

**ISHLT Academy: Masters Course in Mechanical Circulatory Support  
Tuesday, April 14, 2015**

**CHAIR:** Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA

**SCIENTIFIC PROGRAM COMMITTEE**

Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, New York, USA  
James K. Kirklin, MD, University of Alabama at Birmingham, Birmingham, AL, USA  
Robert L. Kormos, MD, University of Pittsburgh Medical Center, Pittsburgh, PA, USA  
Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne, United Kingdom  
Jeffrey J. Teuteberg, MD, University of Pittsburgh, PA, USA  
Christopher Wigfield, MD, FRCS, University of Chicago, Chicago, IL, USA

**FACULTY**

Holger W. Buchholz, MD, University of Alberta Hospital, Edmonton, AB, Canada  
Charles E. Canter, MD, St. Louis Children's Hospital, St. Louis, MO, USA  
Arnt E. Fiene, MD, Rikshospitalet, Oslo, Norway  
Aly El-Banayosy, MD, Pennsylvania State Hershey Medical Center, Hershey, PA, USA  
Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, New York, USA  
James K. Kirklin, MD, University of Alabama at Birmingham, Birmingham, AL, USA  
Robert L. Kormos, MD, University of Pittsburgh Medical Center, Pittsburgh, PA, USA  
Pascal Leprince, MD, PhD, Groupe Hospitalier Pitie Salpetriere Paris, France  
Simon Maltais, MD PhD, Vanderbilt Heart & Vascular Institute, Nashville, TN, USA  
Evgenij V. Potapov, MD, PhD, Berlin Heart Center, Berlin, Germany  
J. Eduardo Rame, MD, Pennsylvania Heart and Vascular Center, Philadelphia, PA, USA  
Jan D. Schmitto, MD, PhD, MBA, Hannover Medical School, Hannover, Germany  
Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne, United Kingdom  
Mark S. Slaughter, MD, University Cardiothoracic Surgical Associates, Louisville, KY, USA  
Jeffrey J. Teuteberg, MD, University of Pittsburgh, PA, USA  
Nir Uriel, MD, University of Chicago, Chicago, IL, USA  
Daniel Zimpfer, MD, Medical University Vienna, Vienna, Austria

**SPECIAL INSTRUCTIONS**

**All Academy registrants will be organized into three groups (green, yellow, orange) for purposes of rotating through the small group interactive sessions. All groups will rotate through all sessions throughout the day.**

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**CONTINUING MEDICAL EDUCATION INFORMATION**

**Accreditation Statement**

The International Society for Heart and Lung Transplantation (ISHLT) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

**Credit Designation Statement**

ISHLT designates this live activity for a maximum of 7.5 *AMA PRA Category 1 Credits*.™ Physicians should claim only the credit commensurate with the extent of their participation in the activity.

**Disclosure**

Current guidelines state that participants in CME activities must be made aware of any affiliation or financial interest that may affect the program content or a speaker's presentation. Planners, Faculty and Chairs participating in this meeting are required to disclose to the program audience any real or apparent conflict(s) of interest related to the content of their presentations or service as Chair/Planner. These disclosures will be distributed at the meeting. Additionally, all speakers have been asked to verbally disclose at the start of their presentation if a product they are discussing is not labeled for the use under discussion or is still investigational.

**Course Summary:** The MCS ISHLT Master Class presents a unique international educational opportunity for specialists and developing experts in the field of Mechanical Circulatory Support. A concerted effort brings together faculty and experts to provide an interactive environment well beyond core competency training. The Master Class Modules (MCM) are arranged in advanced breakout sessions for every participant to take full advantage of an integrated curriculum and the exceptional networking opportunity. The specific topics are devised according to defined clinical practice gaps in this fast developing specialty.

**Educational Goals:** The overarching goal is to provide an advanced learning opportunity for specialists and developing experts in the field of MCS and devices for treatment of heart failure patients.

**Target Audience:** Specialists in Heart Failure Care, Cardiothoracic Surgeons with MCS experience, allied health professionals with involvement in MCS patients, VAD Coordinators and critical care specialists, heart transplant professionals.

