



**FACULTY OF
PATHOLOGY**

ROYAL COLLEGE OF
PHYSICIANS OF IRELAND

HIGHER SPECIALIST TRAINING IN

MICROBIOLOGY (CLINICAL AND LABORATORY)



This curriculum of training in Clinical Microbiology was developed in 2010 and undergoes an annual review by Dr Maeve Doyle, National Specialty Director, Dr Ann O'Shaughnessy, Head of Education, and by the Microbiology (Clinical and Laboratory) Training Committee. The curriculum is approved by the Faculty of Pathology.

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Introduction

Clinical Microbiology is a clinical specialty which focuses on the study of human diseases caused by microorganisms including bacteria, viruses, fungi and parasites. It includes the study of microbial pathogenesis and epidemiology and is related to the study of disease pathology and immunology. It is a speciality which encompasses both the laboratory diagnostic aspects and prevention and clinical management of microbial diseases.

The Clinical Microbiology curriculum has been designed to provide trainees with a comprehensive training in medical microbiology, medical virology, infection prevention and control and infectious diseases.

Besides these specialty specific elements, trainees in Clinical Microbiology must also acquire certain core competencies which are essential for good medical practice. These comprise the generic components of the curriculum.

Aims

Upon satisfactory completion of specialist training in Clinical Microbiology, the doctor will be **competent** to undertake comprehensive medical practice in that specialty in a **professional** manner, unsupervised and independently and/or within a team, in keeping with the needs of the healthcare system.

Competencies, at a level consistent with practice in the specialty of Clinical Microbiology, will include the following:

- Patient care that is appropriate, effective and compassionate dealing with health problems and health promotion.
- Medical knowledge in the basic biomedical, behavioural and clinical sciences, medical ethics and medical jurisprudence and application of such knowledge in patient care.
- Interpersonal and communication skills that ensure effective information exchange with individual patients and their families and teamwork with other health professionals, the scientific community and the public.
- Appraisal and utilisation of new scientific knowledge to update and continuously improve clinical practice.
- The ability to function as a supervisor, trainer and teacher in relation to colleagues, medical students and other health professionals.
- Capability to be a scholar, contributing to development and research in the field of Clinical Microbiology.
- Professionalism.
- Knowledge of public health and health policy issues: awareness and responsiveness in the larger context of the health care system, including e.g. the organisation of health care, partnership with health care providers and managers, the practice of cost-effective health care, health economics and resource allocations.
- Ability to understand health care and identify and carry out system-based improvement of care.

Professionalism

Being a good doctor is more than technical competence. It involves values – putting patients first, safeguarding their interests, being honest, communicating with care and personal attention, and being committed to lifelong learning and continuous improvement. Developing and maintaining values are important; however, it is only through putting values into action that doctors demonstrate the continuing trustworthiness with the public legitimately expect. According to the Medical Council, Good Professional Practice involves the following aspects:

- Effective communication
- Respect for autonomy and shared decision-making
- Maintaining confidentiality
- Honesty, openness and transparency (especially around mistakes, near-misses and errors)
- Raising concerns about patient safety
- Maintaining competence and assuring quality of medical practice

Entry Requirements

Applicants for Higher Specialist Training (HST) in Clinical Microbiology must have completed Basic Specialist Training in General Internal Medicine and obtained the MRCPI.

Applicants without BST in General Internal Medicine and MRCPI must provide evidence of equivalency. BST and Membership examinations in other clinical disciplines will be considered, for example:

- Anaesthetics
- Emergency Medicine
- General Practice
- Paediatrics
- Obstetrics & Gynaecology
- Surgery

Applicants should be able to demonstrate their interest in and a commitment to the specialty.

Entry on the training programme is at Year 1. Deferrals are not allowed on entry to HST.

Duration & Organisation of Training

The duration of HST in Clinical Microbiology is 5 years, one year of which **may** be gained from a period of full-time research.

In the normal course of events, the Part I FRCPATH will be taken after a minimum of twelve months training in Microbiology. The Part II FRCPATH is taken after a minimum of three years of recognised training. However, this exam is under review and trainees are strongly urged to contact the RCPATH in London for up-to-date advice.

Adequate experience in virology is required as part of the HST programme in Clinical Microbiology, however, this may be addressed as part of assignments to hospitals in which the General Clinical Microbiology service includes a substantial element of virology.

Trainees should note that it is not possible to consider personal circumstances in determining allocations of training.

Essential Training: Trainees must attend study days as advised by the National Speciality Director.

Minimum Procedures:

While no particular order or sequence of training will be imposed and programmes offered should be flexible i.e. capable of being adjusted to meet trainees' needs, trainees must spend the first 2 years of training in clinical posts in Ireland before undertaking any period of research or any out of clinical programme experience (OCPE). The earlier years will usually be directed towards acquiring a broad general experience of Clinical Microbiology under appropriate supervision.

An increase in the content of hands-on experience follows naturally and, as confidence is gained and abilities are acquired, the trainee will be encouraged to assume a greater degree of responsibility and independence.

