talk will further focus on acute hemodynamic effects of CRT on the right ventricle in LVAD patients.*

**CON: Evan P. Kransdorf, MD, PhD, Cedars-Sinai Heart Institute, Los Angeles, CA, USA**

*This speaker will give an overview about the current available data that supports turning off Cardiac Resynchronization Therapy (CRT) in LVAD patients. This talk will further discuss the effects of turning off the CRT on battery longevity.*

**Q&A (6 minutes)**

#### **ICD and CRT-D Battery Depletion in an LVAD Patient: Change? Downgrade?**

**Jaime-Juergen Eulert-Grehn, MD, German Heart Institute, Berlin, Germany**

*This lecture will provide data on how to approach an LVAD patient needing battery exchange with a focus on bleeding risk and pocket related complications.*

**Q&A (3 minutes)**

## SYMPOSIUM SESSION (90 minutes)

### Structural Heart, Mitral and Tricuspid Valve Disease in LVAD Patients: Current Insight and Controversies

Primary Core Therapy: MCS

Primary Audience: Cardiothoracic Surgery

Secondary Core Therapies: HEART

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Nursing and Allied Health

**Session Summary:** At the time of VAD implant, structural heart diseases are commonly present. While some of them require prompt correction like aortic regurgitation or atrial/ventricular septal defect, large discussions and different approaches are available for 'forgiving' pathologies which might play a pivotal role in long term outcomes, especially for destination therapy patients. Concomitant mitral valve repair at the time of LVAD implantation continues to be debated and available literature is limited in providing a definitive guidance. Approximately half of LVAD candidates have moderate-to-severe tricuspid regurgitation (TR), associated with RV failure and impaired survival after LVAD surgery. Usual thoughts are that concomitant TR surgery should be considered. However, spontaneous reduction of TR after LVAD implantation is common, making it controversial whether TR should be surgically corrected. Current insights and controversies of mitral and tricuspid valve disease in LVAD patients will be presented as well as coronary pathologies.

**Session Chairs:** Mrudula R Munagala, MD, and Alessandro Barbone, MD, PhD

#### **Pathophysiology and "Natural History" of Tricuspid Regurgitation in LVAD Patients**

**Kadir Caliskan, MD, PhD, Erasmus Medical Center, Rotterdam, Netherlands**

*Tricuspid valve disease is prevalent in patients with end-stage heart failure undergoing LVAD implantation. The pathophysiology of TR in these patients is multifactorial. The natural history of TR is heavily influenced by the underlying etiology and phenotype.*

#### **Concomitant TR Surgery in LVAD Implantation: Yes or No?**

**Ivan Netuka, MD, PhD, Institute for Clinical and Experimental Medicine, Prague, Czech Republic**

*Currently, there is no firm evidence for a concomitant TR surgery in LVAD implantation. Several cohort studies and registry data analysis failed so far to show a clear benefit for TR intervention in these patients. In contrast, concomitant TR surgery could increase the risk of perioperative right heart failure due to need of longer cardiopulmonary bypass time. However, concomitant TR surgery with LVAD implantation is safe and should be considered to prevent perioperative morbidity and mortality.*

#### **Alternate Therapies and Future Perspectives for Tricuspid Valve Pathologies in LVAD Patients**

**Daniel Zimpfer, MD, MBA, Medical University of Vienna, Vienna, Austria**

*In this lecture, minimally invasive surgical and transcatheter-based tricuspid valve therapies will be presented. A patient with residual TR pre- or post-LVAD implantation could be offered a staged or bail-out TR intervention.*

#### **Take It or Leave It: Is There a Benefit of Concomitant Mitral Valve Repair at the Time of LVAD Implantation or Should We Leave the Valve Alone?**

**Jan D. Schmitto, MD, PhD, MBA, FCCP, FRCS, Hannover Medical School, Hannover, Germany**

*This presentation will describe the current cumulative experience of concomitant mitral valve procedures in patients undergoing LVAD implantation and the outcomes. The speaker will also identify the specific patient or clinical characteristics that may be associated with good outcomes, and will highlight reasons for when to leave the MV and MR as they are.*

#### **Mitra Clip Prior to LVAD Implantation: a Viable Option of Mitral Repair?**

**Dina De Bock, MD, Antwerp University Hospital, Edegem, Belgium**

*This lecture will describe if mitra-clip placement prior to LVAD implantation is a meaningful method of mitral intervention to address severe MR in patients with end stage heart failure undergoing LVAD implantation.*

