



## FACULTY OF PATHOLOGY

ROYAL COLLEGE OF  
PHYSICIANS OF IRELAND

Post CSCST Training in

# CLINICAL MICROBIOLOGY Heart & Lung Transplantation & Mechanical Circulatory Support



**This curriculum of training in Clinical Microbiology, Heart and Lung Transplant was developed in 2017 and undergoes an annual review by Prof Edmond Smyth National Specialty Director, Dr Ann O'Shaughnessy, Head of Education, Innovation & Research and by the Clinical Microbiology Training Committee. The curriculum is approved by the Faculty of Pathology.**

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**Table of Contents**

|   |           |
|---|-----------|
| <b>INTRODUCTION .....</b>   | <b>4</b>  |
| ENTRY REQUIREMENTS .....  | 4         |
| RECRUITMENT AND SELECTION .....   | 4         |
| DURATION AND ORGANISATION OF TRAINING .....   | 4         |
| TRAINING PROGRAMME.....   | 4         |
| TRAINEE NUMBERS .....   | 5         |
| EPORTFOLIO .....  | 5         |
| PROGRAMME MANAGEMENT .....  | 5         |
| <b>SPECIALTY SECTION .....</b>  | <b>6</b>  |
| BASIC SCIENTIFIC PRINCIPLES .....   | 6         |
| LIFESTYLE .....   | 7         |
| EPIDEMIOLOGY AND PUBLIC HEALTH .....  | 8         |
| SPECIAL GROUPS – ADULTS WITH SPECIAL RISK FACTORS .....   | 9         |
| LABORATORY/SPECIFIC AREA .....  | 10        |
| SOLID ORGAN TRANSPLANT WARD/HEART AND LUNG TRANSPLANTATION WARD AND CARDIOTHORACIC WARD AND ICU ..... | 11        |
| OTHER CO-MORBIDITIES.....   | 12        |
| CLINICAL ASSESSMENT.....  | 13        |
| MANAGEMENT AND TREATMENT OPTIONS.....   | 14        |
| <b>DOCUMENTATION OF MINIMUM REQUIREMENTS FOR TRAINING .....</b>                                       | <b>15</b> |

## Introduction

Heart and Lung Transplant Microbiology is the specialty concerned with the prevention, diagnosis and treatment of infectious diseases in patients undergoing Heart and Lung Transplantation. Mechanical Circulatory Support (MCS) is also included in this subspecialty as it has become a recognized treatment for patients with advanced heart failure, who may not be eligible for Heart Transplantation or may be a bridge to Heart Transplant, or heart Transplant candidacy. Heart transplantation in Ireland was developed in the 1980's and Lung Transplantation in 2005. Cystic fibrosis Lung Transplantation followed later in 2010 and since 2010 over 120 Lung Transplants have been carried out in the MMUH with recent figures rising to circa 40 Lung Transplants and 20 Heart Transplant being carried out per annum. This growing program provides a unique opportunity for a fellowship in Heart, Lung and Mechanical Circulatory Support (MCS) Transplant Microbiology at the National Heart and Lung Transplant Centre, at the Mater University Hospital, Dublin.

## Entry Requirements

Applicants for the Post CSCST Fellowship in Heart, and Lung and Transplant Microbiology will have successfully completed the RCPI Higher Specialist Training programme in Clinical Microbiology within two years of the start date of the Post CSCST Fellowship programme.

Prior experience in Heart, and Lung and Transplant Microbiology during Clinical Microbiology training would be an advantage.

## Recruitment and Selection

Post CSCST Fellowship training in Heart, and Lung and Transplant Microbiology will build on broad basic and early core specialist training in Clinical Training. This is in line with training models internationally. Selection of candidates for Post CSCST Fellowship training in Heart, and Lung and Transplant Microbiology will be via a competitive recruitment process coordinated by the relevant Training Body. Recruitment will follow similar timeline where possible to HST recruitment and post will commence in July of each year (unless otherwise specified).

