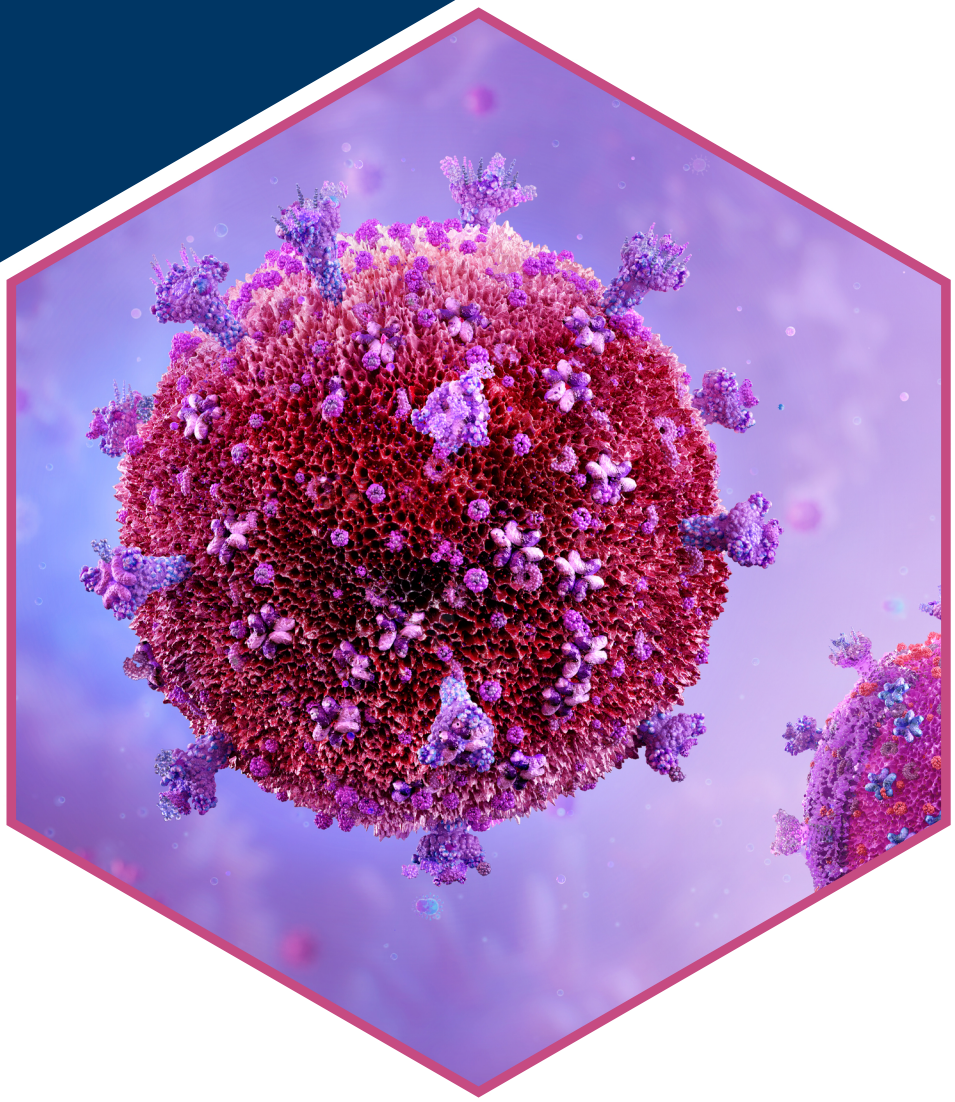
VIROLOGY DIGITAL SPECIALIST PORTFOLIO MODULES

IBMS Institute of Biomedical Science



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Virology Digital Specialist Portfolio Modules

- Quality (please see separate booklet for learning outcomes)
- General Principles of Assay Selection in Virology Diagnostics
- Respiratory Infections
- Enteric Viral Infections
- Sexually Transmitted Infections
- Infections in Pregnancy (Pre- and Post-Delivery) and Newborns
- Infection of the central nervous system (meningitis/encephalitis)
- Rashes and Systemic Infections including Vesicular and Red Rashes
- Bloodborne Viruses
- Investigations of Viral Hepatitis
- Immunocompromised Patients
- Travel Related ad Imported Infections
- Vaccination
- Antiviral Treatment and Resistance
- Molecular techniques in infectious science
- Infection prevention and control
- Emerging infections and the role of national agencies

Please note
All learning outcomes (LOs) are met through two pieces of evidence, Q&A as agreed with a training officer and an additional piece of work as selected by the candidate.