#### **Preexisting Mitra Clip in Patients Undergoing LVAD Implantation: Boon or a Bane**

**Paul C. Tang, MD, PhD, University of Michigan, Ann Arbor, MI, USA**

*The COAPT clinical trial brought mitra-clip as a presentable option for patients with significant MR as a consequence of LV dysfunction. However, there are reported case series that demonstrated continued progression of LV dysfunction leading to subsequent LVAD placement. This talk will delineate patients who would benefit from mitra-clip from those who may need to proceed with advanced heart failure therapies. In addition, the speaker will describe the pros and cons of LVAD implantation in patients with MitraClip.*

#### **Revascularize or Not a Critical Coronary at the Time of LVAD Implant**

**John M. Stulak, MD, Mayo Clinic, Rochester, MN, USA**

*Is it worth proceeding with a coronary artery bypass graft (CABG) at the time of implant, especially on a critical LAD, on a ventricle that is going to be unloaded? Do we need and/or do we require to prove ischemia? Is it the same on the RCA?*

#### **Panel Discussion**

## SYMPOSIUM SESSION (90 minutes)

### Train the Trainer and Trainer Best Practices: What MCS Clinicians Can Learn From Their Patients

Primary Core Therapy: MCS

Primary Audience: Nursing and Allied Health

Secondary Core Therapies: HEART

Secondary Audiences: Cardiology, Cardiothoracic Surgery, Infectious Diseases

**Session Summary:** Providers hear "please tell the next patient this", or are asked "do you know what it's like being me?" As providers we face many challenges in the MCS field: Alarms. Pre-surgery need-to-knows. Lack of social support. Facing death. Nurses and allied health professionals gain insight and empathy from their patients. The focus of this session is to provide education through case scenarios, incorporating lessons taught, and what we learn from the ones we care for every day.

**Session Chairs:** Thomas Schlöglhofer, MSc, and Jennifer Hajj, MHDS, BSN, RN, CCRN-K

#### ***My LVAD is Alarming, Now What?***

**Sarah Schettler, PA-C, Mayo Clinic, Rochester, MN, USA**

*The focus of this presentation is to discuss not only those tricky scenarios of VAD alarms, but how to help our patients deal with them, and the lessons we learn from what our patients experience and endure.*

#### ***Patient-Centered Approaches to Infection Prevention and Management***

**Desiree Robson, RN BSc (Hons), St Vincent 's Hospital, Sydney, Australia**

*This presentation will focus on concerns patients have about VAD infections. The speaker will address lessons learned from our patients and provide tips for a patient-centered approach to infection prevention and management. Questions could include: How do I personalize my dressing change technique if I can't use the standard prep due to skin irritation? How do I reduce the risk of infection with daily activities such as showering? What should I do after driveline trauma? I have an infection requiring IV antibiotics – how do I manage multiple devices (LVAD and PICC line) at once?*

#### ***Tough Discussions Aren't For the Faint Hearted: What Patients Want to Know But Are Afraid to Ask***

**Michael Scala, MSN, AGACNP-BC, Ascension Saint Thomas, Nashville, TN, USA**

*This presentation addresses possible fears and resulting questions that patients may not have asked before and during their MCS therapy. Some examples might be: What did they want to know before surgery but were too afraid to ask? What do they want to know when going home to ease their transition? What do their providers need to know about what it's really like to have a VAD? This presenter will be challenged to keep the patient first through this all and add in pearls of what we learn from our patients every day about what they are afraid to ask so we can help our future patients.*

#### ***Game Changer or Status Quo: The Real Life Effects of Social Support in MCS***

**Andrew Woods, BSc, Newcastle upon Tyne NHS Foundations Trust, Newcastle upon Tyne, United Kingdom**

*We fail to talk about the patient perspective of what social support means to them, which is different for each patient. Many times the medical teams get so caught up in whether or not there is support, that we forget to sit down and truly talk to the patient. This presentation will take a different spin on things for social support, and instead talk about what really matters in the success of the individual patients when it comes to social support. We need to talk about how we get there, how we individualize patient care, and ultimately involve the patient in these very hard discussions.*

#### ***Walking that Walk Alone: Helping the Dying MCS Patient***

**Sarah E. Schroeder, ACNP-BC, MSN RN, Bryan Heart, Lincoln, NE, USA**

*Our job is to keep patients alive; to improve quality of life. Yet, all good things come to an end. This presentation will discuss end of life in MCS patients, and trials and tribulations in the medical teams when end of life decisions are difficult. The presentation will talk about end of life in an MCS patient, hospice collaboration, and how to allow for a dignified death every time. There will be a short segment on post-mortem explanation as many individuals are responsible for completing this task but do not know what to do.*

#### ***Panel Discussion***



## SYMPOSIUM SESSION (90 minutes)

### Between a Rock and a Hard Place: Pulmonary Vascular Disease and Solid Organ Transplantation

Primary Core Therapy: PVD

Primary Audience: Pulmonology

Secondary Core Therapies: LUNG

Secondary Audiences: Anesthesiology & Critical Care, Cardiology, Cardiothoracic Surgery, Pediatrics

**Session Summary:** This session will focus on the impact of pulmonary vascular disease on solid organ transplantation (heart, lung, and liver) outcomes including mortality and graft failure, prognostic tools to identify adult and pediatric patients with pulmonary hypertension (PH) at high risk of adverse outcomes, and potential strategies (mechanical circulatory support, targeted pulmonary vasodilator therapy) to mitigate those risks.

