

**Ministry of Health
Kuwait Institute for Medical
Specialization**

Clinical Virology Training Program

Program Manual

Table of Contents

Welcome from the Program Director.....	5
Introduction.....	5
Goals of the Clinical Virology Training Program.....	6
General Objective of Clinical Virology Training Program.....	6
Program:	
Entry Requirements.....	8
Program Core components.....	8
I. Fundamental Skills.....	8
II. Good Medical Practice.....	9
III. Core Knowledge and Skills.....	10
• Basic Virology.....	10
• Clinical Virology.....	10
• Laboratory skills.....	11
• Infection Control.....	12
• Management.....	12
• Health and Safety.....	12
• Research and development.....	12
• Public Health and epidemiology.....	12
Program learning settings.....	13
Program description	
Year 1	
• Objective.....	14
• In-course Assessment of:.....	15
I. Laboratory Skills.....	15
Year 2	
• Objective.....	15
• In-course Assessment of:.....	15
i. Clinical Virology.....	15
Year 3	
• Objective.....	16
• In-course Assessment of:.....	16
i. Basic Virology.....	16
ii. Research.....	16
Year 4	
• Objective.....	16
• In-course Assessment of.....	16

i. Management.....	16
ii. Health and Safety.....	16
iii. Public Health and Epidemiology.....	16
Year 5	
• Objective.....	17
• In-course Assessment	17
Educational Activities	
I. Conferences and Tutorials.....	17
II. Written Assessments.....	18
On-call Duty.....	19
Evidence of Competence and Evaluations	
I. Objective.....	19
II. Workplace-based Assessment tools.....	20
Examination Regulation	
• Structure and Format of Examination.....	21
Board Exclusion Criteria.....	23
Leave policy	
• Rules and Regulations.....	23
Post Graduate Training Committee	
• Roles and Objectives.....	24
• List of Clinical Virology Board Members.....	26
Site Coordinator	
• Roles and Objectives.....	27
• List of Site Coordinators.....	27
CanMEDS Roles.....	28
Rotation Description and Objectives.....	29
Residents Rotations Schedule for 2013-2014.....	33

Welcome from the Program Director:

With the continuous discovery of new viruses and progress in the diagnosis and treatment of viral diseases, clinical virology is becoming a highly demanded medical specialty worldwide. The Clinical Virology Training Program of Kuwait Institute for Medical Specialization is one of few post graduate medical training programs that provide high quality training in clinical virology.

It is commonly thought that Clinical Virology specialists are confined only to working in laboratories. However, this is not entirely true. Even though, clinical virologists are based in laboratories, they are also responsible for diagnosing, treating and managing patients. Their duties range from patient clinical care to laboratory management and dealing with public health issues. In the Faculty of Clinical Virology, our aim is to graduate residents with sufficient clinical and laboratory skills to enable them practice at a consultant level and to be capable of running a modern virology unit.

Our curriculum is modified from that of the Royal College of Pathologists in London which is one of the most eminent Colleges for training in Clinical Virology worldwide. Our candidates have the opportunity to acquire the Kuwait Board certification and/or the Royal College of Pathologists' Fellowship.

One of the major strengths of our program is the availability of efficient facilities and staff that provide full support for the training process. In addition to the distinguished Clinical Virology Unit in Mubarak Al-Kabeer Hospital, we also count on the resources of a large and well-established research and education centre within the Faculty of Medicine. Since, the Clinical Virology Unit provides service to patients all around Kuwait, our residents also have a chance to visit other centers with different specialties in which admirable consultants provide comprehensive training and support.

Finally, an important feature of the Clinical Virology Training program is our residents, who love what they do and enjoy time with each other and the faculty. They are a thoughtful, energetic and fun group who continuously propel all of us to improve and who bring academic curiosity and excitement to our program.

Introduction

Currently there is a rapid increase in interest in clinical virology world-wide. This is mainly attributed to the new advances in diagnostic methods, increasing treatment options, discovery of new viruses, and outbreaks of viral infections.

The Kuwaiti board program for clinical virology aims to produce clinical virology specialists with sufficient competence to act as future consultants in this field.

The program is composed of five years of training with two examinations, the first after year two and the second after year five. This program is based on the standard curriculum issued by the Royal College of Pathologists. At the end of the training program, candidates will have the opportunity to sit both, the Kuwaiti board and the Royal College of Pathologists' Fellowship (FRCPath) examination.

Goals of the Clinical Virology Training Program

The purpose of this training program is to ensure that trainees attain sufficient knowledge and skill required to lead a full virology service at consultant level in the Ministry of Health or private sector in Kuwait and to acquire the FRCPATH certification.

The goal of the training program is to help the residents develop:

- Detailed understanding of basic virology and the pathogenesis of virus infections.
- Appreciation of the significance, and critical evaluation, of results generated in the laboratory
- Sufficient clinical experience to practice at the consultant level
- Basic management skills required to run a modern virology laboratory
- Awareness of all the major safety issues in a modern diagnostic laboratory
- Understanding of the relationship between individual laboratories and public health

General Objectives of Clinical Virology Training Program:

The clinical Virology training program is designed in a way to ensure that trainees have access to the necessary training opportunities to enable them to acquire the competencies and skills required to meet the objectives and goals.