## Duration and Organisation of Training

The Post CSCST Fellowship in Heart, and Lung and Transplant Microbiology is a one year training programme designed to dovetail with the Irish Higher Specialist Training programme in Clinical Microbiology. The curriculum is competency-based, however it is anticipated that the candidate will complete training within one year.

The curriculum takes into account the major areas of competence required by the subspecialist in Heart, and Lung and Transplant Microbiology and will be supervised by the Faculty of Pathology of the Royal College of Physicians in Ireland. Doctors who have successfully completed the RCPI Higher Specialist Training programme in Clinical Microbiology and are within two years of completion will be deemed eligible to apply for the Post CSCST Fellowship in Heart, and Lung and Transplant Microbiology. Completion of this program will ensure the knowledge and competencies in all areas of the curriculum, meeting international standards for best practice and allowing candidates to practice as a subspecialist in Heart, and Lung and Transplant Microbiology.

## Training Programme

The training programme offered will provide opportunities to fulfil all the requirements of the curriculum of training for Heart, and Lung and Transplant Microbiology in approved training hospitals. Each post within the programme will have a named trainer/educational supervisor and the programme will be under the direction of the National Specialty Director for Clinical Microbiology

## Trainee Numbers

It is expected that the Post CSCST Fellowship in Heart, and Lung and Transplant Microbiology will be awarded to one candidate per year.

## ePortfolio

The trainee will be required to keep their ePortfolio up to date and maintained throughout their Fellowship training. The ePortfolio will be countersigned as appropriate by the Trainer to confirm the satisfactory fulfilment of the required training experience and the acquisition of the competencies set out in the Curriculum. This will remain the property of the Trainee and must be produced at the end of year Evaluation meeting. At the end of year Evaluation, the ePortfolio will be examined. The results of any assessments and reports by the named trainer/educational supervisor, together with other material capable of confirming the trainee's achievements, will be reviewed.

## Programme Management

- Coordination of the training programme will lie with the Medical Training Department.
- The training year will usually run from July to July in line with HST programmes
- Annual evaluations will usually take place between April and June each year
- Each trainee will be registered to the ePortfolio and will be expected to fulfil all requirements relating to the management of yearly training records
- Opportunities for audit and research may be available
- Each trainee will be issued with a training agreement on appointment to the training programme and will be required to adhere to all policies and procedures relating to Post CSCST Fellowships.

## Specialty Section

### Basic Scientific Principles

**Objective:** To be expert on the diagnosis and interpretation of diagnostic methods and interpretation in transplantation medicine infectious complications

#### KNOWLEDGE

- Diagnosis of transplantation medicine infectious complications
- Knowledge of medical management of Patients With Cystic Fibrosis(PWCF)
- Interpretation of diagnosis methods
- Knowledge of preventing infection in at risk patients

#### SKILLS

- Assessment and evaluation of patients undergoing heart and lung transplantation or mechanical circulatory support and of patients with Cystic Fibrosis undergoing lung transplantation and their related infections

#### ASSESSMENT & LEARNING METHODS

- Communication course
- Prepare and present a lecture / update of the current data :
- to hospital physicians
- to allied health professional
- Feedback from people attending presentations

## Lifestyle

**Objective:** To be familiar with the data and knowledge gaps regarding potential causes and/or complications of transplant related infection illness.

To be aware of the clinical trials describing the prevention of infections in the post-transplant era on morbidity and mortality.

### KNOWLEDGE

- Familiarity with the data and knowledge gaps regarding potential causes and/or complications of transplant related infection illness
- Aware of the clinical trials describing the prevention of infections in the post-transplant era on morbidity and mortality
- Aware of the risks of infection associated with transplant tourist and prevention of infection advice for patients who might be travelling
- Aware of the vaccine preventable infectious diseases in Heart and Lung Transplantation and MCS

### SKILLS

- Advise on health promotion

### ASSESSMENT & LEARNING METHODS

- Write a review, patient information booklet regarding post transplantation related infections prevention
- Review national and international guidance documents considering quality of available evidence

## Epidemiology and Public Health

**Objective:** To be familiar with national outbreaks and epidemics and effect on transplant program patients.

To be familiar with current interventions to mitigate the adverse consequences of the infections pre and post-transplant era for patients.