If an intended career path would require a trainee to develop further an interest in a sub-specialty within Clinical Microbiology, this should be accommodated as far as possible within the training period, re-adjusting timetables and postings accordingly.

Generic knowledge, skills and attitudes support competencies which are common to good medical practice in the all the Medical and related specialties. It is intended that all Specialist Registrars should re-affirm those competencies during HST. No time-scale of acquisition is offered, but failure to make progress towards meeting these important objectives **at an early stage** would cause concern about a SpR's suitability and ability to become independently capable as a specialist.

Training Programme

The training programme offered will provide opportunities to fulfil all the requirements of the curriculum of training for Clinical Microbiology in approved training hospitals. Each post within the programme will have a named trainer/educational supervisor and programmes will be under the direction of the National Specialty Director for Clinical Microbiology. Programmes will be as flexible as possible consistent with curricular requirements, for example to allow the trainee to develop a sub-specialty interest.

The experience gained through rotation around different departments is recognised as an essential part of HST. A Specialist Registrar may not remain in the same unit for longer than 2 years of clinical training; or with the same trainer for more than 1 year.

Where an essential element of the curriculum is missing from a programme, access to it should be arranged, by day release for example, or if necessary by secondment.

Assessment Process

The methods used to assess progress through training must be valid and reliable. The Curriculum has been re-written, describing the levels of competence which can be recognised. The assessment grade will be awarded on the basis of direct observation in the workplace by consultant supervisors. Time should be set aside for appraisal following the assessment e.g. of clinical presentations, case management, observation of procedures. As progress is being made, the lower levels of competence will be replaced progressively by those that are higher. Where the grade for an item is judged to be deficient for the stage of training, the assessment should be supported by a detailed note which can later be referred to at the Annual Evaluation Meeting. The assessment of training may utilise the Mini-CEX, DOPS and Case Based Discussions (CBD) methods adapted for the purpose. These methods of assessment have been made available by HST for use at the discretion of the NSD and nominated trainer. They are offered as a means of providing the trainee with attested evidence of achievement in certain areas of the Curriculum e.g. competence in procedural skills, or in generic components. Assessment will also be supported by the trainee's portfolio of achievements and performance at relevant meetings, presentations, audit, in tests of knowledge, attendance at courses and educational events.

Generic Components

This chapter covers the generic components which are relevant to HST trainees of all specialties but with varying degrees of relevance and appropriateness, depending on the specialty.

As such, this chapter needs to be viewed as an appropriate guide of the level of knowledge and skills required from all HST trainees with differing application levels in practice.

Good Professional Practice

Objective: Trainees must appreciate that medical professionalism is a core element of being a good doctor and that good medical practice is based on a relationship of trust between the profession and society, in which doctors are expected to meet the highest standards of professional practice and behaviour.

Medical Council Domains of Good Professional Practice: Relating to Patients, Communication and Interpersonal Skills, Professionalism, Patient Safety and Quality of Patient Care.

KNOWLEDGE

Effective Communication

- How to listen to patients and colleagues
- The principles of open disclosure
- Knowledge and understanding of valid consent
- Teamwork
- Continuity of care

Ethics

- Respect for autonomy and shared decision making
- How to enable patients to make their own decisions about their health care
- How to place the patient at the centre of care
- How to protect and properly use sensitive and private patient information in accordance with data protection legislation and how to maintain confidentiality
- The judicious sharing of information with other healthcare professionals where necessary for care following Medical Council Guidelines
- Maintaining competence and assuring quality of medical practice
- How to work within ethical and legal guideline when providing clinical care, carrying research and dealing with end of life issues

Honesty, openness and transparency (mistakes and near misses)

- Preventing and managing near misses and adverse events.
- When and how to report a near miss or adverse event
- Incident reporting; root cause and system analysis
- Understanding and learning from errors
- Understanding and managing clinical risk
- Managing complaints
- Following open disclosure practices
- Knowledge of national policy and National Guidelines on Open Disclosure

Raising concerns about patient safety

- Safe working practice, role of procedures and protocols in optimal practice
- The importance of standardising practice through the use of checklists, and being vigilant
- Safe healthcare systems and provision of a safe working environment
- Awareness of the multiple factors involved in failures
- Knowledge and understanding of Reason's Swiss cheese model
- Understanding how and why systems break down and why errors are made
- Health care errors and system failures
- Human and economic costs in system failures
- The important of informing a person of authority of systems or service structures that may lead to unsafe practices which may put patients, yourself or other colleagues at risk
- Awareness of the Irish Medical Councils policy on raising concerns about safety in the environment in which you work

SKILLS

- Effective communication with patients, families and colleagues
- Co-operation and collaboration with colleagues to achieve safe and effective quality patient care
- Being an effective team player
- Ethical and legal decision making skills
- Minimising errors during invasive procedures by developing and adhering to best-practice guidelines for safe surgery
- Minimising medication errors by practicing safe prescribing principles
- Ability to learn from errors and near misses to prevent future errors
- Managing errors and near-misses
- Using relevant information from complaints, incident reports, litigation and quality improvement reports in order to control risks
- Managing complaints
- Using the Open Disclosure Process Algorithm