1. Good clinical care
 - Specialists in Clinical Virology will be required to demonstrate adequate knowledge and skills in addition to appropriate behaviors in routine clinical work
 - They are expected to display broad understanding of
 - i. the diagnosis and management of infectious disease from a clinical and laboratory perspective
 - ii. diagnostic techniques required in the practice of clinical virology and where relevant microbiology
 - iii. knowledge of specialist areas in clinical virology; these include infection control, clinical microbiology and public health to provide a specialist opinion within areas of competency
 - iv. knowledge of the health protection aspects of clinical virology
2. Maintaining good medical practice
 - Specialists in Clinical Virology will take responsibility for and keep up to date their own relevant professional and self development and facilitate that of others

- Specialists in Clinical Virology will acknowledge that the level of their skills and expertise will advance as their careers progress and they specialize in certain areas of clinical practice
3. Teaching and training, appraising and assessing
 - Specialists will be able to demonstrate the potential to teach and train effectively at all levels of undergraduate and postgraduate education where required
 - Specialists will demonstrate skills and strategies in the process of feedback to colleagues and trainees, ensuring positive and constructive outcomes
 - Specialists will be capable of judging competence and professional attributes in others
 4. Relationships with patients
 - Specialists will be skilled in building relationships of trust with patients and their families, through effective interpersonal skills, a courteous and compassionate approach, and respect for their privacy, dignity and cultural and religious beliefs
 - Specialists will follow the principles and legal aspects of consent and confidentiality
 - Specialists will be able to manage difficult and complex situations with patients and their families, to advise them appropriately and to manage complaints effectively
 5. Working with colleagues
 - Specialists will strive to continue improving in all aspects of their work and that of colleagues while mindful of priorities and high standards
 - Specialists will have effective interpersonal skills which enable them to bring out the best in colleagues, to resolve conflicts when they arise and to develop working relationships within the team
 - Specialists will support teams that bring together different professions and disciplines and other agencies, to provide high quality healthcare
 - Specialists will develop an understanding of leadership possibly by drawing on values, strengths and abilities to deliver high standards of care
 6. Health
 - Specialists will act quickly and effectively if they have reason to believe that their own or a colleague's conduct, performance or health may put patients at risk

7. Probity
 - Specialists will always act in their personal and professional lives to maintain public trust in the profession
 - Specialists will undertake duties such as writing reports, giving evidence and completing and signing documents in a timely, honest and conscientious way
 - Specialists will, through their leadership, encourage the development and practice of these qualities in their colleagues
8. Good management skills
 - Specialists will acquire the management skills required in the running of the virology laboratory

Program:

○ Entry Requirements

- Candidates applying for admission into the program must have a recognizable medical qualification
- Candidates must have completed the internship year successfully before being accepted
- A satisfactory performance in the evaluating interview is also a mandatory requirement for potential residents
- Candidates applying for admission must have no debaring medical/psychological condition or criminal record

○ Program Core Components

At the end of the training period, the candidate should be able to demonstrate professional competence in the following components:

I. Fundamental Skills

Under consultant supervision, candidates should acquire sufficient knowledge of laboratory techniques to underpin clinical practice. Trainee should:

- Have gained a thorough understanding of laboratory health and safety practice
- Have gained experience in the safe handling of clinical samples in the laboratory
- Have gained a basic understanding of quality assurance in the diagnostic laboratory

- Have developed, under supervision, core reporting skills
- Have sufficient understanding of microbiology, mycology, and parasitology in addition to virology to offer basic advice on the interpretation of laboratory results
- Be able to manage common medical emergencies relevant to their clinical practice
- Understand the importance of infectious disease notifications
- Be aware of relevant national and international guidelines and where to find them
- Function as part of a multidisciplinary team
- Recognize critical incidents and start to understand how to manage them
- Understand the importance of clinical audit and risk management

II. Good medical practice

Under consultant supervision, candidates should take responsibility in self-development and keeping their knowledge up to date. They should demonstrate sufficient skill in their professional interaction with their colleagues and patients. Special attention should be paid to:

- Doctor–patient relationship: Informed consent, Confidentiality of the patients, breaking bad news, Educating patients (in terms of their disease, investigations required, therapy given and its side effects, prevention of complications and transmission)
- Patient safety
- Continuity of care: Satisfactory completion of tasks, appropriate documentation
- Working with clinical teams: Understand the roles and responsibilities of team members, communicate effectively and seek advice
- Interactions with other specialties: Recognize when input from another specialty is required, communicate effectively, and understand the roles of other clinical specialties and their limitations
- Self-development
 - Applying knowledge and evidence
 - Maintain an up to date knowledge of research evidence
 - Know how to access resources

- Awareness of relative national and international legislations, policies
 - Demonstrate the ability to utilize and criticize guidelines
- Relevance of outside bodies
 - Royal Colleges
 - Clinical Pathology Accreditation (UK), UK Accreditation Service (UKAS)
 - UK Clinical Virology Network
 - Centers for Disease Control and Prevention (CDC)
 - World Health Organization (WHO)
 - UK Department of Health (DH)
 - National Institute for Health and Clinical Excellence (NICE)
 - Healthcare Commission (HCC)
 - NHS Quality Improvement Scotland
 - National Patient Safety Agency (NPSA)
 - Health Protection Agency (HPA)
 - Veterinary Laboratories Agency

III. Core knowledge and skills

Under consultant supervision, candidates should develop sufficient knowledge and understanding of the following subjects:

- **Basic virology**

The candidate should develop satisfactory knowledge in

- Structure of viruses, the functions of virally-encoded proteins
- Genetics of viruses
- Taxonomy and classification of viruses
- Replication of viruses
- Immune response to infection
- Molecular biology
- Pathogenesis of virus infections

- **Clinical virology**

This component should provide the candidate with an in-depth knowledge of the etiology, clinical presentation, differential diagnosis and pathophysiology of disorders related to the specialty. In addition, the candidate should develop professional excellence in choosing and interpreting the diagnostic assays, using antivirals and applying prophylactic measures. The following skills/topics should be mastered:

- Patient medical history taking
- Examination of patients
- Differential diagnosis
- Investigations (including imaging)
- Treatment:
 - Classification of antimicrobial agents
 - Mechanism of action

- Drug dosages, route of administration and duration of treatment
 - Resistance (mechanisms, prevention, testing for)
 - Therapeutic drug monitoring
 - Drug development
 - Therapeutic use of immunoglobulins
- Follow up of patients
- Note-keeping and documentation
- Understanding the etiology and clinical presentation of infectious diseases
- Pathophysiology of the disease process
- Complications
- Clinical Governance
 - Clinical audit
 - Risk assessments
 - Research and development
 - Evidence-based practice