**Session Chairs:** Arun Jose, MD, and Elie Fadel, MD

#### **Take a Deep Breath: Pulmonary Hypertension and Lung Transplantation**

**Nicholas A. Kolaitis, MD, UCSF, San Francisco, CA, USA**

*This talk will discuss the impact of pulmonary hypertension on lung transplantation considerations, including optimal hemodynamics prior to lung transplant, single versus double lung versus heart/lung transplant, impact of bridge to transplant strategies (ECMO/MCS) on post-transplant outcomes, and considerations for patient selection (targeted therapy regimens to optimize transplantation outcomes, timing of listing for transplant, etc.).*

#### **Brief Q&A**

#### **Getting to the "Heart" of the Matter: PH and Heart Transplantation**

**Peter J. Bergin, MBBS, FRACP, Alfred Hospital, Melbourne, Australia**

*This talk will investigate the impact of pulmonary vascular disease on heart transplantation, in particular consideration of bridging strategies (LVAD, RVAD, ECMO) on both perioperative and post-transplant outcomes, role of targeted therapy in patients awaiting heart transplant (both those with PAH and those with secondary PH with elevated PVR and evidence of vascular remodeling), and predictors of post-transplant outcomes in this patient population.*

#### **Brief Q&A**

#### **Gut Feeling: Pulmonary Hypertension and Liver Transplantation**

**Sonja Bartolome, MD, UT Southwestern Medical Center, Dallas, TX, USA**

*This talk will cover the role of pulmonary vascular disease in liver transplantation, in particular the role of targeted therapy in optimizing patients with Portopulmonary Hypertension for liver transplantation, the most recent updates to MELD exception point criteria for Portopulmonary Hypertension, and highlight areas where further study is needed (combined solid organ transplant such as liver/kidney, transplant considerations for combined Portopulmonary Hypertension and Hepatopulmonary Syndrome, etc.).*

#### **Brief Q&A**

#### **More is Better: Pulmonary Hypertension and Multi-Organ Transplantation**

**Thirugnanasambandan Sunder, MD, Apollo Hospitals, Chennai, Chennai, India**

*This talk will cover the role of pulmonary vascular disease resulting in the need for multi-organ transplantation. What congenital heart defects can be repaired and which necessitate heart-lung transplant? Is there a point at which the RV will not recover post isolated lung transplantation for PAH? When is PH too severe to consider isolated heart transplantation? The role of LVAD could be discussed also. Will the PH improve or resolve post isolated liver transplant in the setting of portopulmonary hypertension? When is lung transplantation also required?*

#### **Brief Q&A**

## SYMPOSIUM SESSION (90 minutes)

### Controversial Debates in Pulmonary Hypertension

Primary Core Therapy: PVD

Primary Audience: Pulmonology

Secondary Core Therapies: HEART, LUNG, MCS

Secondary Audiences: Anesthesiology & Critical Care, Cardiothoracic Surgery, Pharmacy

**Session Summary:** This session will address issues on the diagnosis and management of pulmonary hypertension. Risk stratification is critical in management decision-making and the role of invasive hemodynamics has been challenged by the increased use of imaging techniques. Should we avoid right heart catheterization (RHC)? Heart failure is the most common cause of PH. Some pulmonary arterial hypertension (PAH) approved drugs are often used off-label without strong evidence. Is it really indicated? Are patients really improved?

**Session Chairs:** Erika B Rosenzweig, MD, and Jean-Luc Vachiery, MD

**DEBATE: Invasive Hemodynamics are Essential for Risk Stratification in PAH**

RHC is the gold standard for the assessment of disease severity in patients with PAH. Important variables (such as cardiac index, stroke volume and right atrial pressure) cannot be reliably derived from non-invasive tools. In addition, RHC is recommended to establish baseline and follow up risk stratification.

**PRO:** Sophia Airhart, MD, Providence Heart and Vascular Institute, Providence, RI, USA

The speaker will defend the position that RHC and invasive hemodynamics are essential for the management of patients with severe precapillary PH.