A statement of work and reflective statement on each module will be required which will include sign off by the trainer stating that the candidate works in accordance with laboratory procedures, the competence for which should be evidenced in-house and is not part of the portfolio submission.

Indicative Content outlines background knowledge that may be required to meet the LOs and/or knowledge and competences expected to be demonstrated across multiple modules. Knowledge of areas highlighted in the indicative content may be examined during the viva.

Module Title	General Principles of Assay Selection in Virology Diagnostics
Module code	TBC
Rationale/ Aims	This module seeks to elucidate the critical role of assay selection in virology diagnostics. It aims to empower learners with the knowledge required to discern and apply suitable assays for the detection, identification, and characterization of viral infections. Understanding assay selection principles is crucial for accurate diagnosis, treatment, and disease management. Candidates will gain an understanding of the foundational principles governing the selection of assays in diagnosis of infectious disease. Candidates will gain the expertise necessary for optimal assay selection in diverse virology diagnostic scenarios.
Learning outcomes	1. Discuss the development of modern diagnostic assays with reference to the underpinning theory. 2. Discuss the assay principles and performance (sensitivity, specificity, positive and negative predictive values) of the following: Chemiluminescent Immunoassay Enzyme linked Immuno-sorbent Assay (ELISA)- direct, indirect, competitive, sandwich 3. Explain the principles and the laboratory application of the following: Agglutination assays Line Blot Avidity Testing 4. Identify factors which influence test selection. 5. Explain the difference between verification and validation and explain how these are applied in practice. 6. Demonstrate with an example candidates contribution towards verification or validation. 7. Discuss the advantages of serological testing in practice and the challenges associated with interpretation.
Indicative Content	Candidates require knowledge and understanding of: Theoretical measures of assay performance and the influence of specimen quality on the ability of the assay to deliver meaningful results. Overview of virology assays: PCR, ELISA, Immunofluorescence, Next-Generation Sequencing, etc. Principles underlying assay selection: turnaround time, cost-effectiveness. Factors influencing assay choice: Viral load, sample type & timing in disease course, epidemiological considerations. Optimal assay selection in different virology diagnostic contexts. Quality assurance processes Practical considerations and challenges in virology assay selection.

	Participants should have a foundational understanding of diagnostic virology, including various assay types, neurological diseases, systemic and blood-borne viruses, as well as infection control measures. The potential benefits of syndromic testing

Module Title	Respiratory Infections
Module code	TBC
Rationale/ Aims	This module will detail the range of viral infections that result in respiratory disease including acute and chronic infections. This will outline risk factors for infection, mechanisms of causing respiratory disease, diagnostic approaches and management of cases. Candidates will gain knowledge of a range of viral causes of respiratory disease and explain the management and diagnostic pathways. They will be able to summarise the mechanisms by which host damage occurs and risk factors for infection. They will be able to evaluate the strengths and limitations of different diagnostic methods and when confirmatory tests or use of reference facilities are required.
Learning outcomes	1. Describe clinical respiratory syndromes associated with viral infections with examples of causative agents including seasonal, emerging and travel-related pathogens. 2. Describe clinical respiratory syndromes associated with non-viral infections with examples of causative agents (e.g. *Mycoplasma pneumoniae, Pneumocystis jirovecii, Bordetella pertussis*). 3. Discuss patient groups at high risk of adverse outcomes as a result of viral respiratory infections e.g. age, immunosuppression, co-infections. 4. Describe the pathogenesis of 5 viruses which cause acute or chronic respiratory disease in humans, including Influenza, Respiratory Syncytial Virus (RSV) and SARS-CoV-2. 5. Discuss the selection of appropriate laboratory investigations of respiratory viral infection, as applicable to candidates laboratory. 6. Discuss with examples respiratory viral confirmatory tests and when reference facilities are required. 7. Discuss surveillance of respiratory viruses including mutational changes to monitor: Diagnostic assurance of respiratory assays Emergence of new pathogens Influenza antigenic shift and drift for vaccination effectiveness. 8. Demonstrate with examples from practice, analysis of a nucleic acid amplification test or a sequencing test for respiratory viral infection. 9. Discuss, with an example, a viral respiratory pathogen causing an outbreak, epidemic or a pandemic and the role of the virology laboratory. 10. Discuss examples of therapeutic options for respiratory infection e.g. vaccinations, antivirals, monoclonal antibodies.
Indicative Content	Candidates require knowledge and understanding of: Transmission of respiratory viruses Diagnosis of enteric viruses Sample requirements used in investigations