- **Laboratory skills**

The candidates should develop sufficient knowledge of the principles of assays used to investigate viral infections. They should be familiar with:

- Laboratory safety
- Containment levels
- Standard operating procedures (SOPs)
- Importance of audit and quality control
- Tests available, and the circumstances in which they are used
- Sample processing
- Identify common viral/microbial pathogens with confirmation of identity
- Distinction between significant and non-significant pathogens
- Sero-diagnosis in infectious diseases
- Molecular techniques
- Susceptibility testing
- Therapeutic drug monitoring
- Recognize advantages/disadvantages and strength/weaknesses of the techniques
- Be familiar with testing algorithms and selection of investigations
- Perform assays independently
- Knowledge of serological assays (theoretical and practical)
- Sensitivity, specificity, positive and negative predictive values, determination of uncertainty
- Cell culture
- Antigen detection
- Competence in interpretation and clinical authorization of laboratory results
- Correct interpretation of difficult test results

- Appropriately use laboratory resources when further investigations may be warranted
 - Quality assurance

- ***Infection control***

Candidates should be familiar with the epidemiology of the different virology related diseases. They should be able to provide professional advice related to infection control procedures in hospital and community settings. Candidates should have sufficient knowledge in the following subjects:

 - Pre- and post-exposure prophylaxis, both with antimicrobials and with immunoglobulins
 - Virus-specific and normal immunoglobulins
 - Vaccines (composition, indications and contra-indications, schedules, post-exposure prophylaxis, post-vaccination immunity checks, side effects)
 - Preventing nosocomial spread
 - Surveillance
 - Sterilization and disinfection
 - Emerging virus infections

- ***Management***

This component should provide the candidate with sufficient management skills required to run a modern virology laboratory. Candidates should be able to manage the budget and develop leadership skills. They should be familiar with the accreditation and quality management systems.

- ***Health and safety***

Candidates should obtain an in-depth understanding of health and safety issues in the laboratory and clinical settings. They should be aware of the safe practice, packaging and transportation of infectious agents, clinical waste management and in handling category 3 and 4 pathogens.

- ***Research and development***

Candidates should develop basic skills to carry out a laboratory based research project and to understand other people's research output.

- ***Public health and epidemiology***

The candidate should be aware of the epidemiology of viral diseases. He/she should also be familiar with the principles of the following

 - Prevalence of the disease
 - Community-acquired and nosocomial infections
 - Modes of transmission
 - Systems available for disease control

- Outbreak investigation
- Occupational health
- Prevention of infection (behavior modification, passive prevention, active prevention)
- Viral pathogens in food and water

○ Program Learning Settings

Clinical virology is a five years program. At the end of year two the candidates will have to pass Part I examination, and at the end of year five the candidates will have to sit the final examination. Candidates will be able to achieve the required clinical competence in this specialty through utilizing the following settings:

The main assignment centre – Virology unit/ Mubarak Al-Kabeer Hospital

This is the main training centre in which the candidates should fulfill the following objectives:

- Understanding of the basic principles of virus biology, the host immune response to infection and the pathogenesis of viral diseases
- Background preparation for future research
- In-depth knowledge and understanding of the laboratory aspects of medical virology
- To obtain an in-depth understanding of quality and accreditation issues
- To obtain an in-depth knowledge and understanding of the principles and practice of clinical virology:
 - Respiratory infections in the community, including mycoplasma, chlamydia/chlamydophila and coxiella burnetii
 - Infections (including toxoplasma gondii and pneumocystis jirovecii) in immunocompromised patients (solid organ transplant recipients bone marrow transplant recipients, HIV, congenital immunodeficiencies)
 - Prion disease including vCJD
 - Infections in pediatric patients including neonates
 - Foetal infections and infections in pregnant women (including toxoplasmosis)
 - Travel-related, non-uk endemic and epidemic viral infections [including arboviruses and viral haemorrhagic fever (VHF)]
 - Infections in adult and paediatric intensive care units (ICU) and special care baby unit (SCBU)
 - Viral infections of concern in specialized units e.g. Neurology, infectious diseases, gastroenterology/hepatology
 - Sexually transmitted infections (including HIV, treponemal infections and chlamydia trachomatis).
- To obtain an in-depth knowledge of role of antivirals and immunisation (active and passive) in the management and control of viral infections

- To obtain an in-depth knowledge on control of infection issues in both the hospital and community
- To obtain an in-depth knowledge on occupational health and infection
- To be able to advise on emerging infections
- To obtain sufficient microbiology knowledge of infections in general (e.g. Fungal, parasitic and bacterial) to enable consideration of these in differential diagnosis
- To understand laboratory management and how it is applied in the ministry of health
- To obtain an in-depth understanding of health and safety issues both locally and nationally in order to practice safely in a laboratory and in a clinical or other setting and to advise on safe practice
- To obtain an understanding of risk assessment for dealing with category 3 and 4 pathogens and be familiar with the requirements for handling of such pathogens.
- To equip the trainee with the basic skills necessary to undertake a laboratory-based research project
- To be able to describe and discuss the effects of viral infections on a population
- To be able to use, interpret and evaluate surveillance data
- To describe the steps in the investigation of outbreaks
- Candidates are expected to keep the appropriate documentation and refer to their supervisors for support

Weekly visits to Infectious Diseases Hospital, Organ Transplant Centre, Husain Makki Jumaa Centre and Dermatology clinics

- Candidate should participate in the grand rounds in the Infectious Diseases Hospital, Organ Transplant Centre and Hussain Makki Jumaa Centre in addition to dermatology clinics. These grand rounds and clinics are excellent opportunity to provide clinical consultations (under consultant supervision) with the aid of a multi-disciplinary medical team. For additional information, please refer to the goals and objectives of the individual discipline.