**CON:** Marc A. Simon, MD, UCSF Medical Center, San Francisco, CA, USA

The speaker will defend the opposite motion and discuss the role of imaging techniques in the setting of risk stratification.

**Pro/Con Discussion (10 minutes)**

**DEBATE: PH Due to Interstitial Lung Disease (ILD) Should Be Treated with PAH Approved Therapies**

When present in interstitial lung disease, PH is associated with a worse outcome. In addition, Group 3 PH and PAH share similar pathobiological and clinical features. There is an increased off-label use of PAH-approved therapies, especially in patients with IPF.

**PRO:** Colin Church, PhD, Golden Jubilee Hospital, Glasgow, United Kingdom

The speaker will review the sum of evidence in favor of the motion and defend the idea that patients with PH due to ILD may be harmed by this intervention.

**CON:** Helen M. Whitford, MBBS, FRACP, Alfred Hospital, Melbourne, Australia

The speaker will review the sum of evidence against the motion and defend the idea that patients with PH due to ILD may be harmed by this intervention.

**Pro/Con Discussion (10 minutes)**

**DEBATE: Symptomatic Chronic Thromboembolic Disease (CTED) Should Be Treated with PEA or BPA**

Persistent symptoms of breathlessness in the presence of persistent perfusion defects on imaging in the absence of pulmonary hypertension is seen quite frequently. Pulmonary Endarterectomy (PEA) and Balloon Pulmonary Angioplasty (BPA) have associated risks but overall offer an excellent treatment response.

**PRO:** David P. Jenkins, FRCS, Papworth Hospital, Cambridge, United Kingdom

The speaker will review the evidence in support of using these therapies in patients with CTED.

**CON:** Isabelle Opitz, MD, University Hospital Zurich, Zurich, Switzerland

The speaker will review the evidence against the use of these therapies in patients with CTED.

**Pro/Con Discussion (10 minutes)**

## SYMPOSIUM SESSION (90 minutes)

### Updates in Pulmonary Arterial Hypertension (PAH) Research: What is On the Horizon?

Primary Core Therapy: PVD

Primary Audience: Pulmonology

Secondary Core Therapies: HEART, LUNG

Secondary Audiences: Cardiology, Cardiothoracic Surgery, Pediatrics, Pharmacy

**Session Summary:** PAH is a complex disease with even more complex management. Despite advances in the understanding and treatment of PAH, survival has remained poor. This has encouraged an active area of research in this particular disease with the goal of finding cure. This symposium will discuss some of the recent advances in the diagnosis and management of the disease, covering important changes including the impact of the new hemodynamic definition, clinical trial design and newer treatment pathways.

**Session Chairs:** Amy Kiskaddon, and John Granton, MD

#### ***Pulmonary Hypertension at the Extremes of Life (Pediatric)***

**Rolf Berger, MD, PhD, University Medical Center, Groningen, Netherlands**

*This presentation will cover the differences in the diagnosis and management of PAH in a pediatric population compared to the adult population included in the majority of clinical trials.*

#### ***Pulmonary Hypertension at the Extremes of Life (Geriatric)***

**Hassan Alnuaimat, MD, University of Florida, Gainesville, FL, USA**

*This presentation will cover the differences in the diagnosis and management of PAH in a geriatric population compared to the adult population included in the majority of clinical trials.*

#### ***Novel Imaging Approaches in PAH and CTEPH***

**Micheal McInnis, MD, Toronto General Hospital, Toronto, ON, Canada**

*This presentation will cover the evolving imaging approaches in PAH and CTEPH with particular focus on dual energy computed tomography pulmonary angiography (CTPA).*

#### ***Pulmonary to Systemic Shunts in PAH: Who, When, and How***

**Maurice Beghetti, HUG, Children's University Hospital, Geneva, Switzerland**

*This presentation will define the appropriate patient population and the indications for creation of pulmonary to systemic shunts. It will also focus on the timing of the procedure and how it should be performed.*

#### ***What the Future of Clinical Trials in PAH Should Be: Trial End Points, Design, and Treatment Strategies***

**Jean-Luc Vachiery, MD, Erasme University Hospital, Brussels, Belgium**

*This presentation will focus on the future of PAH clinical trial design, highlighting the current end points for clinical trials, including what the enrichment strategies for trial designs should be and how to incorporate risk stratification tools in the trial designs.*

#### ***Novel Treatment Pathways in PAH: What's in the Pipeline?***

**Bradley Maron, MD, Brigham and Women's Hospital, Boston, MA, USA**

*This presentation will focus on the newer treatment pathways. Recently a phase 2 trial of a disease modifying agent met the end point. Many more disease modifying agents targeting newer molecular pathways are on horizon. This presentation will focus on such potential treatment targets.*

#### ***Panel Discussion***