### KNOWLEDGE

- National outbreaks and epidemics and effect on transplant program patients e.g.RSV and Influenza in Lung Transplantation.
- Current interventions to mitigate the adverse consequences of the infections pre and post-transplant era for patients.

### SKILLS

- Analysis and interpretation of epidemiological data
- Audit Surgical Site Infection and other Public Health related infections, create a report, and complete the audit cycle
- Multidisciplinary team working
- Awareness of public health policies

### ASSESSMENT & LEARNING METHODS

- Multidisciplinary team meetings
- Attend interactions between HPSC, outbreak meetings
- Research meetings and preparing manuscripts for publication where appropriate
- Complete audit

## Special Groups – Adults with special risk factors

**Objective:** To become competent in working clinically with adults with specific risk factors. To review pre-transplant specific special risk groups, e.g. patients colonized with MDROs, Toxoplasmosis, CMV, EBV, Hepatitis B and C, HIV and recurrent *Clostridium difficile*. To review patients with Cystic Fibrosis and the organisms they are colonized with including *Mycobacterium abscessus*, organisms, *Aspergillus* sp, Pan-resistant *Pseudomonas aeruginosa* and *Burkholderia cepacia*.

### KNOWLEDGE

- Pre-transplant specific issues in specific risk groups, e.g. patients with CF patients colonized with MDROs, *Mycobacterium abscessus*, *Aspergillus* sp, *Burkholderia* sp, and Bloodbourne viruses and or recurrent *Clostridium difficile*

### SKILLS

- Provide interventions to prevent infectious complications in these groups

### ASSESSMENT & LEARNING METHODS

- MDTs, patient listing on Friday morning and patients management on Tuesday morning
- Cystic Fibrosis OPD and vaccination clinic
- Daily MDT ward rounds

## Laboratory/Specific Area

**Objective:** To be able to apply an evidence-based approach to the management of patients with infections (fungal, bacterial, parasitic or viral), including Multi-drug resistant isolates (MDRO`S).

### KNOWLEDGE

- Evidence-based approach to the management of fungal risk in patients undergoing solid organ transplantation (SOT) and MCS
- Evidence-based approach to the management of patients with bacterial infections, including Multi-drug resistant isolates (MDRO`S)
- Evidence-based approach to the screening for and management of parasitic infections in SOT and MCS patients
- Evidence-based approach to the management and prevention of viral infections in SOT and patients in liaison with NVRL.

### SKILLS

- Manage fungal infection using EORTC guidelines
- Recognize and understand the role of laboratory in management of infections.
- Advise on methods to reduce risk e.g. antimicrobial transplant stewardship and environmental measures and role of surveillance and reductions measures
- Advise and recommend vaccination at the vaccination assessment clinic
- Review and develop SOPs to ensure prevention of parasitic infections
- Provide medical management to patients with parasitic infections
- Appropriate referral to specialists
- Screening, assessment and management of viral disease in SOT and MCS patients in liaison with NVRL.
- Early intervention in viral disease to prevent progression
- Provide medical management for SOT and MCS patients in liaison with NVRL.

### ASSESSMENT & LEARNING METHODS

- MDT meetings
- Attend courses:
  - NEQAS Mycology course
  - ESHLT, ISHLT and , ESCMID
- Attend departmental IPC committee meetings
- Attend department Antimicrobial stewardship meetings
- Attend laboratory Senior management meetings
- Attend Heart, Lung and Transplant and MCS MDTs
- Meetings with consultant virologist

## **Solid Organ Transplant Ward/Heart and Lung Transplantation Ward and Cardiothoracic Ward and ICU**

**Objective:** To understand the infrastructural and physical requirements of an inpatient or day ward for transplant patients to prevent acquisition of infection

### **KNOWLEDGE**

- Evidence-based approach to infection prevention and control in SOT patients and MCS patients based on national and international guidance

### **SKILLS**

- Ability to assess suitability of physical environment and work flow practices and to make recommendations in line with best practices for the prevention of infection in this setting

### **ASSESSMENT & LEARNING METHODS**

- Twice weekly MDT meetings
- Daily transplant antimicrobial stewardship ward rounds

## Other co-morbidities

**Objective:** To be able to apply an evidence-based approach to the management of, and prevention of infection related treatments in patients with specific comorbidities e.g. liver, GI and renal failure and patients with Cystic Fibrosis.