○ Program Description

The development of professional excellence and the acquisition of clinical knowledge is a continuous process throughout the training years. However, in every year, special attention could be paid to certain objectives.

Year 1

Objective:

Candidates will be introduced to

- **Basic Virology** including virus structure, classification, replication, modes of transmission, virus-host cell interactions, host responses to virus infection, pathogenesis, antiviral drugs, virus vaccines and prions
- **Clinical Virology** including case- based learning, laboratory techniques (basic methods, confirmatory assays, advantages/disadvantages of the techniques, testing algorithms). They will also be exposed to the principles and utilities of each of the

laboratory assays in use. Candidates will be required to investigate, follow, and manage patients (under consultant supervision) in both the medical wards and the Intensive Care Unit (ICU) of Mubarak Al-Kabeer Hospital. In the laboratory they will be introduced to health and safety issues within the laboratory

During this year, candidates will spend **three months** in the Microbiology to gain some experience in non- virology related infectious diseases.

In-course Assessment of:

Laboratory skills

- A critical review of an assay used within the laboratory
- An audit of an assay covering the laboratory aspects
- An audit of the clinical utility of an assay

Year 2

Objective:

Candidates will

- Accumulate additional experience in **clinical virology** and **patient management**.
- Be exposed to **infection control** issues such as disinfection, sterilization and infection transmission prevention procedures.
- Expected to be able to provide an appropriate differential diagnosis for the common presentations of infectious diseases, and be able to follow and utilize the different guidelines in the management of patients.

During this year, candidates will also have to spend **three additional months** in the Microbiology Unit in addition to **one month** in the Parasitology and Mycology sections, Department of Microbiology, Faculty of Medicine. This is important in order to strengthen their differential diagnosis and be able to detect non- viral infectious diseases.

In-course Assessment of:

Clinical virology

- Four case reports (different areas) in which the candidate was involved including literature review and written as for publication
- A critical review of an outbreak in which the candidate was involved
- A report on an infection control meeting attended by the candidate
- A logbook covering the patients managed and followed by the candidate

At the end of this year, candidates will have to pass the part I of the Clinical Virology board examination.

Year 3

Objective:

Candidates will

- Accumulate additional experience in **clinical virology** and **patient management**.
- Build additional knowledge in the different **laboratory assays** in use with regards to their sensitivity, specificity and limitations.
- Be introduced to management and quality assurance in the laboratory
- Be required to attend the **laboratory management** and **health and safety** meetings
- Be provided with an opportunity to participate in a research project.

In-course Assessment of:

- I. Basic virology
 - Review article covering a topic related to basic virology
- II. Research
 - Paper accepted for publication or a report of a project

Year 4

Objective:

Candidates will

- Accumulate additional competence in clinical virology and laboratory skills.
- Undertake more advanced training in **laboratory management** and **infection control** in hospital and community settings.
- Familiar with the different **public health** procedures such as outbreak investigations, surveillance and disease prophylaxis

During this year, candidates will have to spend **two months** in the Infectious Diseases Hospital. They should consult with specialists in the Department of Community Medicine, Faculty of Medicine, on topics of surveillance and its importance in prediction, management, and prevention of infectious diseases.

In-course Assessments:

- I. Management
 - Written annual business plan for the laboratory or written business case for the introduction of a new service/diagnostic assay by the laboratory.
- II. Health and safety
 - Summary of the issues discussed and managed in the health and safety committee
 - Risk assessment of virological or non- virological method
- III. Public health and epidemiology
 - Phylogenetic analysis of sequence data and clinical application or a report of epidemiological data generated by the laboratory

Year 5

Objective:

Candidates will

- Achieve clinical excellence and sufficient competence in all the core components of the training program that will allow the candidate to function as a consultant virologist upon completion of the program. Therefore, candidates must demonstrate professional excellence in:
 - Basic virology science
 - Investigating, managing and following up patients
 - Performance and interpretation of laboratory assays
 - Troubleshooting in the laboratory
 - Infection control and prevention
 - Laboratory management including budget management, quality assurance and introduction of a new test
 - Health and safety procedures in the laboratory and clinical settings
 - Undertaking a clinical research
 - Outbreak investigations, surveillance and other public health procedures

During this year, candidates are advised to spend **two months** in a reputable virology unit in the UK.

In-course Assessments:

- All written assessments need to be accepted before the candidates are allowed to sit the final examination.

At the end of this year, candidates will have to pass the part II examination of the Clinical Virology board examination.

○ Educational Activities

I. Conferences and tutorials

Including:

Journal club

Critical appraisal of papers and evidence based approach to patient care.

Core curriculum tutorials

These cover amongst others the basic virology, clinical virology and infection control basic skills.

Participating in committees

Health and safety committee- The candidate should play a role in improving health and safety measures, arranging health and safety presentations, and conducting a risk assessment.

Management committee- The candidate should play a role in quality control, budget management and laboratory organization.

Infection control committee- the candidate should actively participate in planning and execution of infection control measures for an outbreak.