**Practice gap 1:** The treatment of acute cardiogenic shock has recently been revolutionized with the introduction of mechanical circulatory support (MCS) options. Comprehensive clinical expertise of advanced usage of these therapies including patient and device selection, management of device associated complications, and transition to next step therapies is currently limited to few select centers. Such practice gaps in specialist knowledge and clinical skills constitutes major limitations in patient care.

**Practice gap 2:** With the duration of long term MCS averaging 2 years, the diagnosis and treatment of serious adverse events is increasingly important. Individual practitioners often lack the depth of experience to develop effective strategies to appropriately identify and treat these serious adverse events.

**Practice gap 3:** With the rapid evolution of surgical strategies and long term management algorithms, individual practitioners may lack the extensive expertise required to develop new or alternate surgical approaches and chronic management strategies for specific durable devices.

**Learning Objectives**

Upon completion of the master academy, participants will be able to:

- Differentiate the therapeutic device options for refractory shock in the setting of MCS and understand the associated specific complications.
- Provide patient and device specific weaning protocols in shock patients supported by acute MCS.
- Diagnose serious adverse events including device thrombosis, valvular insufficiency, bleeding, arrhythmia, and right heart failure.
- Provide best practice based-based management plans for the major adverse events after MCS implantation
- Recognize the evolving surgical indications and device related limitations for mechanical support therapy in subgroups of advanced cardiac failure
- Select long-term MCS options with particular consideration of anticipated surgical management aspects.

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SCIENTIFIC PROGRAM SCHEDULE

- 7:30 AM – 8:15 AM**      **REGISTRATION (Hermes Foyer, 2<sup>nd</sup> Floor)**
- 7:45 AM – 8:25 AM**      **MORNING COFFEE (Muses Foyer, 3<sup>rd</sup> Floor)**
- 8:30 AM - 8:50 AM**      **PLENARY SESSION (Thalie/Erato/Uranie)**
- All Delegates:**            *Introduction*, Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY
- 9:00 AM – 10:15 AM**      **SMALL GROUP INTERACTIVE DISCUSSION ROTATIONS**
- Orange Group:**            *Acute Mechanical Support for INTERMACS Profiles 0-1 (Clio)*  
Moderator: Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, NY, USA
- Green Group:**            *Special Challenges of Mechanical Circulatory Support in the Patient with Congenital Heart Disease (Euterpe)*  
Moderator: James K. Kirklin, MD, University of Alabama, Birmingham, AL, USA
- Yellow Group:**            *Bleeding and Thrombosis in Mechanically Supported Patients – A Catch 22? (Thalie/Erato/Uranie)*  
Moderator: Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA
- 10:15 AM**                      **COFFEE BREAK (Muses Foyer)**
- 10:45 AM – NOON**        **SMALL GROUP INTERACTIVE DISCUSSION ROTATIONS**
- Green Group:**            *Acute Mechanical Support for INTERMACS Profiles 0-1 (Clio)*  
Moderator: Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, NY, USA
- Yellow Group:**            *Special Challenges of Mechanical Circulatory Support in the Patient with Congenital Heart Disease (Euterpe)*  
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- Orange Group:**            *Bleeding and Thrombosis in Mechanically Supported Patients – A Catch 22? (Thalie/Erato/Uranie)*  
Moderator: Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA
- 12:10 PM – 1:25 PM**      **SMALL GROUP INTERACTIVE DISCUSSION ROTATIONS**
- Yellow Group:**            *Acute Mechanical Support for INTERMACS Profiles 0-1 (Clio)*  
Moderator: Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, NY, USA
- Orange Group:**            *Special Challenges of Mechanical Circulatory Support in the Patient with Congenital Heart Disease (Euterpe)*  
Moderator: James K. Kirklin, MD, University of Alabama, Birmingham, AL, USA
- Green Group:**            *Bleeding and Thrombosis in Mechanically Supported Patients – A Catch 22? (Thalie/Erato/Uranie)*  
Moderator: Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA
- 1:25 PM – 2:45 PM**      **LUNCH BREAK (box lunches are provided for all Academy registrants)**

**2:45 PM – 3:45 PM      SMALL GROUP INTERACTIVE DISCUSSION ROTATIONS**

**Orange Group:**      *Decision Making in the Transition from Acute Temporary Support to Durable LVAD*  
**(Clio)**

Moderator: Robert L. Kormos, MD, University of Pittsburgh Medical Center,  
Pittsburgh, PA, USA

