

INTERNATIONAL SOCIETY FOR HEART AND LUNG  
TRANSPLANTATION  
(ISHLT)

**HEART & LUNG TRANSPLANT AND MCS  
CORE COMPETENCY CURRICULUM  
DOCUMENT**

Nursing, Health Sciences and Allied Health (NNSAH)  
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**NURSING, HEALTH SCIENCES AND ALLIED HEALTH  
HEART & LUNG  
TRANSPLANT AND MCS CORE CURRICULUM**

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**NURSING, HEALTH SCIENCES AND ALLIED HEALTH  
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**INTRODUCTION**

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1. The field of heart and lung transplantation and mechanical circulatory support is a dynamic field that continues to advance and evolve to meet the needs of this complex patient population. To that end, we seek to update providers in the nursing, health sciences, and allied health fields that care for this patient population with the most up-to-date information available after a thorough literature review. It is critically important to remain abreast of best practices internationally to ensure that the needs of these patients are met and that providers feel comfortable and competent in offering the necessary care.
2. Many advances and changes in patient management and best practices have occurred since the 2014 version of the core curriculum for heart and lung transplant and mechanical circulatory support. There is a current need for a core curriculum document update in this subject area for ISHLT to remain the leader in dissemination of knowledge in the field of heart and lung transplantation and mechanical circulatory support to the nursing, health sciences, and allied health providers that provide care for this challenging patient population.
3. The authors of this core curriculum estimate that another update will be necessary in 4 years to the nursing, health sciences, and allied health heart and lung transplant and mechanical circulatory support core curriculum. However, should significant advances or changes that should be disseminated to providers occur in the interim, an update could be required sooner than this estimation.

***Section 1: Role of the Transplant and MCS Coordinator: Evolution and Current Practice***

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Learning Objectives for Section 1:

- 1) To establish context and historical background of the Coordinator role.
- 2) To appreciate role differences and variations pending educational backgrounds and training of the provider
- 3) To understand how different roles are integrated in the multidisciplinary team
- 4) To learn international role variations
- 5) To understand opportunities and challenges the role poses

**1. Evolution of the Heart & Lung Transplant and MCS Coordinator role**

- a. RNs and NP/PA/CNS providers
- b. Combined transplant/MCS role and separate roles
- c. Integration and role within the transplant and MCS team
- d. Opportunities, challenges, and limitations of the role

**2. Global role variations**

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*Section 2: Evaluation and Management of the Advanced Thoracic Organ Failure Patient*

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Learning Objectives for Section 2:

- 1) To understand when a provider should consider referring patients for advanced therapy
- 2) To establish elements for evaluation for heart and lung transplant candidates and mechanical circulatory support device candidates
- 3) To understand the various tests and imaging required as a part of the evaluation process
- 4) To learn the role of the coordinator throughout the evaluation of the patient
- 5) To understand components of a psychosocial evaluation prior to consideration for advanced therapy
- 6) To describe new metrics in the evaluation process and to appreciate recent changes in evaluation and management

1. **When to refer...and do they meet criteria?:**  
**Referral and indications/contraindications for heart and lung transplantation and MCS placement**
  - a. Referral methods, timing, evaluation, and evaluation efficiencies
  - b. Contraindications for MCS and differences with VAD and TAH
  - c. Shared Care
2. **Evaluation and management**
  - a. Heart transplant candidacy
    - i. Elements of evaluation
      1. Tests
      2. Imaging
      3. Transplant coordinator role
    - ii. Decision-making
  - b. Lung transplant candidacy
    - i. Elements of evaluation
      1. Tests
      2. Imaging
      3. Transplant coordinator role
    - ii. Decision-making
  - c. MCS (LVAD and/or TAH) candidacy
    - i. Elements of evaluation
      1. Tests
      2. Imaging
      3. Transplant coordinator role
    - ii. Decision-making for BTT vs DT
3. **Psychosocial issues pre-transplant and pre-MCS**
  - a. Substance abuse
  - b. Support systems and identification of caregivers
  - c. Patient and family education
  - d. Postop management
4. **Hot topics in evaluation**

- a. **Frailty**
- b. **Financial assessment and coverage**
- c. **Upcoming changes to UNOS listings**
- d. **New programs – how to share knowledge between**

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### *Section 3: Caring for the listed patient*

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Learning Objectives for Section 3:

- 1) To understand the process of organ allocation and patient listing
- 2) To increase knowledge about transplant immunology and key components of the immune system that influence transplantation
- 3) To establish risk factors of sensitization and mechanisms for desensitization
- 4) To learn appropriate monitoring strategies of antibodies pre and post-transplant
- 5) To understand specific transplant challenges through case scenarios