	Management of respiratory viruses Importance of public health, including reporting National and international surveillance for control and prevention of respiratory pathogens Quality assurance processes

Module Title	Enteric Viral Infections
Module code	Allocated on Brightspace
Rationale/ Aims	This module covers a range of viral infections that result in enteric disease as well as non-viral causes of enteric disease and enteric viruses that do not cause gastroenteritis. This will outline risk factors for infection, mechanisms of causing enteric disease, diagnostic approaches and management of cases. Candidates will gain knowledge of a range of viral causes of enteric disease and explain the management and diagnostic pathways. Candidates will understand the mechanisms by which host damage occurs and risk factors for infection. They will be able use diagnostic methods and understand when confirmatory tests or use of reference facilities are required.
Learning outcomes	1. Describe clinical enteric syndromes associated with viral infections with examples of causative agents including seasonal and travel-related pathogens. 2. Discuss important non-viral causes of enteric infections. 3. Discuss patient groups at high risk of adverse outcomes as a result of viral enteric infections e.g. age, immunosuppression. 4. Describe the pathogenesis of 3 viruses which cause enteric disease in humans. 5. Demonstrate selection and application of laboratory investigations of enteric viral infection, as applicable to candidates laboratory. 6. Discuss viral infections transmitted through the enteric route that do not give rise to gastroenteritis, e.g. polio. 7. Discuss with examples enteric viral confirmatory tests and when reference facilities are required. 8. Discuss surveillance of enteric viruses to monitor: Outbreak investigations Vaccine efficacy Polio virus 9. Discuss the role of the laboratory within the management of patients with enteric viruses in primary and secondary care settings.
Indicative Content	Candidates require knowledge and understanding of: Transmission of enteric viruses Diagnosis of enteric viruses Sample requirements for investigations Management of enteric viruses Importance of public health, including reporting National and international surveillance for control and eradication of enteric pathogens Quality assurance processes

Module Title	Sexually Transmitted Infections
Module code	8914
Rationale/ Aims	This module explores the laboratories role in the diagnosis of sexually transmitted infection. Candidates will gain knowledge and understanding of the sample types and the techniques utilised for diagnosis of infection. Candidates will understand the role of treatment and control.
Learning outcomes	1. Identify 3 sexually transmitted infections and discuss their pathogenesis 2. Discuss, with an example, the potential influence that one infection may have on another consider for example, risk factors where relevant. 3. Discuss the importance of sample selection, collection and the impact that the presence of interfering substances has on methodology / assays used. 4. Discuss different diagnostic assays and methodologies that can be used in the investigation of sexually transmitted infections and demonstrate with an example from practice situations where further testing is required. 5. Discuss, with examples, where and why specific tests are selected in different settings, such as, sexual health clinics, point of care and laboratories, consider time samples are taken and circumstances. 6. Discuss the impact sample types and timings has on methodology/assay selection and performance, and discuss the extent to which specificity and sensitivity is considered. 7. Discuss the infection control and public health strategies of STIs in populations through contact tracing, screening, vaccination and prophylaxis. 8. Describe, with examples, different types of therapeutic options that may be available in the treatment of STIs including antivirals, antimicrobials, immunoglobulin and vaccines. 9. Describe medico-legal requirements of laboratories investigating samples that require a chain of evidence and discuss when this is applicable.
Indicative Content	Candidates require knowledge and understanding of: Organisms which contribute to sexual disease. The use of different assays to identify and monitor sexually transmitted diseases, in respect to treatment. Candidates should be aware of: Relevant guidelines pertinent to sexually transmitted diseases: British Association for Sexual Health and HIV British HIV Association