ASSESSMENT & LEARNING METHODS

- Consultant feedback at annual assessment
- Workplace based assessment e.g. Mini-CEX, DOPS, CBD
- Educational supervisor's reports on observed performance (in the workplace): prioritisation of patient safety in practice
- RCPI HST Leadership in Clinical Practice
- RCPI Ethics programmes
- Medical Council Guide to Professional Conduct and Ethics
- Reflective learning around ethical dilemmas encountered in clinical practice
- Quality improvement methodology course - recommended

Infection Control

Objective: To be able to appropriately manage infections and risk factors for infection at an institutional level, including the prevention of cross-infections and hospital acquired infection

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care; Management (including Self-Management).

KNOWLEDGE

Within a consultation

- The principles of infection control as defined by the HIQA
- How to minimise the risk of cross-infection during a patient encounter by adhering to best practice guidelines available, including the 5 Moments for Hand Hygiene guidelines
- The principles of preventing infection in high risk groups e.g. managing antibiotic use to prevent *Clostridium difficile*
- Knowledge and understanding of the local antibiotic prescribing policy
- Awareness of infections of concern, e.g. MRSA, *Clostridium difficile*
- Best practice in isolation precautions
- When and how to notify relevant authorities in the case of notifiable infectious disease
- Understanding the increased risk of infection to patients in surgery or during an invasive procedure and adhering to guidelines for minimising infection in such cases
- The guidelines for needle-stick injury prevention and management

During an outbreak

- Guidelines for minimising infection in the wider community in cases of communicable diseases and how to seek expert opinion or guidance from infection control specialists where necessary
- Hospital policy/seeking guidance from occupational health professional regarding the need to stay off work/restrict duties when experiencing infections the onward transmission of which might impact on the health of others

SKILLS

- Practicing aseptic techniques and hand hygiene
- Following local and national guidelines for infection control and management
- Prescribing antibiotics according to antibiotic guidelines
- Encouraging staff, patients and relatives to observe infection control principles
- Communicating effectively with patients regarding treatment and measures recommended to prevent re-infection or spread
- Collaborating with infection control colleagues to manage more complex or uncommon types of infection including those requiring isolation e.g. transplant cases, immunocompromised host
- In the case of infectious diseases requiring disclosure:
 - Working knowledge of those infections requiring notification
 - Undertaking notification promptly
 - Collaborating with external agencies regarding reporting, investigating and management of notifiable diseases
 - Enlisting / requiring patients' involvement in solving their health problems, providing information and education
 - Utilising and valuing contributions of health education and disease prevention and infection control to health in a community

ASSESSMENT & LEARNING METHODS

- Consultant feedback at annual assessment
- Workplace based assessment e.g. Mini-CEX, DOPS, CBD
- Educational supervisor's reports on observed performance (in the workplace): practicing aseptic techniques as appropriate to the case and setting, investigating and managing infection, prescribing antibiotics according to guidelines
- Completion of infection control induction in the workplace
- Personal Protective Equipment Training Course (In hospital)

Self-Care and Maintaining Well-Being

Objectives:

1. To ensure that trainees understand how their personal histories and current personal lives, as well as their values, attitudes, and biases affect their care of patients so that they can use their emotional responses in patient care to their patients' benefit
2. To ensure that trainees care for themselves physically and emotionally, and seek opportunities for enhancing their self-awareness and personal growth

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care, Relating to Patients, Communication and Interpersonal Skills, Collaboration and Teamwork, Management (including self-management).

KNOWLEDGE

- Self-awareness including preferences and biases
- Personal psychological strengths and limitations
- Understand how personality characteristics, such as need for approval, judgemental tendencies, needs for perfection and control etc., affect relationships with patients and others
- Knowledge of core beliefs, ideals, and personal philosophies of life, and how these relate to own goals in medicine
- Know how family-of-origin, race, class, religion and gender issues have shaped own attitudes and abilities to discuss these issues with patients
- Understand the difference between feelings of sympathy and feelings of empathy
- Know the factors between a doctor and patient that enhance or interfere with abilities to experience and convey empathy
- Understanding of own attitudes toward uncertainty and risk taking and own need for reassurance
- How own relationships with certain patients can reflect attitudes toward paternalism, autonomy, benevolence, non-maleficence and justice
- Recognise own feelings in straightforward and complex patient-doctor interactions
- Recognising the symptoms of stress and burn out