**Green Group:**      *Post-VAD Complications: Right Ventricular Failure, Ventricular Tachycardia, and*  
*Aortic Insufficiency (Euterpe)*

Moderator: Jeffrey J. Teuteberg, MD, University of Pittsburgh, Pittsburgh, PA, USA

**Yellow Group:**      *Alternative Surgical Techniques for Implantation, Exchange and Explantation in Long*  
*Term LVADS (Thalie/Erato/Uranie)*

Moderator: Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne Hospital,  
Newcastle Upon Tyne, UK

**3:55 PM – 4:55 PM      SMALL GROUP INTERACTIVE DISCUSSION ROTATIONS**

**Green Group:**      *Decision Making in the Transition from Acute Temporary Support to Durable LVAD*  
**(Clio)**

Moderator: Robert L. Kormos, MD, University of Pittsburgh Medical Center,  
Pittsburgh, PA, USA

**Yellow Group:**      *Post-VAD Complications: Right Ventricular Failure, Ventricular Tachycardia, and*  
*Aortic*

*Insufficiency (Euterpe)*

Moderator: Jeffrey J. Teuteberg, MD, University of Pittsburgh, Pittsburgh, PA, USA

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*Term LVADS (Thalie/Erato/Uranie)*

Moderator: Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne Hospital,  
Newcastle Upon Tyne, UK

**4:55 PM – 5:15 PM      COFFEE BREAK**

**5:15 PM – 6:15 PM      SMALL GROUP INTERACTIVE DISCUSSION ROTATIONS**

**Yellow Group:**      *Decision Making in the Transition from Acute Temporary Support to Durable LVAD*  
**(Clio)**

Moderator: Robert L. Kormos, MD, University of Pittsburgh Medical Center,  
Pittsburgh, PA, USA

**Orange Group:**      *Post-VAD Complications: Right Ventricular Failure, Ventricular Tachycardia, and*  
*Aortic Insufficiency (Euterpe)*

Moderator: Jeffrey J. Teuteberg, MD, University of Pittsburgh, Pittsburgh, PA, USA

**Green Group:**      *Alternative Surgical Techniques for Implantation, Exchange and Explantation in Long*  
*Term LVADS (Thalie/Erato/Uranie)*

Moderator: Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne Hospital,  
Newcastle Upon Tyne, UK

**6:20 PM – 6:45 PM      PLENARY SESSION (Thalie/Erato/Uranie)**

*Wrap-up; The Future of MCS*, Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx,  
NY, USA

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**SMALL GROUP INTERACTIVE DISCUSSION GROUP**

**ACUTE MECHANICAL SUPPORT FOR INTERMACS PROFILES 0-1**

Moderator: Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, NY, USA

**Options for MCS in Dying and Nearly Dying Patients**

Daniel J. Goldstein, MD, Montefiore Medical Center, Bronx, NY, USA

**Case Scenario: Acute MI cardiogenic shock. Patient on iabp and dopamine failing**

Simon Maltais, MD PhD, Vanderbilt Heart & Vascular Institute, Nashville, TN, USA

**Teaching/Discussion Points**

- a. Revascularization issues
- b. Assess potential for LV recovery
- c. Options for support
- d. Go to OR or stay in cath lab?
- e. Univentricular vs biventricular support
- f. ECMO decision - cannulation, distal perfusion
- g. Assess LV recovery while on ECMO

**Case Scenario: Young patient arrives in ER with ongoing CPR with intermittent vitals**

Pascal Leprince, MD, PhD, Groupe Hospitalier Pitie Salpetriere Paris, France

**Teaching/Discussion Points**

- a. When to say no: Utility vs futility
- b. Cooling
- c. Peripheral ECMO in ER
- d. Hypoxia switch to subclavian
- e. Akinetic left ventricle on ECMO - options for drainage
- f. Evaluation of etiology of decompensation while on ECMO - EMB, LHC