1. **Listing and collaboration: Transplant/MCS Coordinators and patients**
  - a. Listing criteria
  - b. Changes to heart allocation
  - c. Change to listing for MCS patients
  - d. LAS
  - e. Global heart/lung allocation schema
  - f. Living while waiting
2. **Immunology 101**
  - a. The concept of self and non-self
  - b. The key components of the immune system
  - c. What parts of this are important in transplantation?
3. **Managing patients with anti HLA antibodies and desensitization therapies**
  - a. Risk factors for development of anti -HLA Ab
  - b. Mechanism of action of desensitization strategies
  - c. Monitoring of anti-HLA Ab pre-transplant
  - d. Assessing for donor-specific Ab post-transplant
4. **Audience interactive session**

Panelists to propose case scenarios:

  - a. Donor is CDC high risk, how does your selection and care of recipient differ from SCD
  - b. Listed heart transplant candidate with MCS discloses to MCS coordinator ambivalence about transplant
  - c. Listed MCS patient with high antibody titers
  - d. Patients from states where cannabis is legal who are presenting for evaluation at a center where usage is illegal
  - e. Young ill patient with a BMI of 40 who is chronically hemodynamically unstable but with a VO2 that does not meet CMS criteria

#### **Recommended reading**

#### **Collaboration between Heart Transplant and MCS Coordinators c Patients on MCS Devices**

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## ***Section 4: Transplant Management***

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Learning Objectives for Section 4:

- 1) Describe the role of the coordinator in donor evaluation and management and procurement of cardiothoracic organs
- 2) To understand contraindications for organ procurement
- 4) To explore the use of OCS and EVLP in organ procurement
- 3) To learn about induction and maintenance in immunosuppression
- 4) To establish common side effects associated with immunosuppression
- 5) To gain an awareness of different transplant management strategies between programs

### **1. The heart and lung donor**

- a. **Multiple priorities of the procurement transplant coordinator**
- b. **Determining suitability of thoracic organs for transplantation**
- c. **Factors that determine donor-recipient matching**
- d. **How assessment and coordination of SCD and DCD donors differ**
- e. **Contraindications for heart transplant**
- f. **Contraindications for lung transplant**
- g. **Use of OCS and ex vivo lung perfusion**

### **2. Immunosuppression: Induction and Maintenance**

- a. **Induction - what is it and why are there differences between sites?**
- b. **Which drugs are used to maintain the graft?**
- c. **Common side-effects and what to do if your patient has them**

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Heeger PS, Dinavahi R. (2012) Transplant immunology for non-immunologist. *Mount Sinai Journal of Medicine*. 79(3): 376-87.

## ***Section 5: MCS Management***

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Learning Objectives for Section 5:

- 1) To establish the different types of mechanical circulatory support options presently available
- 2) To appreciate the differences between long-term and short-term mechanical circulatory support
- 3) To understand complications that can result from mechanical circulatory support
- 4) To learn how to identify and address common complications resulting from mechanical circulatory support

1. Devices
  - a. LVADs (HeartWare, HeartMate II, HeartMate III, others)
  - b. TAHs
  - c. Centrimags, IABP, impella, others
  - d. ECMO
2. Complications overview
  - a. Bleeding
  - b. Clotting
  - c. Infection
  - d. Right heart failure

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## ***Section 6: Immediate Post Transplant Care***

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Learning Objectives for Section 6:

- 1) To understand Primary Graft Dysfunction: characteristics and treatment modalities
- 2) To describe the difference between acute cellular rejection and antibody mediated rejection and respective management strategies
- 3) To explore teaching strategies to promote patient and caregiver learning
- 4) To understand follow-up care after transplantation

### **1. PGD: definitions and treatment**

- a. ICU management
- b. Surgical and Medical Complications
- c. Prophylactic Regimen
- d. Immunosuppression therapy ( covered in previous section)

### **2. Management of Acute Cellular Rejection and Antibody Mediated Rejection**

- a. Definitions of acute cellular rejection and antibody mediated rejection
- b. Management strategies of acute cellular rejection
- c. Management strategies of antibody mediated rejection

### **3. Post-Transplant Heart and Lung Recipient and Caregiver Education**

- a. Medication teaching
- b. Signs and symptoms of infection and rejection
  - o Heart
  - o Lung
- c. Monitoring for infection, rejection and changes in medical status
- d. Follow up care post discharge

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## ***Section 7: Care of the Patient with Special Needs***

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Learning Objectives for Section 7:

- 1) To understand the relevance of social support and socioeconomic status in patient care
- 2) To be able to determine health literacy and track patient adherence
- 3) To appreciate challenges resulting from low health literacy
- 4) To describe specific considerations in the management of the different age groups of transplant recipients
- 5) To learn about care of the older aged patient
- 6) To understand opportunities and challenges the role poses