### KNOWLEDGE

- Evidence-based approach to the management and prevention of infection in transplant patients with specific comorbidities e.g. liver and renal failure, and obesity and patients with Cystic Fibrosis etc.

### SKILLS

- Provide antimicrobial advice management of people with comorbidities liver and renal failure etc.

### ASSESSMENT & LEARNING METHODS

- MDT meetings
- Develop in conjunction with pharmacists protocols to manage infections with patients with co-morbidities

## Clinical Assessment

**Objective:** To be competent in the assessment of patients with infections in the pre to post transplant period

### KNOWLEDGE

- How to assess patients with infections in the pre- to post-transplant period

### SKILLS

- Carry out a physical examination with special focus on infection related challenges
- Appropriate screening for infection related illnesses
- Identification and treatment of transplant related infections

### ASSESSMENT & LEARNING METHODS

- Attend wards
- Attend Heart and Lung /MCS/CTS/ICU/Micro MDTs

## Management and Treatment Options

**Objective:** To become competent in the management and the most appropriate treatment of all infectious complications in SOT patients and MCS patients.

### KNOWLEDGE

- The associations between antimicrobial choice and infection management of patients with transplant related infections
- The prescription of antimicrobials for treatment, prevention and prophylaxis of infection in transplant patient cohort
- Awareness of new emerging therapies e.g. FMT role in transplant patients
- The associations between colonization with MDRO and subsequent development and treatment of infection
- The associations between behavior modification with prevention of infection post-transplant

### SKILLS

- Provide information to patients on the indications, contra-indications, risks, alternatives and benefits of antimicrobials.
- Assess newer antimicrobials for use in transplant patients.
- Develop an application algorithm in transplant patients.
- Choose appropriately for agent dosing and titration and therapeutic monitoring.
- Carry out SWOT analysis of laboratory input to transplant programme and set SMART goals in attainment.
- Promote policies and procedures that reduce and prevent infection.
- Advocate for the prevention of infection, develop contingencies and identify potential future challenges/threats.
- Advocate for the prevention of infection in transplant unit.

### ASSESSMENT & LEARNING METHODS

- MDT meetings
- Undertake AMS audits
- Inpatient management
- Laboratory based project
- Develop guidelines for foreign travel in the post-transplant period
- Committee attendance
- Review of policies and procedures

## Documentation of Minimum Requirements for Training

- These are the minimum number of cases you are asked to document as part of your training. It is recommended you seek opportunities to attain a higher level of exposure as part of your self-directed learning and development of expertise.
- You should expect the demands of your post to exceed the minimum required number of cases documented for training.
- If you are having difficulty meeting a particular requirement, please contact your specialty coordinator.