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**SMALL GROUP INTERACTIVE DISCUSSION GROUP**

**SPECIAL CHALLENGES OF MECHANICAL CIRCULATORY SUPPORT IN THE PATIENT WITH  
CONGENITAL HEART DISEASE**

Moderator: James K. Kirklin, MD, University of Alabama, Birmingham, AL, USA

**Framing the History of Mechanical Circulatory Support in the Univentricular Heart**

James K. Kirklin, MD, University of Alabama, Birmingham, AL, USA

**Brief Review of Published Experience with MCS Support of the Systemic Right Ventricle**

James K. Kirklin, MD, University of Alabama, Birmingham, AL, USA

**Case Scenario: Challenges of MCS in the Univentricular Heart**

Charles E. Canter, MD, St. Louis Children's Hospital, St. Louis, MO, USA

**Teaching/Discussion Points**

- a. Decision-making for various stages of single ventricle palliation
- b. When is the MCS option hopeless?
- c. Adjustment of pulmonary blood flow in the pre-Fontan setting
- d. Decisions and devices in the failing Fontan

**Case Scenario: Challenges of MCS in Adults with a Failing Systemic Right Ventricle**

Holger W. Buchholz, MD, University of Alberta Hospital, Edmonton, AB, Canada

**Teaching/Discussion Points**

- a. Diagnostic evaluation in corrected transposition with heart failure or transposition with prior atrial switch
- b. Timing of MCS intervention
- c. Device choice and surgical decisions
- d. Perioperative management dilemmas

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**SMALL GROUP INTERACTIVE DISCUSSION GROUP**

**BLEEDING AND THROMBOSIS IN MCS SUPPORTED PATIENTS – A CATCH 22?**

Moderator: Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA

**Prevalence, Diagnosis, and Management of Bleeding and Thrombotic Events**

Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA

**Case Scenario: Refractory GI bleeding in HM II patient**

Nir Uriel, MD, University of Chicago, Chicago, IL, USA

**Teaching/Discussion Points**

- a. Medical therapy: Octreotide, thalidomide, estrogen, Humate P
- b. Withholding all anticoagulation / antiplatelets
- c. Embolization, nasal artery embolization, small bowel embolization
- d. Resection

**Case Scenario: Device Thrombosis HVAD**

Ulrich P. Jorde, MD, Montefiore Medical Center, Bronx, NY, USA

**Teaching/Discussion Points**

- a. Log file analysis – how to time / diagnose / decide on Rx for thrombosis
- b. Watchful waiting pro/con
- c. TPA, integrilin (difference in approach with HM II)
- d. Timing of exchange (difference in approach if HM II)

**Case Scenario: Acute Stroke in LVAD Patient**

Jan D. Schmitto, MD, PhD, MBA, Hannover Medical School, Hannover, Germany

**Teaching/Discussion Points**

- a. Risk factors for stroke, typical location of cardioembolic stroke
- b. Reversal of anticoagulation (treat brain / not pump),
- c. Aortic root clot – pump speed management
- d. Catheter based intervention – clot extraction
- e. When can patient go on bypass for HTX again?

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**SMALL GROUP INTERACTIVE DISCUSSION GROUP**

**DECISION MAKING IN THE TRANSITION FROM ACUTE TEMPORARY SUPPORT TO DURABLE LVAD**

Moderator: Robert L. Kormos, MD, University of Pittsburgh Medical Center, Pittsburgh, PA, USA

**Conversion from Temporary to Durable MCS: the Challenges to Success**

Robert L. Kormos, MD, University of Pittsburgh Medical Center, Pittsburgh, PA, USA

**Case Scenario: Failure to wean from cardiopulmonary bypass after CABG in patient with poor EF vs previously normal EF. Support is provided by unilateral right, left or bivad Centrimag**

Aly El-Banayosy, MD, Pennsylvania State Hershey Medical Center, Hershey, PA, USA

**Teaching/Discussion Points**

- a. How long to support to attempt recovery of Right or Left ventricular failure
- b. Managing the patient on dialysis
- c. Assessing the native ventricles to determine need for bivad or TAH vs LVAD
- d. Pulmonary recovery
- e. When is the liver recovered enough to tolerate another surgery?
- f. Gathering appropriate information for transplant candidacy determination
- g. Is Destination Therapy an option?

