

Post-doctoral Certificate Course in Infectious
Diseases
Department of Microbiology



All India Institute of Medical Sciences (AIIMS)
Jodhpur, Rajasthan, India

Syllabus for Post-doctoral Certificate Course in Infectious Diseases

Introduction:

Microbiology is the scientific discipline that examines microbes and microbial diseases. Microbes, that require microscopic tools for visualization, encompass bacteria, viruses, fungi and parasites. Antimicrobial therapies, vaccines, hygiene and antiseptic techniques are intellectual achievements that represent foundations for the current medical microbiology revolution. Apart from the contributions of Microbiology to human health, the foundations of modern molecular biology and genetics rest on research carried out with microbiology. The Department of Microbiology has taken its existence in February 2013 at AIIMS, Jodhpur. Microbiology department bridges between diagnostic clinical microbiology and modern molecular biology with research on infectious disease and immunology. The department consists of a vibrant community of faculty, residents, technicians and other staff.

At present the department has one Professor, one Additional, one Associate professor and two Assistant Professor, Six Senior Residents, and seven working staff members including technical Assistants. All members of the department continue a long tradition of making outstanding contributions to the field of microbiology and medicine.

Definition:

As Infectious disease are a major killer in the developing world including India, there is a need to create experts in the field. Therefore, we propose a course of one year for post MD training which would be targeted for the senior residents/ young faculty members / state medical doctors who are actively involved in teaching under graduate and post graduate students along with diagnosis and management of patients with infections. The superspeciality nature of our Institute will suit to start the above course in order to meet the challenges of infectious diseases. Having the basic knowledge of Microbiology, the trainees will be able to tackle the problems of infectious diseases including the emerging and reemerging ones in a better way.

Aim & Objectives of the training:

AIM:

The aim of the course is to train doctors, so as to provide a well-supervised expertise in the field of infectious diseases.

Objectives:

1. To create experts who can diagnose and treat patients with infectious diseases. This includes specific management of infectious diseases.
2. To develop laboratory skills to carry out and report on investigations in patients with infectious discuss including the unusual one.
3. To promote the importance of excellence in teaching and research in infectious diseases.
4. To provide thorough knowledge about the epidemiology and control of hospital infections.

Organization of Training:

Course Content:

1. Core Unit

The course would consist of 3 semesters of 4 months each. All semesters will have intensive course of lectures, clinical, practical including hands on training & demonstrations.

Semester 1 (Duration - 4 month)

Basic Knowledge

The clinical microbiology with the principles of infection. This will consist of basic reading of microbiology and its clinical application in infectious diseases. This will provide the knowledge to interpret the basic laboratory data in respect to the infectious complications caused by the organism.

Semester 2 (Duration- 4 month)

Infection control in related conditions: To gain clinical experience and acquire knowledge about diagnosis and management of infections caused by all types of microbial agents. The resident will see patients with infectious disease during this course.

Semester 3 (Duration - 4 month)

Hospital hygiene, epidemiology and infection control: This topic includes: surveillance, audit, policy design and review, aspects of management, relevant epidemiological skills, outbreak control and prevention, organism typing, antibiotic prescribing, an introduction to hospital hygiene, legal and socio-economic aspects of hospital infection, the interface between the community and the hospital, and other important topics in hospital infection such as infections on the intensive care unit and in the immunosuppressed individuals.

Assessment of training: -

The candidates are expected to maintain a logbook of minimum fifty (4X12 specialty) clinical cases reports of the patients diagnosed and treated for infectious diseases in the hospital of AIIMS Jodhpur. In addition, each candidate will undergo laboratory assessment periodically by the faculty of the department following Institute procedure in this regard. The result of the internal assessment will be made available to the examiners at the time of examination. At the end of 12 calendar months there will be a certifying examination both theory as well as practical as per Institute guidelines.