SKILLS

- Exhibiting empathy and showing consideration for all patients, their impairments and attitudes irrespective of cultural and other differences
- Ability to create boundaries with patients that allow for therapeutic alliance
- Challenge authority appropriately from a firm sense of own values and integrity and respond appropriately to situations that involve abuse, unethical behaviour and coercion
- Recognise own limits and seek appropriate support and consultation
- Work collaboratively and effectively with colleagues and other members of health care teams
- Manage effectively commitments to work and personal lives, taking the time to nurture important relationship and oneself
- Ability to recognise when falling behind and adjusting accordingly
- Demonstrating the ability to cope with changing circumstances, variable demand, being prepared to re-prioritise and ask for help
- Utilising a non-judgemental approach to patient's problem
- Recognise the warning signs of emotional ill-health in self and others and be able to ask for appropriate help
- Commitment to lifelong process of developing and fostering self-awareness, personal growth and well being
- Be open to receiving feedback from others as to how attitudes and behaviours are affecting their care of patients and their interactions with others
- Holding realistic expectations of own and of others' performance, time-conscious, punctual
- Valuing the breadth and depth of experience that can be accessed by associating with professional colleagues

ASSESSMENT & LEARNING METHODS

- On-going supervision
- RCPI Ethics programmes
- Wellness Matters Course
- RCPI HST Leadership in Clinical Practice course

Communication in Clinical and Professional Setting

Objective: To demonstrate the ability to communicate effectively and sensitively with patients, their relatives, carers and with professional colleagues in different situations.

Medical Council Domains of Good Professional Practice: Relating to Patients; Communication and Interpersonal Skills.

KNOWLEDGE

Within a consultation

- How to effectively listen and attend to patients
- How to structure an interview to obtain/convey information; identify concerns, expectations and priorities; promote understanding, reach conclusions; use appropriate language.
- How to empower the patient and encourage self-management

Difficult circumstances

- Understanding of potential areas for difficulty and awkward situations
- How to negotiate cultural, language barriers, dealing with sensory or psychological and/or intellectual impairments and how to deal with challenging or aggressive behaviour
- Knowing how and when to break bad news
- How to communicate essential information where difficulties exist, how to appropriately utilise the assistance of interpreters, chaperones, and relatives.
- How to deal with anger and frustration in self and others
- Selecting appropriate environment; seeking assistance, making and taking time

Dealing with professional colleagues and others

- How to communicate with doctors and other members of the healthcare team
- How to provide a concise, written, verbal, or electronic, problem-orientated statement of facts and opinions
- The legal context of status of records and reports, of data protection confidentiality
- Freedom of Information (FOI) issues
- Understanding of the importance of legible, accessible, records to continuity of care
- Knowing when urgent contact becomes necessary and the appropriate place for verbal, telephone, electronic, or written communication
- Recognition of roles and skills of other health professionals
- Awareness of own abilities/limitations and when to seek help or give assistance, advice to others; when to delegate responsibility and when to refer

Maintaining continuity of care

- Understanding the relevance of continuity of care to outcome, within and between phases of healthcare management
- The importance of completion of tasks and documentation, e.g. before handover to another team, department, specialty, including identifying outstanding issues and uncertainties
- Knowledge of the required attitudes, skills and behaviours which facilitate continuity of care including, being available and contactable, alerting others to avoid potential confusion or misunderstanding through communications failure

Giving explanations

- The importance of possessing the facts, and of recognising uncertainty and conflicting evidence on which decisions have to be based
- How to secure and retain attention avoiding distraction
- Understanding how adults receive information best, the relative value of the spoken, written, visual means of communication, use of reinforcement to assist retention
- Knowledge of the risks of information overload
- Tailoring the communication of information to the level of understanding of the recipient
- Strategies to achieve the level of understanding necessary to gain co-operation and partnership; compliance, informed choice, acceptance of opinion, advice, recommendation

Responding to complaints

- Value of hearing and dealing with complaints promptly; the appropriate level, the procedures (departmental and institutional); sources of advice, and assistance available
- The importance of obtaining and recording accurate and full information, seeking confirmation from multiple sources
- Knowledge of how to establish facts, identify issues and respond quickly and appropriately to a complaint received

SKILLS

- Ability to appropriately elicit facts, using a mix of open and closed-ended questions
- Using “active listening” techniques such as nodding and eye contact
- Giving information clearly, avoiding jargon, confirming understanding, ability to encourage co-operation, compliance; obtaining informed consent
- Showing consideration and respect for other’s culture, opinions, patient’s right to be informed and make choices
- Respecting another’s right to opinions and to accept or reject advice
- Valuing perspectives of others contributing to management decisions
- Conflict resolution
- Dealing with complaints
- Communicating decisions in a clear and thoughtful manner
- Presentation skills
- Maintaining (legible) records
- being available, contactable, time-conscious
- Setting realistic objectives, identifying and prioritising outstanding problems
- Using language, literature (e.g. leaflets) diagrams, educational aids and resources appropriately
- Establish facts, identify issues and respond quickly and appropriately to a complaint received
- Accepting responsibility, involving others, and consulting appropriately
- Obtaining informed consent
- Discussing informed consent
- Giving and receiving feedback

ASSESSMENT & LEARNING METHODS

- Mastering Communication course (Year 1)
- Consultant feedback at annual assessment
 - Workplace based assessment e.g. Mini-CEX, DOPS, CBD
 - Educational supervisor’s reports on observed performance (in the workplace): communication with others e.g. at handover. ward rounds, multidisciplinary team members
- Presentations
- RCPI Ethics programmes
- RCPI HST Leadership in Clinical Practice Course

Leadership

Objective: To have the knowledge, skills and attitudes to act in a leadership role and work with colleagues to plan, deliver and develop services for improved patient care and service delivery.