1. **Poor social support and low socioeconomic status**
  - a. **Importance of social support**
  - b. **Why is socioeconomic status important?**
  - c. **Key principles in caring for these patients**
2. **Low health literacy and adherence**
  - a. **Overview of health literacy and why it's important**
  - b. **How to determine level of health literacy**
  - c. **Strategies to improve and track adherence**
3. **Care of the Very Young, School Age and Adolescent**
  - a. **What's different about the 3 age groups?**
  - b. **What are some key concepts in managing each group?**
  - c. **A short discussion about transitions**
4. **Care of the older aged patient**
  - a. **What defines older age?**
  - b. **Outcomes in the elderly, comorbidities, and impact on care**
  - c. **Long-term issues, death of caregiver, increasing medical needs**

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## ***Section 8: Long Term Follow Up***

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Learning Objectives for Section 8:

- 1) To establish recommendations for surveillance of the post transplant patient
- 2) To identify strategies to allow for return to work and school
- 3) To learn how to help patient achieve an acceptable quality of life
- 4) To learn common infections and malignancies as well as their treatment and prevention
- 5) To understand chronic rejection: symptoms and treatment, symptoms of rejection, and treatment

1. **Follow up surveillance program (include common complications)**
  - a. **Current recommendations**
  - b. **Role of the surveillance biopsy**
  - c. **Non-transplant complications, frequencies, and treatment strategies**
2. **Return to work, school and quality of life**
  - a. **Barriers to return to normal activities**
  - b. **Strategies to facilitate successful reintegration into the community**
  - c. **Return to school issues**
  - d. **Achieving acceptable quality of life**
3. **Infection and malignancy**
  - a. **Common infections and their timing in the post-transplant period and in MCS D patients supported for long term**
  - b. **Prevention and treatment of infections**
  - c. **Malignancy Risk**
  - d. **Prevention and treatment of malignancy**
4. **Chronic rejection: BOS and CAV**
  - a. **Signs and symptoms**
  - b. **Current treatment strategies**
  - c. **Re-transplantation**

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## ***Section 9: Quality***

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Learning Objectives for Section 9:

- 1) To learn about the variety of regulatory agencies to assess hospital practices
- 2) To establish performance improvement recommendations
- 3) To identify program metrics to consider evaluating and how to plan for improvement
- 4) To understand the importance of readmissions and their impact on a program
- 5) To be able to identify a multidisciplinary approach to patient care

### **1. Quality assurance and interprofessional collaborative practice**

- a. **Regulatory agencies (Intermacs, Joint Commission, DNV, UNOS, CMS, etc)**
- b. **Performance improvement and collaborative practice**
- c. **Evaluating outcomes and developing plan for improvement**
- d. **Rewards identified by caregivers for performing the role**

### **2. Readmissions**

- a. **Tracking trends at your institution and benchmark against national trends**
- b. **How to strategically say “no” and role of delegation and education for others**
- c. **Engagement of consulting services and multidisciplinary approach**
- d. **Develop plan for improvement**

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## ***Section 10: Caring for Ourselves and Others***

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Learning Objectives for Section 10:

- 1) To establish strategies to provide support for caregivers of patients
- 2) To appreciate ethical challenges and role of palliative care at the end of life
- 3) To understand strategies for career development
- 4) To identify work-life balance strategies and time management techniques
- 5) To learn about the importance of networking

### **1. Care for the caregivers**

- e. **Demographics of those who provide care for MCS and transplant patients**
- f. **The caregiver experience pre-transplant and post-transplant**
- g. **Interventions for struggling caregivers**
- h. **Rewards identified by caregivers for performing the role**

### **2. Caring at the end of life**

- a. **Involvement of palliative care providers for transplant and MCS**
- b. **Ethical and practical challenges of offering hope while also helping patients and families to prepare for end of life**
- c. **Specific palliative interventions that can be of benefit to thoracic transplant patients.**

### **3. Career development strategies for MCS and transplant professionals**

- a. **Outline steps along a potential career path for a transplant professional**
- b. **Describe strategies to prepare for a career in transplantation**
- c. **How do we stimulate interest in others for a transplant career to provide for controlled succession planning?**
- d. **Growing the network – helping others to become active in transplant organizations like ISHLT, ICCAC, NHA, etc.**

### **4. Work-life balance for the MCS and transplant professional – making it all work**

- e. **Strategies to define work-life balance for the individual**
- f. **How to strategically say “no” and role of delegation and education for others**
- g. **Time management**
- h. **Stress relief**

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