**Case Scenario: Known transplant candidate has an arrest or sudden deterioration while waiting for transplant. Supported on ECMO**

Daniel Zimpfer, MD, Medical University Vienna, Vienna, Austria

**Teaching/Discussion Points**

- a. Stabilization of perfusion and RV function prior to conversion
- b. How much resolution of multi-organ failure is enough to proceed with durable support?
- c. How soon after a CVA can you proceed with conversion?
- d. Palliative care: role in the bridge to bridge condition.
- e. When recurrent ventricular arrhythmia is a cause of arrest and if it recurs while on ECMO, is a BiVAD or TAH required?



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**SMALL GROUP INTERACTIVE DISCUSSION GROUP**

**POST-VAD COMPLICATIONS: RV FAILURE, VENTRICULAR TACHYCARDIA AND AORTIC INSUFFICIENCY**

Moderator: Jeffrey J. Teuteberg, MD, University of Pittsburgh, Pittsburgh, PA, USA

**Prevalence, Risk Factors and Impact on Outcomes of Right Ventricular Failure**

Jeffrey J. Teuteberg, MD, University of Pittsburgh, Pittsburgh, PA, USA

**Case Scenario: Pre-operative and Post-operative Right Ventricle Dysfunction and VT**

J. Eduardo Rame, MD, Pennsylvania Heart and Vascular Center, Philadelphia, PA, USA

**Teaching/Discussion Points**

- a. Assessing RV function – role of echo with strain, tissue Doppler in addition to hemodynamics
- b. Utility of “tuning up” Right ventricle
- c. Timing of temporary RVAD
- d. Weaning of RVAD
- d. Treating Pulmonary hypertension – inhaled, IV, po therapy
- e. Etiology, impact, and initial therapy of VT
- f. Beyond pharmacologic therapy – role of ablation
- g. Role of ICD in those implanted with MCS without prior ICD

**Case Scenario: Patient with LVAD and Moderate Aortic Insufficiency Which Progresses Over Time**

Evgenij V. Potapov, MD, PhD, Berlin Heart Center, Berlin, Germany

**Teaching/Discussion Points**

- a. Risk reduction – blood pressure management, pump management
- b. Assessing impact on pump function – power, flow, log files, echocardiography, hemodynamics
- c. Management – pump settings, percutaneous and surgical approaches, and timing.

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**SMALL GROUP INTERACTIVE DISCUSSION GROUP**

**ALTERNATIVE SURGICAL TECHNIQUES FOR IMPLANTATION, EXCHANGE AND EXPLANTATION IN  
LONG TERM LVADS**

Moderator: Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne Hospital, Newcastle Upon Tyne, UK

**Sternum Sparing Surgical Techniques for Placement and Removal of LVAD's and Driveline  
Troubleshooting**

Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne Hospital, Newcastle Upon Tyne, UK

**Case Scenario: Patient with previous sternotomy and CABG, treated by LVAD via small thoracotomy,  
with outflow graft connected to subclavian artery without CPB**

Arnt E. Fiane, MD, Rikshospitalet, Oslo, Norway

**Teaching/Discussion Points**

- a. previous CABG, patent LIMA/ Grafts issues
- b. risk of cannulation for CPB
- c. plan for surgical incision
- d. imaging technology prior surgery
- e. connecting out flow graft within left chest vs. right chest vs. extra thoracic sites
- f. TOE assessment of off pump implantation
- g. Easier and safer on pump?

**Case Scenario: Myocardial recovery after long term LVAD support – Pump Removal vs.  
“Decommissioning”**

Mark S. Slaughter, MD, University Cardiothoracic Surgical Associates, Louisville, KY, USA

**Teaching/Discussion Points**

- a. Redo Sternotomy vs. left Thoracotomy
- b. Anticoagulation prior the operation
- c. Is CPB necessary for safe removal?
- d. Risk of clots
- e. Leave the Pump
- f. What to do with outflow graft?
- g. Long term anticoagulation?
- h. Surgical similarities for pump exchange

**Case Scenario: A troubled Driveline – Chronic Infection and life threatening Damage**

Stephan Schueler, MD, PhD, FRCS, Newcastle Upon Tyne Hospital, Newcastle Upon Tyne, UK

**Teaching/Discussion Points**

- a. “Best” driveline placement
- b. Surgical options for treatment of local infections
- c. “Best” long term drive line care at home
- d. Serious driveline damage - matter of life or death?