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care; Communication and Interpersonal Skill; Collaboration and Teamwork; Management (including Self-Management); Scholarship.

KNOWLEDGE

Personal qualities of leaders

- Knowledge of what leadership is in the context of the healthcare system appropriate to training level
- The importance of good communication in teams and the role of human interactions on effectiveness and patient safety

Working with others

- Awareness of own personal style and other styles and their impact on team performance
- The importance of good communication in teams and the role of human interactions on effectiveness and patient safety

Managing services

- The structure and function of Irish health care system
- Awareness of the challenges of managing in healthcare
 - Role of governance
 - Clinical directors
- Knowledge of planning and design of services
- Knowledge and understanding of the financing of the health service
 - Knowledge of how to prepare a budget
 - Defining value
 - Managing resources
- Knowledge and understanding of the importance of human factors in service delivery
 - How to manage staff training, development and education
- Managing performance
 - How to perform staff appraisal and deal effectively with poor staff performance
 - How to rewards and incentivise staff for quality and efficiency

Setting direction

- The external and internal drivers setting the context for change
- Knowledge of systems and resource management that guide service development
- How to make decisions using evidence-based medicine and performance measures
- How to evaluate the impact of change on health outcomes through ongoing service evaluation

SKILLS

- Effective communication with patients, families and colleagues
- Co-operation and collaboration with others; patients, service users, carers colleagues within and across systems
- Being an effective team player
- Ability to manage resources and people
- Managing performance and performance indicators

Demonstrating personal qualities

- Efficiently and effectively managing one-self and one's time especially when faced with challenging situations
- Continues personal and professional development through scholarship and further training and education where appropriate
- Acting with integrity and honesty with all people at all times
- Developing networks to expand knowledge and sphere of influence
- Building and maintaining key relationships
- Adapting style to work with different people and different situations
- Contributing to the planning and design of services

ASSESSMENT & LEARNING METHODS

- Mastering Communication course (Year 1)
- RCPI HST Leadership in Clinical Practice (Year 3 – 5)
- Consultant feedback at annual assessment
- Workplace based assessment e.g. Mini-CEX, DOPS, CBD
- Educational supervisor's reports on observed performance (in the workplace): on management and leadership skills
- Involvement in hospital committees where possible e.g. Division of Medicine, Drugs and Therapeutics, Infection Control etc.

Quality Improvement

Objective: To demonstrate the ability to identify areas for improvement and implement basic quality improvement skills and knowledge to improve patient safety and quality in the healthcare system.

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care; Communication and Interpersonal Skills; Collaboration and Teamwork; Management; Relating to Patients; Professionalism

KNOWLEDGE

Personal qualities of leaders

- The importance of prioritising the patient and patient safety in all clinical activities and interactions

Managing services

- Knowledge of systems design and the role of microsystems
- Understanding of human factors and culture on patient safety and quality

Improving services

- How to ensure patient safety by adopting and incorporating a patient safety culture
- How to critically evaluate where services can be improved by measuring performance, and acting to improve quality standards where possible
- How to encourage a culture of improvement and innovation

Setting direction

- How to create a 'burning platform' and motivate other healthcare professionals to work together within quality improvement
- Knowledge of the wider healthcare system direction and how that may impact local organisations

SKILLS

- Improvement approach to all problems or issues
- Engaging colleagues, patients and the wider system to identify issues and implement improvements
- Use of quality improvement methodologies, tools and techniques within every day practice
- Ensuring patient safety by adopting and incorporating a patient safety culture
- Critically evaluating where services can be improved by measuring performance, and acting to raise standards where possible
- Encouraging a culture of improvement and innovation

Demonstrating personal qualities

- Encouraging contributions and involvement from others including patients, carers, members of the multidisciplinary team and the wider community
- Considering process and system design, contributing to the planning and design of services

ASSESSMENT & LEARNING METHODS

- RCPI HST Leadership in Clinical Practice
- Consultant feedback at annual assessment
- Involvement in hospital committees where possible e.g. Division of Medicine, Drugs and Therapeutics, Infection Control etc.

Scholarship

Objective: To develop skills in personal/professional development, teaching, educational supervision and research

Medical Council Domains of Good Professional Practice: Scholarship

KNOWLEDGE

Teaching, educational supervision and assessment

- Principles of adult learning, teaching and learning methods available and strategies
- Educational principles directing assessment methods including, formative vs. summative methods
- The value of regular appraisal / assessment in informing training process
- How to set effective educational objectives and map benefits to learner
- Design and delivery of an effective teaching event, both small and large group
- Use of appropriate technology / materials

Research, methodology and critical evaluation

- Designing and resourcing a research project
- Research methodology, valid statistical analysis, writing and publishing papers
- Ethical considerations and obtaining ethical approval
- Reviewing literature, framing questions, designing a project capable of providing an answer
- How to write results and conclusions, writing and/or presenting a paper
- How to present data in a clear, honest and critical fashion