II. Written assignments

Each candidate will have to write a number of in-course assignments similar to those required by the Royal College of Pathologists. These written projects will cover the different core components of the training program. They are as follows:

Basic virology

- Review article covering a topic related to basic virology
Format as per Reviews in Medical Virology composed of up to 3000 words (in addition to a summary of up to 250 words) with up to 5 illustrations/tables and up to 30 references

Laboratory skills

- A critical review of an assay used within the laboratory
Composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 5 references
- An audit of an assay covering the laboratory aspects
Composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 5 references
- An audit of the clinical utility of an assay
Composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 5 references

Clinical virology

- Four case reports (different areas) of patients followed up by the candidate and including a literature review
Each composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 15 references
- A critical review of an outbreak in which the candidate was involved
composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 15 references
- A report on an infection control meeting attended by the candidate.
Candidate should write a summary of the issues raised (not more than one A4 side)
- A logbook covering the patients managed and followed by the candidate. All advice given when practicing and any relevant outcomes should be recorded and kept in the logbook. Trainees should record what they have learnt

Management

- Written annual business plan for the laboratory or written business case for the introduction of a new service/diagnostic assay by the laboratory
composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 15 references

Health and safety

- Summary of the issues discussed and managed in the health and safety committee after attending the committee for at least one year (not more than one A4 side)
- Risk assessment of a virological method Composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 5 references

Research

- Paper accepted for publication or a report of a project

Public health and epidemiology

- Phylogenetic analysis of sequence data and clinical application or a report of epidemiological data generated by the laboratory composed of up to 1000 words (in addition to a summary of up to 250 words) with up to 2 illustrations/tables and up to 5 references

○ **On-call Duty**

A maximum of two residents, preferably at different years of the program, are teamed up together as first on-call. The first on-call team is supervised by a senior registrar or a consultant as their second on-call. A minimum of 10 days per month of on-call duty is expected from each resident.

There are no on-call duty exemptions during the residency program. However, if the resident produces appropriate medical paper, this can be evaluated by the Post Graduate Training Committee.

○ **Evidence of competence and evaluation**

Objectives:

- Promote excellence in the practice of Clinical Virology and to be responsible for maintaining standards through training, assessments, examinations and professional development.
- Indicate suitability of choice at an early stage of the chosen career path.
- Help to identify trainees who should change direction or leave the specialty.
- Indicate the capability and potential of a trainee through tests of applied knowledge and skill relevant to the specialty.
- Demonstrate readiness to progress to the next stage(s) of training having met the required standard of the previous stage.
- Provide feedback to the trainee about progress and learning needs.
- Support trainees to progress at their own pace by measuring a trainee's capacity to achieve competencies for their chosen career path.
- Enhance engagement in medical leadership.
- Assure the public that the trainee is ready for unsupervised professional practice.

Workplace-based Assessment Tools:

- Case-based discussion (CBD) (minimum of 6 satisfactory outcomes required per year)
 - A way for trainees to present and discuss their cases with more experienced colleagues throughout their training and obtain systematic and structured feedback from the assessor.
 - Designed to assess decision-making and the application or use of medical knowledge in relation to the care of patients where the trainee has been involved either clinically or through their laboratory involvement.
 - Enables the discussion of the ethical and legal framework of practice.

- Directly observed practical skills (DOPS) (minimum of 6 satisfactory outcomes)
 - Used for assessing competence in the practical procedures that trainees undertake.
 - The observation takes place whilst the trainee undertakes the activity.
 - The procedure being observed should last no more than 10–15 minutes before the assessment takes place.
 - The assessor will then spend 5-10 minutes providing immediate feedback and completing the assessment form with the trainee present.

- Annual evaluation
 - A process whereby trainees are rated on their performance by people who are familiar with their work
 - The assessors will review trainees' progress in the training program and document the competences and skills that are being gained.

- Rotation evaluation
 - A process whereby trainees are rated on their performance during their rotations by people who are familiar with their work at the rotation site

○ **Examination Regulations**

The major assessments will occur at the end of year 2 of training in the form of Part 1 examination and at the end of year 5 of training in the form of Part 2 examination.

- Structure and format of examination:
 - Part 1 (year 2) examination consists of:
 - 100 multiple-choice questions (MCQ) and 50 extended matching format questions (EMQ) Three-hour examination designed to test both knowledge and understanding.

 - Assessed virology examination portfolio:

Successful completion of the module assignments will be an integral part of the Part 2 examination in Clinical Virology.

 - The curriculum contains six core modules, which have written assignments as part of the assessment.
 - These module assignments will form the core examination portfolio.

- These module assignments are distributed through year 1 to year 4.
 - Each assignment will be prepared by the trainee under the guidance of their educational supervisor or trainer for that module.
 - The educational supervisor and module trainers will have an active role in the continuous assessment of the assignments.
 - When an assignment is complete, it will be formally assessed by an external member of the Virology Examining Panel, who will award the work a grade of 'satisfactory' or 'not satisfactory'.
 - Trainees should be encouraged to start their virology examination portfolios as soon as entering the board
 - Trainees should submit their in-course assessments to the Post Graduate Training Committee on yearly basis as specified
- Part 2 (year 5) examination consists of:
- Written examination
 - Clinical
 - OSPE
 - Viva
- The written, clinical and viva components of the Part 2 examination will be held together. Candidates must attempt all components in the same session. The written, practical and clinical components will carry equal weight and candidates will be required to pass all three components in the same session in order to pass the Part 2 Examination.
- The formal written/clinical/viva examination will take place over three days.**
- Format of the written examination
- The written component will consist of two parts, each of 90 minutes.
 - The first part will consist of two compulsory essay questions, one on a general clinical topic and the second on service delivery and management.
 - The marking for each question in the first part will be based on model answers.
 - The second part of the written examination will consist of ten short-answers questions from which the candidate will answer nine.
 - The marking for each question in the second part will be based on model answers.
 - Questions in the written papers will map across the curriculum.
- Format of the clinical examination:
- Long and short case scenarios
 - OSPE-style stations with result interpretation and clinical scenarios will make up an important component of the clinical examination.
- The final oral assessment (structured viva) will be retained as part of clinical examination to ensure candidates' clinical competence.

○ **Board Exclusion Criteria**

Exclusion criteria of candidates who fail to satisfy the board requirements:

- Each candidate will be allowed to repeat a total of three years during their five year training
- They should complete all their prescribed modules by the end of year 4 (R4) and therefore, will not be allowed to progress to year 5 (R5) unless they have completed their entire set of modules
- Candidates may repeat R2 if they fail part I examination, R5 if they fail part II examination or R4 if they fail to complete the required modules
- Candidates who cannot complete the program in 8 years will be expelled from the program
- Candidates may also be excluded from the training program if there was evidence of serious misconduct.