Training programme syllabus:-

1. Basic laboratory techniques in bacteriology
 - 1.1 Culture techniques
 - 1.2 Maintenance of stock culture.
 - 1.3 Storage of chemotherapeutic agents and antibiotic assays
 - 1.4 Techniques of Air, water food and OT samples surveillance
2. Basic laboratory techniques in Virology
3. Basic laboratory techniques in Mycology
 - 3.1 Culture isolation and identification techniques for fungus.
4. Basic laboratory techniques in Parasitology
 - 4.1 Smear examination and culture techniques
 - 4.2 Newer rapid diagnostic techniques
5. Basic laboratory techniques in Immunology
6. Culture isolation and identification techniques for Mycobacteria.
7. Fundamentals of Microbiology including molecular biology
 - 7.1 Safety measures and use of bio-safety cabinets
 - 7.2 Quality control, quality assurance

- 7.3 Sterilization and disinfections in the laboratory and wards
- 7.4 Epidemiological surveillance of diseases
- 7.5 Pathogenesis of infectious diseases
- 7.6 Biological standardization
- 7.7 Bio-statistics for analysis of lab results
- 7.8 Computerization of lab data and reporting
- 8. Automation in Microbiology e.g. BACTEC culture and sensitivity techniques

Clinical Course:

- i. Diagnosis & management of pyrexia of unknown origin (PUO)
- ii. Diagnosis & management of acquired immunodeficiency syndrome (AIDS).
- iii. Antifungal/ antimicrobial prophylaxis during neutropenia & immunodeficiency.
- iv. Diagnosis & management of bacteremia & fungemia.
- v. Pathogenesis of infections related to intravascular catheterization & their management.
- vi. Pathogenesis, pathophysiology diagnosis & management of CNS infections.
- vii. Management & diagnosis of acute flaccid paralysis including Guillain-Barre syndrome.
- viii. Diagnosis & management of acute rashes and eruptions.
- ix. Diagnosis & management of acute respiratory infection.
- x. Transplant associated infections (Kidney & BMT, Liver transplant)
- xi. Diagnosis & management of ventilator associated respiratory infection.
- xii. Diagnosis & management of upper gastrointestinal tract infection.
- xiii. Diagnosis & management of acute and chronic diarrhea, gastroenteritis.
- xiv. Collection of USG guided samples & investigation.
- xv. Diagnosis and Management of deep seated chronic infections.
- xvi. Diagnosis and Management of infection in comatose patients/ infected road accidents.
- xvii. Diagnosis and Management of sexually transmitted and pelvic inflammatory diseases.
- xviii. Diagnosis and management of all post-operative infection.
- xix. Diagnosis & management of infection in cancer patients.
- xx. Diagnosis & management of infection in patient with acute leukemia and lymphoma.
- xxi. Infection in the elderly.
- xxii. Infection acquired directly or indirectly from animals or from arthropod vectors.
- xxiii. Immunology of infectious disease.

Infrastructure: The laboratory is well equipped with automated & other required equipment as per annexure-1. Few of the important equipment are listed below-

- a) Micro scan Walkaway for automated identification & antimicrobial susceptibility testing.
- b) CO₂ Incubator
- c) BACTEC
- d) BacT Alert
- e) LPA
- f) PCR
- g) COLD ROOM

h) BOD Incubator

Duration and Rotation:

The course consists of 12 month duration with 3 semesters of 4 months each.

Semester 1 (Duration - 4 month): The clinical microbiology with the principles of infection.

Semester 2 (Duration- 4 month): diagnosis and management of infectious diseases

Semester 3 (Duration - 4 month): Hospital hygiene, epidemiology and infection control

Total: one year

Supervision:

Initially, the trainee will be fully supervised by the Faculty posted in the area. In the course of training, the level of supervision will be tapered according to the experience and confidence gained.

Overview of training

Clinical knowledge will be acquired by a variety of means, including close liaison with appropriate medical and surgical and radiological meetings. The following inter-relationships will be maintained through multidisciplinary meetings in form of short clinics:

- Microbiology
- Medicine
- Pediatrics
- Gastroenterology and hepatobiliary
- General surgery
- Oncology and Hematology
- Hospital Infection Control & BMW Programme
- Critical care medicine
- Pulmonary Medicine
- Dermatology, venerology & Leprology

i. The trainee would be encouraged and given the opportunity to attend and lead appropriate clinical correlation of infectious diseases in multidisciplinary meetings.

ii. The trainee would be encouraged to attend appropriate educational meetings and courses.

iii. The trainee would participate in and initiate relevant clinical audit.

iv. Trainees will be expected to be familiar with recent advances in infectious disease and follow the guidelines for diagnosis & management of diseases.

v. The trainee would be encouraged to participate in research, and to pursue one or more projects up to and including publication. An understanding of the principles and techniques used in research, including the value of clinical trials and basic biostatistics, should be acquired. Presentation of research and audit results at state and national meetings would be encouraged.

vi. The trainee would continue to participate in the on-call rotation duties as per department duty roster.

vii. Procedural competence will need to be reviewed at intervals, and this regular review should also assess the number of cases required in order to ensure competence.