Audit

- Basis for developing evidence-based medicine, kinds of evidence, evaluation; methodologies of clinical trials
- Sources from which useful data for audit can be obtained, the methods of collection, handling data, the audit cycle
- Means of determining best practice, preparing protocols, guidelines, evaluating their performance
- The importance of re-audit

SKILLS

- Bed-side undergraduate and post graduate teaching
- Developing and delivering lectures
- Carrying out research in an ethical and professional manner
- Performing an audit
- Presentation and writing skills – remaining impartial and objective
- Adequate preparation, timekeeping
- Using technology / materials

ASSESSMENT & LEARNING METHODS

- An Introduction to Health Research (online)
- Performing audit course (online)
- Effective Teaching and Supervising Skills course (online) - recommended
- Educational Assessment Skills course - recommended
- Health Research Methods for Clinicians - recommended

Management

Objective: To understand the organisation, regulation and structures of the health services, nationally and locally, and to be competent in the use and management of information on health and health services, to develop personal effectiveness and the skills applicable to the management of staff and activities within a healthcare team.

Medical Council Domains of Good Professional Practice: Management.

KNOWLEDGE

Health service structure, management and organisation

- The administrative structure of the Irish Health Service, services provided in Ireland and their funding and how to engage with these for best results
- Department of Health, HSE and hospital management structures and systems
- The national regulatory bodies, health agencies and patient representative groups
- Understanding the need for business plans, annual hospital budgets, the relationship between the hospital and PCCC

The provision and use of information in order to regulate and improve service provision

- Methods of collecting, analysing and presenting information relevant to the health of a population and the apportionment of healthcare resources
- The common ways in which data is presented, knowing of the sources which can provide information relevant to national or to local services and publications available

Maintaining medical knowledge with a view to delivering effective clinical care

- Understanding the contribution that current, accurate knowledge can make to establishing clinical effectiveness, best practice and treatment protocols
- Knowledge of sources providing updates, literature reviews and digests

Delegation skills, empowerment and conflict management

- How to assess and develop personal effectiveness, improve negotiating, influencing and leadership skills
- How to manage time efficiently, deal with pressure and stress
- How to motivate others and operate within a multidisciplinary team

SKILLS

- Chairing, organising and participating in effective meetings
- Managing risks
- Managing time
- Delegating tasks effectively
- Managing conflicts
- Exploring, directing and pursuing a project, negotiating through the relevant departments at an appropriate level
- Ability to achieve results through an understanding of the organisation and its operation
- Ability to seek / locate information in order to define an issue needing attention e.g. to provide data relevant to a proposal for change, establishing a priority, obtaining resources
- Ability to make use of information, use IT, undertake searches and obtain aggregated data, to critically evaluate proposals for change e.g. innovative treatments, new technologies
- Ability to adjust to change, apply management, negotiating skills to manage change
- Appropriately using management techniques and seeking to improve these skills and personal effectiveness

ASSESSMENT & LEARNING METHODS

- Mastering Communication course
- Performing audit course (online)
- RCPI HST Leadership in Clinical Practice
- Annual audit
- Consultant feedback on management and leadership skills
- Involvement in hospital committees

Standards of Care

Objective: To be able to consistently and effectively assess and treat patients' problems

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care; Relating to Patients; Communication and Interpersonal Skills; Collaboration and Teamwork: Management (including Self-Management); Clinical Skills.

KNOWLEDGE

Diagnosing Patients

- How to carry out appropriate history taking
- How to appropriately examine a patient
- How to make a differential diagnosis

Investigation, indications, risks, cost-effectiveness

- The pathophysiological basis of the investigation
- Understand the clinical significance of reference ranges, positive and negative predictive value and potential risks of inappropriate tests
- The procedures for commonly used investigations, common or/and serious risks
- Understanding of the sensitivity and specificity of results, artefacts, PPV and NPV
- Understanding significance, interpreting and explaining results of investigations
- Logical approach in choosing, sequencing and prioritising investigations

Treatment and management of disease

- Natural history of diseases
- Quality of life concepts
- How to accurately assess patient's needs, prescribe, arrange treatment, recognise and deal with reactions / side effects
- How to set realistic therapeutic goals, to utilise rehabilitation services, and use palliative care approach appropriately
- Recognising that illness (especially chronic and/or incapacity) has an impact on relationships and family, having financial as well as social effects e.g. driving

Disease prevention and health education

- Screening for disease: methods, advantages and limitations
- Health promotion and support agencies; means of providing sources of information for patients
- Risk factors, preventive measures, and change strategies applicable to smoking, alcohol, drug abuse, and lifestyle
- Disease notification; methods of collection and sources of data

Notes, records, correspondence

- Functions of medical records, their value as an accurate up-to-date commentary and source of data
- An understanding of the need and appropriate use of problem-orientated discharge notes, letters, more detailed case reports, concise out-patient reports and focused reviews
- Appreciating the importance of up-to-date, easily available, accurate information, and the need for communicating promptly e.g. with primary care