○ **Leave Policy**

- Rules and Regulations
 - Annual vacation leave:
 - 4 weeks of vacation leave is allowed annually
 - The leave should be approved by the program director
 - The leave should be no more than one week per month
 - Study leave:
 - A total of 2 weeks is allowed during the Clinical Virology residency program.
 - This period can be divided between part I and part II or taken all at once.
 - Scenario 1: One week for part I exam and one week for part II exam
 - Scenario 2: Two weeks for part I exam
 - Scenario 3: Two weeks for part II exam
 - Sick leave:
 - 15 days is allowed annually
 - If sick leaves exceeded 15 days, the condition needs to be evaluated individually by a committee assigned by KIMS.
 - Maternity leave:
 - Two maternity leaves (30 days per leave) are allowed during the five year residency program
 - Residents are not allowed to take more than 60 days per year including the maternity and vacation leave.
 - Residents have the right to take this leave as consecutive or divided period:
 - Scenario 1: Maternity leave 30 days only once and no annual leave
or

- Scenario 2: Maternity leave 30 days only once and one week/month annual leave or
- Scenario 3: Maternity leave only 15 days at once and 15 days only once and no annual leave or
- Scenario 4: Maternity leave of 15 days only once and 15 days only once and one week/month annual leave

- Incidental leave:
 - Are not allowed during the residency program, unless there are exceptional circumstances.

- Leave of absence:
 - Should not exceed one year
 - If it does exceed one year, the request should be assessed by a committee formed by the secretary general of KIMS.
 - Upon return from the leave of absence, the resident continues his/her residency from the last position when it was left.
 - The resident may only take the leave of absence from October to September. It must start at the beginning of the academic year and end at the end of the academic year (October-September).

- Haj leave:
 - Each resident is allowed to take one Haj leave per residency program of 30 days.
 - Residents are not allowed to take more than 60 days per year including the Haj and other leaves.

- Conference leave:
 - Each resident is allowed one week conference leave per academic year approved by program director.
 - This leave is intended for conferences being attended in Kuwait.

- The total number of missed days during training will be assessed by a committee from KIMS (Assessment Training Committee) for eligibility to sit the final board examination

Clinical Virology Board:

- **Roles and Objectives:**
 - The board members **must** meet regularly, at least quarterly, and keep minutes that reflect the activity of the board.
 - The Clinical Virology Board members **must** communicate regularly with each other, the department or division of Clinical Virology, and residents.

- The program **must** provide opportunities for residents to attain all competencies as outlined in the objectives of training.
- Post Graduate Training Subcommittee:
 - The Post Graduate Training Committee or a subcommittee **must** select candidates for admission to the program.
 - The Post Graduate Training Committee or a subcommittee **must** be responsible for the assessment of residents and for the promotion of residents in the program in accordance with policies determined by KIMS.
 - The Post Graduate Training Committee **must** maintain an appeal mechanism consistent with KIMS policies. The Post Graduate Training Committee and/or a subcommittee thereof should receive and review appeals from residents and, where appropriate, refer the matter to KIMS.
 - The Post Graduate Training Committee **must** undertake an ongoing review of the program to evaluate the quality of the educational experience and to review the resources available.
- There **must** be a site coordinator or supervisor, responsible to the Program Director, at each site participating in the program, including electives. There **must** be active liaison between the Program Director and the site coordinators.
- There **must** be an identified board member to oversee involvement of residents in research and other scholarly work, aided by a sufficient number of board members with the responsibility to facilitate and supervise this involvement.
- There **must** be an environment of inquiry and scholarship in the program.
- There **must** be a satisfactory level of research and scholarly activity maintained among the faculty identified with the program, as evidenced by:
 - Peer-reviewed research funding;
 - Publication of original research in peer-reviewed journals and/or publication of review articles or textbook chapters;
 - Involvement by faculty and residents in current research projects;
 - Recognized innovation in medical education, clinical care or medical administration.
- Program Director Roles:
 - The Program Director is responsible for the overall conduct of the integrated residency program.
 - The Program Director **must** be assured of sufficient time and support to supervise and administer the program.
 - The Program Director is responsible to the head of the department concerned and to the Faculty Chairman.
 - The Program Director, assisted by the Post Graduate Training Committee and/or program subcommittees **must** plan, organize, and supervise the program.

- **Clinical Virology Board Committee:**

- Faculty Chairman
- Program Director
- Program Director Assistance
- Board Members

- **List of Clinical Virology Board Members**

- Board Chairman:**

- **Dr. Widad Al-Nakib, FRCPath, FIDSA**
Professor and Head of Clinical Virology Unit,
Dept. of Microbiology,
Faculty of Medicine, Kuwait University

- Program Director:**

- **Dr. Mamoun Al-Qaseer, FRCPath.**
Assistant Head of Clinical Virology Unit,
Department of Laboratories,
Mubarak Al-Kabeer Hospital

- Board Director Assistant:**

- **Mrs. Dina A.Khalik, BSc**
Laboratory Manager of Virology Unit,
Dept. Of Microbiology,
Faculty of Medicine, Kuwait University

- Board Members:**

- **Dr. Haya Al-Tawalah, FRCPath.**
Senior Registrar Clinical Virology,
Clinical Virology Unit,
Department of Laboratories,
Mubarak Al-Kabeer Hospital
- **Dr. Osama Albaqsami, FRCPC**
Consultant Infectious Disease
Infectious Disease Hospital
- **Dr. Salem Al-Shamari, FRCPC**
Consultant
Kuwait Cancer Centre

- **Dr. Nampori, FRCPC**
Consultant Nephrologist
Organ Transplant Centre
- **Dr. Khalifa Al-Banwan, FRCPath.**
Consultant Microbiologist
Head of Amiri Hospital Microbiology Unit
- **Dr. Wassim chehadeh, MSc, PhD.**
Associate professor
Clinical Virology Unit
Faculty of Medicine, Kuwait University