Module Title	Infections in Pregnancy (Pre- and Post-Delivery) and Newborns
Module code	TBC
Rationale/ Aims	This module aims to provide a comprehensive understanding of infections occurring during pregnancy, both pre- and post-delivery. Knowledge in this area is pivotal for professionals engaged in obstetrics, gynaecology, neonatology, and infectious disease management. Candidates will gain knowledge on a variety of infectious agents, their impact on maternal and foetal health, diagnostic challenges, and management strategies. Candidates will gain proficiency in managing infections during pregnancy, enriching their skill set as healthcare practitioners.
Learning outcomes	1.Describe the following organisms which cause adverse outcomes in pregnancy and newborns, identify the periods within gestation with the most risk associated, and the clinical outcomes of infection for both mother and newborn as relevant: Viruses: Cytomegalovirus Rubella Herpes Simplex virus Human Immunodeficiency virus Parvovirus B19 Varicella Zoster virus Measles Other: Group B Streptococcus *Toxoplasma gondii* Syphillis (*Treponema pallidum*) 2.Discuss requirements for sample collection from patients with potential virus infections in pregnancy and newborns, include procedures involved and optimal sample times. 3.Discuss techniques used in the detection of viruses, viral antigens and viral antibodies for infection in pregnancy and newborns for both common and less-common causes and describe 3 methodologies from candidates practice. 4.Discuss the importance of timing when applying diagnostic testing for the detection and management of infections in pregnancy. 5.Discuss effective testing strategies for the prevention, and control of infections in obstetric and neonatal settings. 6.Discuss treatment of those viruses listed in LO1 in the management of patients during pregnancy and in the newborn.

	7.Discuss infection control measures implemented as a result of laboratory testing which safeguard maternal and neonatal health. 8.Demonstrate identification of a result from candidates practice requiring clinical action and explain the rationale for actions taken. 9.Identify travel related viral infections of relevance to pregnancy and neonates including tests sent to referral laboratories or other specialist laboratories.
Indicative Content	Candidates require knowledge and understanding: Overview of infections in pregnancy: Viral (e.g., CMV, Zika, rubella, parvo virus B19), bacterial (e.g., Group B Streptococcus), fungal, and parasitic infections. Maternal-foetal transmission mechanisms and impact on neonatal outcomes. Clinical presentation, diagnosis, and management of infections during and after pregnancy. Antenatal screening programs and preventive measures. Challenges in treating infections pre- and post-delivery. Infection control protocols and strategies for obstetric and neonatal care units. Quality assurance processes Candidates should have a basic understanding of obstetrics, gynaecology, neonatology, and infectious diseases.

Module Title	Infection of the Central Nervous System (meningitis/encephalitis)
Module code	8930
Rationale/ Aims	This module explores the laboratories role in the diagnosis of meningitis and/or encephalitis through the analysis of cerebral spinal fluid and other relevant sample types. Candidates will gain understanding of the importance of cell counts and how microscopy results can be used alongside biochemical markers in the diagnosis of meningitis. Candidates will gain knowledge of the causes of meningitis and encephalitis and be able to demonstrate the methodology used to determine the causative organism.
Learning outcomes	1. Explain the significance of microscopy including counting, stains and/or differentiating white and red cells in a CSF with reference to normal ranges, and discuss non-infective reasons why white cells may be raised in a CSF. 2. Discuss how biochemical markers can aid in the diagnosis of meningitis/encephalitis. 3. Discuss with 3-5 examples from practice the pathogenesis of meningitis/encephalitis and discuss how patient factors, such as underlying conditions (e.g. HIV, PMH, hydrocephalus) and age, influence potential infectious agents. 4. Demonstrate with an example from practice the ability to analyse a CSF (or other relevant sample), in order to identify infectious agents (Include an understanding of the limitations of the method/technique chosen in the diagnosis of central nervous system infection). 5. Discuss merits of different diagnostic approaches including multiplex molecular panels and give examples of when confirmatory tests or reference facilities are required or mandated. 6. Demonstrate safe handling of CSF samples with reference to potentially high-risk patients (e.g. Creutzfeldt-Jakob disease [CJD], tuberculosis [TB]). 7. Demonstrate reporting of CSF samples and discuss the importance of a rapid turnaround time. 8. Discuss with examples treatment strategies and management of patients with acute and chronic meningitis/ encephalitis.
Indicative Content	Candidates require knowledge and understanding of: Anatomy of the brain and spinal cord with reference to meningitis/encephalitis. Need for urgency in providing a quick and accurate result. Basic principles behind microscopes and how to use them correctly. CSF shunts, their uses and infectious agents associated with them