Prioritising, resourcing and decision taking

- How to prioritise demands, respond to patients' needs and sequence urgent tasks
- Establishing (clinical) priorities e.g. for investigations, intervention; how to set realistic goals; understanding the need to allocate sufficient time, knowing when to seek help
- Understanding the need to complete tasks, reach a conclusion, make a decision, and take action within allocated time
- Knowing how and when to conclude

Handover

- Know what are the essential requirements to run an effective handover meeting
 - Sufficient and accurate patients information
 - Adequate time
 - Clear roles and leadership
 - Adequate IT
- Know how to prioritise patient safety
 - Identify most clinically unstable patients
 - Use ISBAR (Identify, Situation, Background, Assessment, Recommendations)
 - Proper identification of tasks and follow-ups required
 - Contingency plans in place
- Know how to focus the team on actions
 - Tasks are prioritised
 - Plans for further care are put in place
 - Unstable patients are reviewed

Relevance of professional bodies

- Understanding the relevance to practice of standards of care set down by recognised professional bodies – the Medical Council, Medical Colleges and their Faculties, and the additional support available from professional organisations e.g. IMO, Medical Defence Organisations and from the various specialist and learned societies

SKILLS

- Taking and analysing a clinical history and performing a reliable and appropriate examination, arriving at a diagnosis and a differential diagnosis
- Liaising, discussing and negotiating effectively with those undertaking the investigation
- Selecting investigations carefully and appropriately, considering (patients') needs, risks, value and cost effectiveness
- Appropriately selecting treatment and management of disease
- Discussing, planning and delivering care appropriate to patient's needs and wishes
- Preventing disease using the appropriate channels and providing appropriate health education and promotion
- Collating evidence, summarising, recognising when objective has been met
- Screening
- Working effectively with others including
 - Effective listening
 - Ability to articulate and deliver instructions
 - Encourage questions and openness
 - Leadership skills
- Ability to prioritise
- Ability to delegate effectively
- Ability to advise on and promote lifestyle change, stopping smoking, control of alcohol intake, exercise and nutrition
- Ability to assess and explain risk, encourage positive behaviours e.g. immunisation and preventive measures
- Involve patients' in solving their health problems, by providing information and education
- Availing of support provided by voluntary agencies and patient support groups, as well as expert services e.g. detoxification / psychiatric services
- Act in accordance with, up to date standards on palliative care needs assessment
- Valuing contributions of health education and disease prevention to health in a community
- Compile accurate and appropriate detailed medical notes and care reports including the results of examinations, investigations, procedures performed, sufficient to provide an accurate, detailed account of the diagnostic and management process and outcome, providing concise, informative progress reports (both written and oral)
- Transfer information in an appropriate and timely manner

- Maintaining legible records in line with the Guide to Professional Conduct and Ethics for Registered Medical Practitioners in Ireland
- Actively engaging with professional/representative/specialist bodies

ASSESSMENT & LEARNING METHODS

- Consultant feedback
- Workplace based assessment e.g. Mini-CEX, DOPS, CBD
- Educational supervisor's reports on observed performance (in the workplace)
- Annual Audit
- Medical Council Guide to Professional Conduct and Ethics

Dealing with & Managing Acutely Ill Patients in Appropriate Specialties

Objectives: To be able to assess and initiate management of patients presenting as emergencies, and to appropriately communicate the diagnosis and prognosis. Trainees should be able to recognise the critically ill and immediately assess and resuscitate if necessary, formulate a differential diagnosis, treat and/or refer as appropriate, elect relevant investigations and accurately interpret reports.

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care, Clinical Skills.

KNOWLEDGE

Management of acutely ill patients with medical problems

- Presentation of potentially life-threatening problems
- Indications for urgent intervention, the additional information necessary to support action (e.g. results of investigations) and treatment protocols
- When to seek help, refer/transfer to another specialty
- ACLS protocols
- Ethical and legal principles relevant to resuscitation and DNAR in line with National Consent Policy
- How to manage acute medical intake, receive and refer patients appropriately, interact efficiently and effectively with other members of the medical team, accept/undertake responsibility appropriately
- Management of overdose
- How to anticipate / recognise, assess and manage life-threatening emergencies, recognise significantly abnormal physiology e.g. dysrhythmia and provide the means to correct e.g. defibrillation
- How to convey essential information quickly to relevant personnel: maintaining legible up-to-date records documenting results of investigations, making lists of problems dealt with or remaining, identifying areas of uncertainty; ensuring safe handover

Managing the deteriorating patient

- How to categorise a patients' severity of illness using Early Warning Scores (EWS) guidelines
- How to perform an early detection of patient deterioration
- How to use a structured communication tool (ISBAR)
- How to promote an early medical review, prompted by specific trigger points
- How to use a definitive escalation plan