The academic activities of the program in the hospital would include :-

1. Regular academic sessions
2. Case discussion and seminar

3. Journal club
4. Conferences / CMEs / Live workshops

Research:

1. See 20 cases of quality analysing and discussing which will be certified by the faculty of the department.
2. Present at one regional and one national conference.

- Participate in the daily teaching sessions within the department, and make regular presentations.
- Take part in Inter-departmental meetings relevant to the area posted.

To sum up:

The goal of the Post-doctoral Certificate Course in Infectious Diseases is-

1. To create experts who can diagnose and treat patients with infectious diseases. This includes specific management of infectious diseases.
2. To develop laboratory skills to carry out and report on investigations in patients with infectious diseases including the unusual one.
3. To promote the importance of excellence in teaching and research in infectious diseases.
4. To provide thorough knowledge about the epidemiology and control of hospital infections.

Recommended Reading

S No	Name of Book	Author	Publisher
1	Clinical Mycology with CD ROM	Elias J. Anaissie, Michael R. McGinnis, Michael A. Pfaller	Churchill Livingstone
2	Fundamental Medical Mycology	Errol Reiss, H. Jean Shadomy, G. Marshall Lyon	Wiley-Blackwell
3	Medically Important Fungi: A Guide to Identification	Davise H. Larone	American society for Microbiology press
4	Atlas of Tropical Medicine and Parasitology: Text with CD-ROM,	Wallace Peters, Geoffrey Pasvol	Mosby
5	Bailey & Scott's Diagnostic Microbiology	Patricia M Tille	Mosby
6	Clinical Immunology and Serology: A Laboratory Perspective	Christine Dorresteyn Stevens	F.A. Davis Company
7	Koneman's Colour Atlas and Text book of Diagnostic Microbiology	Washington C. Winn , Stephen D. Allen , Stephen Allen , William M Janda et al	Lipincott William and Wilkins
8	Mackie and McCartney Practical Medical Microbiology	J G Colle et al	Elsevier
9	Clinical Microbiology Procedures Handbook CD-ROM	Lynee S Garcia	American society for Microbiology press
10	Color Atlas of Medical Bacteriology, Second Edition	Luis de la Maza ¹ , Marie T. Pezzlo ² , Janet T. Shigei ³ , Grace L. Tan ⁴ , Ellena M. Peterson	American society for Microbiology press
11	Jawetz Melnick & Adelbergs Medical Microbiology	Jawetz, Melhick & Addbergs	McGraw-Hill Medical
12	Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases: 2-Volume Set,	John E. Bennett, Raphael Dolin, Martin J. Blaser	Saunders
13	Manual of Clinical Microbiology	James H. Jorgensen (Editor), Michael A. Pfaller (Editor)	American society for Microbiology Press

14	Topley and Wilson's Microbiology and Microbial Infections, 8 Volume Set	W. W. C. Topley, Sir Graham S. Wilson	Wiley-Blackwell
15	Molecular Microbiology: Diagnostic Principles and Practice	David H. Persing and Fred C. Tenover	American society for Microbiology Press
16	Vaccines	Stanley A. Plotkin, Walter Orenstein Paul A. Offit	Saunders
17	Clinical Immunology principle and practice	Robert R. Rich, Thomas A Fleisher et al	Saunders
18	Fields Virology Vol-1 & Vol-2	David M Knipe, Peter M Howley	Lippincott Williams and Wilkins

List of Journals:

Infection & Immunity.

- i. Bull WHO
- ii. Nature Medicine.
- iii. Am J Epidemiology.
- iv. J Infection Disease.
- v. J Virological Method.
- vi. J Clin Microbiology (Virology).
- vii. Antimicrobial Agents & Chemotherapy.
- viii. J. Immunology.
- ix. New England J Med.
- x. J Clin Microbiology.
- xi. JAMA.
- xii. American J Clin Pathol.
- xiii. Lancet.
- xiv. J Med Virology.