Module Title	Rashes and Systemic Infections including Vesicular and Red Rashes
Module code	Allocated on Brightspace
Rationale/ Aims	This module aims to provide a comprehensive understanding of rashes, both infectious and non-infectious aetiologies. The module will equip candidates with specialised knowledge of viral rash infections including diagnosis and management strategies, impact of results in high-risk patients and infection control considerations for patients within different settings. Candidates will gain an in-depth understanding of rash infections including viral, bacterial, fungal, parasitic and non-infectious aetiologies Candidates will comprehend the impact of viral rash infections in high-risk patient groups and recognise varying presentation of rashes and different laboratory techniques used for the diagnosis of viral rash infections. Candidates will gain knowledge of preventive measures, treatment modalities, and management strategies for viral rash infections and gain understanding of infection, prevention and control strategies for viral rash infections used within hospital and community settings.
Learning outcomes	1. Identify important viral causes of rash infections (e.g. varicella zoster virus, measles, parvovirus, mpox, enterovirus, rubella, human herpes virus 6). 2. Discuss important non-viral causes of rash infections (e.g. bacterial, fungal, drug-induced, immune-mediated). 3. Summarise the pathogenesis of viral infections causing rashes including acute and systemic infection. 4. Describe the varied morphological presentation of rashes (i.e. vesicular, maculopapular, purpuric, petechial) on a wide range of skin colours. 5. Identify individuals at high risk of viral rash infections (i.e. pregnant individuals, immunocompromised, neonates) and recognise the urgency associated with results from high-risk individuals. 6. Discuss the range of specimen types, with consideration of their applicability to the time course of infection, (e.g. vesicle fluid, acute and convalescent sera, nose and throat swabs, faeces (e.g. enterovirus), blood). 7. Demonstrate conducting, evaluating and reporting results from diagnostic tests to investigate viral rash infection in accordance with standard laboratory procedures. 8. Summarise the management of viral rash infections including available vaccines, antivirals and immunoglobulin therapy. 9. Describe strategies for the management of viral rashes in the laboratory including high-consequence infectious disease infections.

	10. Discuss the national surveillance of viral rash infections and notification to the relevant public health body including the requirement for referral to reference laboratories.
Indicative Content	Candidate should have knowledge and understanding of: A range of viral, non-viral and non-infectious causes of rashes. Viral causes which impact antenatal care, immunocompromised care and neonatal care. Investigative methods, including effective use of serological and molecular assays to investigate rash infections, understanding the impact on infection control, seroconversion and prophylaxis and treatment for managing patients. Principles of procedures performed including quality management and troubleshooting Potential risks and risk assessment of procedures associated with biological specimens including high risk patients. Use referral laboratories to support diagnosis and national surveillance Candidates should be aware of containment laboratories for high-risk viral pathogens

Module Title	Bloodborne Viruses
Module code	TBC
Rationale/ Aims	The module will overview bloodborne viral infections, and those appropriate methods to allow successful diagnosis and control of these infections. This module is core to those working in diagnostic virology, but also those working in specialist sexual health clinics, and is essential for those wanting to develop as a practitioner in virology. Candidates will gain awareness of optimal sample types and when/how these should be collected. They will cover the range of diagnostic methods relevant to these infections, together with insights into the strengths and limitations of each approach. Candidates will gain understanding in assays for screening and confirmatory tests, alongside those used in monitoring viral load. Candidates will gain an understanding of the role of treatment and control from use of pre and post exposure prophylaxis, and available treatments.
Learning outcomes	1.Discuss the following with focus on viral structure, replication, pathogenesis, route of infection, risk of transmission and co-infections: Human Immunodeficiency virus (HIV) Hepatitis B virus (HBV) Hepatitis C virus (HCV) Human T-Lymphotropic virus (HTLV) 2.Discuss sample types and sample timing within infection course and how this will influence assay choice and performance. 3.Identify and explain the precautionary measures required during sample handling, transport and testing for samples known or suspected to be positive for bloodborne viruses. 4.Discuss recommended methodologies for bloodborne virus diagnosis, monitoring and resistance testing, referring to relevant policies/guidelines as appropriate. 5.Demonstrate application of the diagnostic assays used for initial investigation/diagnosis and monitoring of bloodborne viral infections in your practice. 6.Discuss the quality assurance processes used in the acceptance of quantitative PCR assays and include examples from your practice where relevant. 7.Discuss the implications of a positive test result for public health, including required actions. 8. Discuss current treatment options, including antivirals, for those organisms listed in LO1. 9. Describe the use of pre-exposure and post-exposure prophylaxis strategies for HIV and hepatitis B, using examples of laboratory testing algorithms to manage infection risk in donors and recipients.