Site Coordinator

- **Roles and Objectives:**
 - Supervise residents during their rotation at a specific site and are responsible to the Program Director.
 - Maintaining close communication with the Program Director
 - Encourage residents to manage and follow up patients, under his/her supervision.
 - Provide skills training, reflective exercises, seminars and directed reading in the site area of specialty for residents.
- List of Site Coordinator:
 - **Mubarak I-Kabeer Hospital:**
 - **Dr. Mamoun Al-Qasser, FRCPath.**
Assistant Head of Clinical Virology Unit,
Department of Laboratories,
Mubarak Al-Kabeer Hospital
 - **Infectious Disease Hospital:**
 - **Dr. Osama Albaqsami, FRCPC**
Consultant Infectious Disease
Infectious Disease Hospital
 - **Kuwait Cancer Centre (Hussain Maki Joma Centre)**
 - **Dr. Salem Al-Shamari, FRCPC**
Consultant

Kuwait Cancer Centre

- **Organ Transplant Centre**
 - **Dr. Nampori, FRCPC**
Consultant Nephrologist
Organ Transplant Centre

- **Microbiology Department, Amiri Hospital**
 - **Dr. Khalifa Al-Banwan, FRCPath.**
Consultant Microbiologist
Head of Amiri Hospital Microbiology Unit

CanMedS Oriented Roles of the Training Program

General Objectives

A. Medical Expert:

Residents should be able to:

- Function effectively as a consultant to provide optimal, ethical and patient-centered medical care.
- Develop and maintain clinical knowledge, skills and attitudes relevant to the practice of Clinical Virology, as outlined in the specific objectives listed below.
- Perform a complete and appropriate assessment of a patient (including both history and physical examination that are relevant to the patient's particular problem(s) or infectious disease).
- Demonstrate sufficient knowledge of the principles of assays used to investigate viral infections
- Recognize advantages/disadvantages and strength/weaknesses of the diagnostic techniques and the significance of the results obtained.
- Use preventive and therapeutic interventions effectively.
- Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic.
- Demonstrate knowledge of non-viral causes of syndromes that mimic viral infections.
- Demonstrate knowledge of the principles and practice of infection prevention and control in facilities and the community.

- Demonstrate knowledge of viral characteristics, and pathogenesis and clinical features of the diseases produced.
- Demonstrate sufficient management skills required to run a modern virology laboratory.

B. Communicator:

Residents should be able to:

- Provide clear and thorough explanations of diagnosis, investigation and treatment to healthcare professionals, patients and family members in both written and verbal form, as appropriate.
- Elicit and synthesize relevant information and perspectives of patients and families, colleagues and other professionals.
- Develop a common understanding on issues, problems and plans with laboratory personnel, patients and families, colleagues and other professionals, in both written and verbal forms, to develop a shared plan of care.

C. Collaborator:

Residents should be able to:

- Participate effectively and appropriately in an inter-professional healthcare team and recognize and acknowledge the respective roles and expertise of others.
- Effectively work with other health professionals to prevent, negotiate, and resolve inter-professional conflict.
- Demonstrate knowledge of the roles and functions of Clinical Virology specialists in the Infection Prevention.
- Demonstrate knowledge of the roles and functions of Clinical Virology specialists with respect to public health.
- Describe the roles and expertise of all members of the interdisciplinary team in the virology laboratory.

D. Manager:

Residents should be able to:

- Participate in activities that contribute to the effectiveness of their healthcare organizations and systems, including Infection Prevention and Control, Health and Safety, and Outbreak Control Committees.
- Set realistic priorities and use their time effectively.
- Allocate finite healthcare resources appropriately.
- Serve in administration and leadership roles, as appropriate.

E. Health Advocate:

Residents should be able to:

- Demonstrate the principles and practice of laboratory biosafety.
- Select and prioritise virology tests for individual patients and patient groups.
- Respond to individual patient health needs and issues as part of patient care, including accession of limited or rare resources.
- Respond to the health needs of the communities that they serve.
- Recognize and describe the impact of individual antiviral decisions on the hospital.
- Describe the determinants of health of the populations that they serve.
- Promote the health of individual patients, communities and populations including an understanding of immunization practices on individual and population-based health.

F. Scholar:

Residents should be able to:

- Demonstrate the ability to conduct independent or collaborative research in Clinical Virology, when appropriate.
- Demonstrate the abilities for self-directed learning
- Maintain and enhance professional activities through ongoing learning.
- Critically evaluate information and its sources, and apply this appropriately to practice decisions.
- Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others, as appropriate.
- Contribute to the creation, dissemination, application and translation of new medical knowledge and practices in Clinical Virology, as appropriate.

G. Professional:

Residents should be able to:

- Discuss the significance and implications of reporting notifiable, communicable diseases.
- Recognize their limitations and call on others for their help and expertise.
- Demonstrate integrity and trustworthiness with all laboratory personnel, laboratory physicians and other healthcare providers.
- Demonstrate integrity, honesty, compassion and respect for diversity.
- Fulfill medical, legal and professional obligations as a Clinical Virology specialist.
- Demonstrate a commitment to their patients, profession and society through ethical practice, by a process of self-reflection and self-regulated learning.
- Demonstrate a commitment to their patients, profession, and society through participation in profession-led regulation.
- Demonstrate a commitment to physician health and sustainable practice.
- Demonstrate knowledge and understanding of the professional, legal and ethical codes to which Clinical Virology specialist are bound including confidentiality issues, appropriate conduct when interacting with industry and conducting research.