| Curriculum Requirement  | Required/Desirable | Minimum Requirement | Reporting Period   | Form Number |
|---|--------------------|---------------------|--------------------|-------------|
| <b>Section 1 - Training Plan</b>  |                    |                     |                    |             |
| <b>Personal Goals Plan</b> (Copy of agreed Training Plan for your current training year signed by both Trainee & Trainer) | Required           | 1                   | Training Programme | Form 052    |
| <b>Personal Goals Review Form</b>   | Required           | 1                   | Training Programme | Form 137    |
| <b>Weekly Timetable</b> (Sample Weekly Timetable for Post/Clinical Attachment)  | Required           | 1                   | Training Programme | Form 045    |
| <b>Section 2 - Training Activities</b>  |                    |                     |                    |             |
| <b>Outpatient Clinics</b>   |                    |                     |                    |             |
| Heart and Lung Transplant outpatient clinics  | Required           | 5                   | Training Programme | Form 001    |
| Vaccination clinic for patients pre-transplant and post-transplant  | Required           | 1                   | Training Programme | Form 001    |
| CF outpatient clinics   | Desirable          | 5                   | Training Programme | Form 001    |
| <b>Ward Rounds</b>  |                    |                     |                    |             |
| Heart/Lung Transplantation and MCS  | Required           | 20                  | Training Programme | Form 002    |
| ICU, HDU and CTHDU  | Required           | 20                  | Training Programme | Form 002    |
| Cardiothoracic  | Required           | 20                  | Training Programme | Form 002    |
| <b>On call /dealing with queries of Transplantation Medicine and Clinical Microbiology</b>                                | Desirable          | 50                  | Training Programme | Form 003    |
| <b>Additional/Special Experience Gained- Clinical Microsystems QI training ( depending on availability)</b>               | Desirable          | 1                   | Training Programme | Form 005    |
| Attachment with National Transplant Co-ordinator  | Desirable          | 1                   | Training Programme | Form 006    |
| <b>Section 3 - Educational Activities</b>   |                    |                     |                    |             |
| <b>Mandatory Courses</b>  |                    |                     |                    |             |
| Observership in Clinical Virology, NVRL   | Required           | 5                   | Training Programme | Form 006    |
| Transplant ID Course ISHLT course   | Desirable          | 2                   | Training Programme | Form 006    |
| Patient Survey  | Required           | 1                   | Training Programme | Form 006    |
| Patient booklet /App  | Desirable          | 1                   | Training Programme | Form 006    |

| Curriculum Requirement  | Required/Desirable | Minimum Requirement | Reporting Period   | Form Number |
|---|--------------------|---------------------|--------------------|-------------|
| <b>Non – Mandatory Courses</b>  |                    |                     |                    |             |
| Viral Infections in Immunocompromised host ESCMID Course  | Desirable          | 1                   | Training Programme | Form 007    |
| <b>In-house activities</b>  |                    |                     |                    |             |
| Journal Club  | Required           | 10                  | Training Programme | Form 011    |
| MDT Meetings  | Required           | 30                  | Training Programme | Form 011    |
| One to one meetings with transplant coordinator   | Required           | 3                   | Training Programme | Form 011    |
| Participate in ongoing local and new infection related research projects in the Heart and Lung Transplant program | Required           | 1                   | Training Programme | Form 011    |
| <b>Examinations</b>   | Desirable          | 1                   | Training Programme | Form 012    |
| <b>Formal Teaching Activity (1 per month)</b>   |                    |                     |                    |             |
| Lecture   | Required           | 4                   | Training Programme | Form 013    |
| Tutorial  | Required           | 4                   | Training Programme | Form 013    |
| <b>Research</b>   | Desirable          | 1                   | Training Programme | Form 014    |
| <b>Audit activities/QIP</b>   |                    |                     | Training Programme |             |
| <b>HODW /Transplantation and ward processes audits and Quality Improvement programmes</b>                         | Required           | 9                   |                    | Form 015    |
| <b>Clinical Audit Report form</b>   | Required           | 3                   | Training Programme | Form 135    |
| <b>Publications</b>   | Desirable          | 1                   | Training Programme | Form 016    |
| <b>Presentations</b>  | Desirable          | 5                   | Training Programme | Form 017    |
| <b>National/International meetings, ESHLT and ISHLT</b>   | Desirable          | 1                   | Training Programme | Form 010    |
| <b>Additional Qualifications</b>  | Desirable          | 1                   | Training Programme | Form 065    |
| <b>Committee Attendance</b>   | Required           | 3                   | Training Programme | Form 063    |
| <b>Section 4 - Assessments</b>  |                    |                     |                    |             |
| <b>CBD</b>  | Required           | 1                   | Training Programme | Form 020    |
| <b>Quarterly Assessments</b>  | Required           | 4                   | Training Programme | Form 092    |
| <b>End-of-Post/End-of-Year Assessments</b>  | Required           | 1                   | Training Programme | Form 092    |