Indicative Content	Candidates require knowledge and understanding of: The use of serological and molecular testing procedures for screening, diagnosis, confirmation and monitoring of bloodborne viruses. Quantification of viral load samples, reporting against an international standard Quality assurance processes

Module Title	Investigation of Viral Hepatitis
Module code	TBC
Rationale/ Aims	This module aims to provide a comprehensive understanding of the investigative procedures, diagnostic methodologies, and management strategies relevant to viral hepatitis. Covering a range of viral agents causing hepatitis, including hepatitis A, B, C, D, and E, this module intends to equip candidates with the knowledge and skills necessary for effective diagnosis and management of viral hepatitis infections. Candidates will gain a comprehensive understanding of the various types of viral hepatitis, including their virology, epidemiology, and clinical manifestations. Candidates will gain knowledge of specific investigative methods and laboratory tests used for the diagnosis and monitoring of viral hepatitis infections. Candidates will understand investigative strategies for different stages and types of viral hepatitis infections and understand the principles of managing viral hepatitis cases based on investigative findings and patient-specific factors. Candidate will be able to interpret diagnostic results and understand their clinical significance in the context of viral hepatitis.
Learning outcomes	1. Differentiate between known types of viral hepatitis and their respective diagnostic criteria. 2. Identify risk factors for acquisition of viral hepatitis. 3. Demonstrate investigative methods and laboratory tests for the diagnosis and monitoring of viral hepatitis infections and discuss their application. 4. Demonstrate interpretation of investigative results and correlate them with clinical presentation and infectious risk in viral hepatitis cases. 5. Discuss investigative strategies applied based on the type and stage of viral hepatitis infections. 6. Discuss how viral hepatitis investigative findings and patient-specific factors influence patient management. 7. Discuss the use of serological analysis in management of hepatitis B including: needlestick injuries, antenatal screening, exposure prone procedures (EPP), acute or chronic infection and vaccination response. 8. Discuss the role of POCT testing in high-risk population such as prisons.
Indicative Content	Candidates require knowledge and understanding of Viral hepatitis: A, B, C, D, and E viruses. Diagnostic tests and investigative procedures for viral hepatitis: serology, nucleic acid testing, liver function tests, imaging studies. Interpretation of investigative results and correlation with clinical manifestations. Investigative approaches for acute vs. chronic hepatitis.

	Challenges and limitations in viral hepatitis investigations. Quality assurance processes

Module Title	Immunocompromised patients
Module code	TBC
Rationale/ Aims	This module will detail viral and non-viral diseases that are characteristically found in association with immunodeficiency, It will highlight the increased risk of infection in this group, the infection control issues and measures which may be taken in relation to these infections. Candidates will gain insights into the range of diagnostic options and the suitability of these to infections and their control including treatment options and prophylaxis.
Learning outcomes	1. Describe the causes of primary and secondary immunodeficiency including viral, hereditary, physiological and drug induced. 2.Identify and differentiate various infections that pose a risk to immunocompromised patients. 3.Discuss how different infectious agents may be associated with specific immune defects of the patient. 4. Discuss the application of diagnostic assays that can be used in immunocompromised patients for diagnosis and screening. 5. Discuss how sample types and timings influence assay performance. 6. Discuss when there might be a need for confirmatory testing for immunocompromised patients and the role of the reference laboratories. 7. Discuss the treatment and prophylaxis of infection in this patient group including antivirals, immunoglobulin and vaccines. 8. Discuss with examples how immunocompromised patients with infection are managed.
Indicative Content	Candidates must have knowledge and understanding of: Pathogenesis of immunodeficiency Diagnostic and confirmatory testing Quality assurance processes for all tasks performed

Module Title	Travel Related and Imported Infections
Module code	TBC
Rationale/ Aims	This module will provide an understanding of the range of viral infections not indigenous to the UK. This includes zoonotic viruses from groups such as arboviruses; filoviruses, hantaviruses, rhabdoviridae and enteroviruses. Candidates will gain knowledge of exotic viral infections, their risk factors and how patient history can aid investigation. They will also gain understanding of the management of highly pathogenic infectious diseases.
Learning outcomes	1.Identify at least 6 examples of exotic viral infections and their particular risk factors. 2. Explain the natural ecological cycles for two selected infections with different transmission modes, including geographical locations and risks for transmission to humans. 3. Describe the clinical and patient history factors suggestive of exotic infection. 4. Compare appropriate diagnostics when exotic viral infection is suspected, including when services of reference laboratories might be required. 5. Identify which samples to collect and discuss necessary precautions to comply with health and safety legislative requirements. 6. Compare control measures to limit risks globally and locally if a case is diagnosed. 7. Discuss with examples management of highly pathogenic infectious viruses such as Lassa fever virus.
Indicative Content	Candidates require knowledge and understanding of: Infection control in respect to high containment infectious diseases within the laboratory and clinical settings Quality assurance processes performed/required Utility of post-exposure prophylaxis, for example, cases with high risk of rabies exposure Candidates should maintain an awareness of new incursions of imported viral infections