Specific Objectives

Candidates should develop sufficient knowledge and understanding of the following subjects

Basic virology

Residents should develop satisfactory knowledge in

- Structure of viruses, the functions of virally-encoded proteins
- Genetics of viruses
- Taxonomy and classification of viruses
- Replication of viruses
- Immune response to infection
- Molecular biology
- Pathogenesis of virus infections

Clinical virology

Residents should develop in-depth knowledge of the etiology, clinical presentation, differential diagnosis and pathophysiology of disorders related to the specialty. In addition, residents should develop professional excellence in choosing and interpreting the diagnostic assays, using antivirals and applying prophylactic measures. The following skills/topics should be mastered:

- Patient medical history taking
- Examination of patients
- Differential diagnosis
- Investigations (including imaging)
- Treatment:
 - Classification of antimicrobial agents
 - Mechanism of action
 - Drug dosages, route of administration and duration of treatment
 - Resistance (mechanisms, prevention, testing for)
 - Therapeutic drug monitoring
 - Drug development
 - Therapeutic use of immunoglobulins
- Follow up of patients
- Note-keeping and documentation
- Understanding the etiology and clinical presentation of infectious diseases
- Pathophysiology of the disease process
- Complications
- Clinical Governance

- Clinical audit
- Risk assessments
- Research and development
- Evidence-based practice

Laboratory skills

Residents should develop sufficient knowledge of the principles of assays used to investigate viral infections. They should be familiar with:

- Laboratory safety
- Containment levels
- Standard operating procedures (SOPs)
- Importance of audit and quality control
- Tests available, and the circumstances in which they are used
- Sample processing
- Identify common viral/microbial pathogens with confirmation of identity
- Distinction between significant and non-significant pathogens
- Serodiagnosis in infectious diseases
- Molecular techniques
- Susceptibility testing
- Therapeutic drug monitoring
- Recognize advantages/disadvantages and strength/weaknesses of the techniques
- Be familiar with testing algorithms and selection of investigations
- Perform assays independently
- Knowledge of serological assays (theoretical and practical)
- Sensitivity, specificity, positive and negative predictive values, determination of uncertainty
- Cell culture
- Antigen detection
- Competence in interpretation and clinical authorisation of laboratory results
- Correct interpretation of difficult test results
- Appropriately use laboratory resources when further investigations may be warranted
- Quality assurance

Infection control

Residents should be familiar with the epidemiology of the different virology related diseases. They should be able to provide professional advice related to infection control procedures in

hospital and community settings. Residents should have sufficient knowledge in the following subjects:

- Pre- and post-exposure prophylaxis, both with antimicrobials and with immunoglobulins
- Virus-specific and normal immunoglobulins
- Vaccines (composition, indications and contra-indications, schedules, post-exposure prophylaxis, post-vaccination immunity checks, side effects)
- Preventing nosocomial spread
- Surveillance
- Sterilisation and disinfection
- Emerging virus infections

Management

Residents should develop sufficient management skills required to run a modern virology laboratory. Residents should be able to manage the budget and develop leadership skills. They should be familiar with the accreditation and quality management systems.

Health and safety

Residents should obtain in-depth understanding of health and safety issues in the laboratory and clinical settings. They should be aware of the safe practice, packaging and transportation of infectious agents, clinical waste management and in handling category 3 and 4 pathogens.

Research and development

Residents should develop basic skills to carry out a laboratory based research project and to understand other people's research output.

Public health and epidemiology

Residents should be aware of the epidemiology of viral diseases. He/she should also be familiar with the principles of the following

- Prevalence of the disease
- Community-acquired and nosocomial infections
- Modes of transmission
- Systems available for disease control
- Outbreak investigation
- Occupational health
- Prevention of infection (behavior modification, passive prevention, active prevention)
- Viral pathogens in food and water.

Rotation Description and Objectives

For additional information please refer to goals and objectives of individual rotations.

Infectious Diseases Hospital

- Candidate will participate in ward rounds, patient's care and follow up.
- There will be a good exposure to patients with infectious diseases, in particular with blood-borne viral infections (hepatitis B and C, HIV), influenza, travel associated diseases (e.g., rabies, dengue, infections with rash, etc.)
- Candidate is expected to work with the infectious diseases specialist to provide patient care

Organ Transplant Centre and Husain Makki Jumaa Centre

- Candidate will participate in ward rounds, patient's care and follow-up
- There will be a good opportunity to manage immuno-compromised patients with infectious diseases
- Candidate has to know cytomegalovirus, BK virus, Epstein-Barr virus, herpes simplex virus, human herpes virus 6, and adenovirus infections/reactivations in association with immunosuppression
- The candidate will be supported by the organ transplant specialists

Public Health Virology Laboratory/ Department of Community Medicine

- Spending time in these centers will equip the candidate with the required knowledge and skills in public health medicine
- It will provide an opportunity to understand the principles and practices of surveillance of infectious diseases, outbreak investigation, general principles involved in immunization programs, as well as occupational health (hepatitis B and C, HIV, influenza, varicella-zoster, herpes) and travel health procedures (tropical virology)
- Candidate will have the opportunity to be exposed to additional laboratory diagnostic assays in the Public Health Laboratory

Microbiology unit/ Amiri Hospital

- Candidate will participate in ward rounds and following up patients with a positive bacteriological culture
- Under consultant supervision, the candidate will be exposed to the bacteriology associated infectious diseases, patient management and antibacterial treatment and its follow-up
- Candidate should be familiar with the laboratory reporting and monitoring trends (e.g. in antimicrobial resistance), data handling and interpretation
- This is essential to expose the candidate to non-viral associated infectious diseases

Parasitology and Mycology sections/ Microbiology unit/ Faculty of Medicine-

- Under consultant supervision, candidates will manage and follow-up patients referred to these sections
- Candidate should know and understand imported and endemic parasitic infections, their epidemiology, and use of anti-parasitic drugs

- Candidates should know superficial and deep (systemic) infections caused by yeasts and moulds including diagnostic, therapeutic and preventive strategies
- This is essential to complete the required basic knowledge in non-viral associated infectious diseases