Module Title	Vaccination
Module code	8913
Rationale/ Aims	This module aims to equip candidates with a comprehensive understanding of the foundational principles governing the history of vaccination, and its evolution to the current range of vaccine strategies. Candidates will gain understanding in vaccine preventable illness and the challenges to provide individual and herd immunity and why these different approaches are important in infectious disease.
Learning outcomes	1. Compare passive and active immunity and demonstrate how these are applicable to your practice. 2. Explain the mechanism of the following: Inactivated vaccines Live-attenuated vaccines 3. Explain the mechanism of the following vaccine types with an example of each; subunit, recombinant, polysaccharide, mRNA, viral vector vaccines and conjugate vaccines. 4. Discuss the strategies of vaccination to protect individuals with consideration to age, travel and immune status. 5. Discuss the strategies of vaccination to protect populations. 6. Discuss the strategies of vaccination in the eradication of disease. 7. Evaluate reasons for vaccine hesitancy and the impact of low vaccine uptake in populations. 8. Describe, with an example, the pro's and cons of vaccination versus testing and isolation. 9. Discuss, with an example from candidates practice, the importance of referral to reference laboratories, and explain the role of the Health Protection Team in vaccine preventable diseases.
Indicative Content	Candidates require knowledge and understanding of: Principles of immunity Principles of vaccination Different types of vaccines Description of vaccination for herd immunity Description of vaccination for individual protection Vaccinations for different groups, e.g. healthcare workers

Module Title	Antiviral Treatment and Resistance
Module code	TBC
Rationale/ Aims	This module aims to provide a working knowledge and understanding of antiviral treatment and resistance. Candidates will gain knowledge of common families of antiviral agents and the mechanisms of resistance that can occur, when antiviral agents should be used, understanding how antiviral resistance can be detected and strategies to prevent resistance.
Learning outcomes	1.Describe the mode of action of antiviral drugs with at least 4 examples of antivirals selected from the following categories and identify which pathogen they are targeted at: Direct virus-targeting antiviral drugs include attachment inhibitors Entry inhibitors Uncoating inhibitors Protease inhibitors Polymerase inhibitors Nucleoside and nucleotide reverse transcriptase inhibitors Nonnucleoside reverse-transcriptase inhibitors Integrase inhibitors 2. Describe the use of neutralising antibodies in the treatment of viral infections giving at least one example. 3. Describe the use of antiviral treatment for acute viral infection giving two examples. 4. Describe the use of antiviral treatment for chronic viral infection giving two examples. 5. Describe the use of antiviral treatment for viral infection in immunosuppressed patients giving two examples. 6. Explain antiviral resistance and identify 3 common viruses where antiviral resistance can be present. 7. Describe phenotypic and genotypic methods for detecting antiviral resistance and discuss their application in practice. 8. Describe the use of combinatorial antiviral strategies to mitigate resistance giving one example. 9. Demonstrate interpretation of resistance testing results, used to detect antiviral resistance mutations and guide treatment decisions.
Indicative Content	Candidates require knowledge and understanding of: Principles of antiviral treatment Principles of antiviral resistance

	Antivirals used in acute viral infections Antivirals used in chronic viral infections Antivirals used in viral infections in the immunosuppressed Healthcare practices and routine microbiology. Quality assurance processes

Module Title	Molecular Techniques in Infection Science
Module code	8916
Rationale/ Aims	This module aims to equip candidates with a comprehensive understanding of the foundational principles governing the selection of molecular techniques in diagnosis of infectious disease. Candidates will gain an understanding of various molecular techniques used in pathogen diagnostics, they will develop proficiency in assessing the strengths, limitations, and specific applications of different molecular techniques. Candidates will gain a comprehensive understanding of the skills necessary to select appropriate molecular techniques based on pathogen characteristics, sample types, sample timing and diagnostic objectives. Candidates will be able to demonstrate the ability to critically analyse diagnostic scenarios and make informed decisions regarding technique selection and apply knowledge gained to enhance diagnostic accuracy and contribute to effective patient care.
Learning outcomes	1.Discuss, with examples, the importance of specimen requirements including sample timing and issues that could affect assay performance. 2.Discuss the principles of nucleic acid extraction including: Phenol chloroform Solid phase spin column Magnetic bead 3.Discuss the principles and clinical application of the following molecular techniques: Nucleic acid amplification tests including PCR and isothermal amplification techniques Sequencing techniques (Next Generation/Whole Genome/ Sanger) 4.Evaluate with examples the strengths, limitations and application of three molecular assays (different techniques where possible) to candidates practice. 5.Discuss with examples situations when molecular techniques are selected to enhance diagnostic accuracy and patient care. 6.Discuss appropriate molecular assays required in the investigation of a diagnostic scenario from candidates practice, such as fever of unknown origin, consider diagnosis, treatment, and infection control. 7. Discuss the possible root causes, corrective actions and preventative actions of the following common molecular errors: Positive result for the negative amplification control Positive result in the extraction control Negative result in the positive amplification control Failed internal amplification result Positive results for environmental controls

Indicative Content	Candidates require knowledge and understanding of: The theoretical measures of molecular assay performance and the influence of specimen quality on the ability of the assay to deliver meaningful results. Overview of molecular assays: PCR, NASBA, bDNA, Isothermal amplification, Next-Generation Sequencing, etc. Principles underlying molecular assay selection: Sensitivity, specificity, turnaround time, diagnostic platform, cost-effectiveness. Factors influencing molecular assay choice as relevant to practice, e.g. Viral load, sample type & timing in disease course, epidemiological considerations. Optimal molecular assay selection in different pathogenic diagnostic contexts. Practical considerations and challenges in pathogen molecular assay selection.

Module Title	Infection Prevention and Control (IPC)
Module code	8915
Rationale/ Aims	This module explores the laboratories role in the prevention and control of infections within the hospital and within community settings. Candidates will gain an understanding of infection prevention and control techniques and the knowledge to support outbreak investigations.
Learning outcomes	1. Discuss the role of the laboratory in supporting the infection prevention and control team in performing patient screening and maintaining a safe environment for patients. 2. Summarise the common pathogens that cause healthcare associated infection of IPC concern. 3. Discuss, with an example from practice, the environmental monitoring that is recommended for augmented, theatre and intensive care areas or other areas as applicable to candidates practice. 4. Explain and evaluate with examples from practice the variety of techniques used to perform standard or enhanced surveillance (e.g. media choice, use of molecular technology, sequencing). 5. Discuss with examples from practice the role of national agencies in the monitoring and resolution of outbreaks caused by bacteria, viruses and fungi. 6. Demonstrate, with examples from practice, compliance with the statutory requirements of the laboratory to notify health protection agencies. 7. Explain the structure and function of the local and regional infection prevention and control teams including within hospital and community locations and discuss how the laboratory supports their national remit to monitor key pathogens.
Indicative Content	Candidates require knowledge and understanding of: The monitoring role of, and reports produced by, national agencies. The role of national agencies and local health protection in resolving outbreaks. The role of the laboratory in supporting local health protection and national agencies. Appropriate personal protective equipment (PPE) and behaviours within laboratory and healthcare settings. Recommended environmental monitoring for a variety of areas, e.g. high dependency, haematology-oncology, other specialist units.

Module Title	Emerging Infections and the Role of National Agencies
Module code	8921
Rationale/ Aims	This module explores the relationship between diagnostic laboratories, health protection teams, reference laboratory networks and national health security agencies. Candidates will gain an understanding of how monitoring for new and emergent diseases is managed with an understanding of surveillance at local, regional, national and global levels and multi-agency response.
Learning outcomes	1. Describe, with a recent example, the emergence of a new infectious human pathogen linked to a large outbreak. 2. Discuss with an example from practice, diseases that have been demonstrated to, or have the potential, to pass from animals to humans. 3. Describe a bioterrorism incident and agents with the potential to be used as deliberate release biological agents. 4. Demonstrate compliance with the Health Protection Notification Regulations (2010) with an example from practice of a causative agent notification. 5. Discuss the surveillance remit of diagnostic laboratories. 6. Discuss with an example from practice the role a relevant reference service in the confirmation and surveillance of a pathogen requiring a causative agent notification. 7. Describe how global health patterns and emerging infections influence diagnostic testing strategies. 8. Describe with an example a neglected tropical disease.
Indicative Content	Candidates require knowledge and understanding of: Impact of the following on disease: Climatic and geopolitical change Natural disasters Migration and movement of people

About this version

Document title: IBMS Virology Digital Specialist Portfolio Modules

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Version: Version 1

Date active: August 2024

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