Discharge planning

- Knowledge of patient pathways
- How to distinguish between illness and disease, disability and dependency
- Understanding the potential impact of illness and impairment on activities of daily living, family relationships, status, independence, awareness of quality of life issues
- Role and skills of other members of the healthcare team, how to devise and deliver a care package
- The support available from other agencies e.g. specialist nurses, social workers, community care
- Principles of shared care with the general practitioner service
- Awareness of the pressures/dynamics within a family, the economic factors delaying discharge but recognise the limit to benefit derived from in-patient care

SKILLS

- BLS/ACLS (or APLS for Paediatrics)
- Dealing with common medical emergencies
- Interpreting blood results, ECG/Rhythm strips, chest X-Ray, CT brain
- Giving clear instructions to both medical and hospital staff
- Ordering relevant follow up investigations
- Discharge planning, including complex discharge
- Knowledge of HIPE (Hospital In-Patient Enquiry)
- Multidisciplinary team working
- Communication skills
- Delivering early, regular and on-going consultation with family members (with the patient's permission) and primary care physicians
- Remaining calm, delegating appropriately, ensuring good communication
- Attempting to meet patients'/ relatives' needs and concerns, respecting their views and right to be informed in accordance with Medical Council Guidelines
- Establishing liaison with family and community care, primary care, communicate / report to agencies involved
- Demonstrating awareness of the wide ranging effects of illness and the need to bridge the gap between hospital and home
- Categorising a patients' severity of illness
- Performing an early detection of patient deterioration
- Use of structured communication tools (e.g. ISBAR)

ASSESSMENT & LEARNING METHODS

- ACLS course
- Record of on call experience
- Mini-CEX (acute setting)
- Case Based Discussion (CBD)
- Consultant feedback

Therapeutics and Safe Prescribing

Objective: To progressively develop ability to prescribe, review and monitor appropriate therapeutic interventions relevant to clinical practice in specific specialities including non-pharmacological therapies and preventative care.

Medical Council Domains of Good Professional Practice: Patient Safety and Quality of Patient Care.

KNOWLEDGE

- Pharmacology, therapeutics of treatments prescribed, choice of routes of administration, dosing schedules, compliance strategies; the objectives, risks and complications of treatment cost-effectiveness
- Indications, contraindications, side effects, drug interaction, dosage and route of administration of commonly used drugs
- Commonly prescribed medications
- Adverse drug reactions to commonly used drugs, including complementary medicines
- Identifying common prescribing hazards
- Identifying high risk medications
- Drugs requiring therapeutic drug monitoring and interpretation of results
- The effects of age, body size, organ dysfunction and concurrent illness or physiological state e.g. pregnancy on drug distribution and metabolism relevant to own practice
- Recognising the roles of regulatory agencies involved in drug use, monitoring and licensing e.g. IMB, and hospital formulary committees
- Procedure for monitoring, managing and reporting adverse drug reaction
- Effects of medications on patient activities including potential effects on a patient's fitness to drive
- The role of The National Medicines Information Centre (NMIC) in promoting safe and efficient use of medicine
- Differentiating drug allergy from drug side effects
- Know the difference between an early and late drug allergy, and drug side-effects
- Good Clinical Practice guidelines for seeing and managing patients who are on clinical research trials
- Best practice in the pharmacological management of cancer pain
- The management of constipation in adult patients receiving palliative care

SKILLS

- Writing a prescription in line with guidelines
- Appropriately prescribing for the elderly, children and pregnant and breast feeding women
- Making appropriate dose adjustments following therapeutic drug monitoring, or physiological change (e.g. deteriorating renal function)
- Reviewing and revising patients' long term medications
- Anticipating and avoiding defined drug interactions, including complementary medicines
- Advising patients (and carers) about important interactions and adverse drug effects including effects on driving
- Providing comprehensible explanations to the patient, and carers when relevant, for the use of medicines
- Being open to advice and input from other health professionals on prescribing
- Participating in adverse drug event reporting
- Take and record an accurate drug allergy history and history of previous side effects

ASSESSMENT & LEARNING METHODS

- Consultant feedback
- Workplace based assessment e.g. Mini-CEX, DOPS, CBD
- Educational supervisor's reports on observed performance (in the workplace): prioritisation of patient safety in prescribing practice
- Guidance for health and social care providers - Principles of good practice in medication reconciliation (HIQA)

Specialty Section

Fundamental Skills

Objective: to gain fundamental health and safety laboratory behaviours.

KNOWLEDGE

- Thorough understanding of laboratory health and safety practice
- Safe handling of clinical samples in the laboratory
- Understanding of quality assurance and accreditation in the diagnostic laboratory
- Develop core reporting skills
- Understanding of microbiology, mycology virology and parasitology sufficient to offer advice on the interpretation of laboratory results
- Manage common medical emergencies relevant to clinical practice
- Understand the importance of infectious disease notifications and the relationship of the laboratory with the local consultant in public health medicine
- Understand the role of the Health Protection Surveillance Centre
- Aware of national and relevant international guidelines and where to find them
- Recognise critical incidents and understand how to manage them
- Understand the importance of clinical audit and risk management.

SKILLS

- Safe handling of clinical samples in the laboratory
- Clinical Audit and Risk management
- Function as part of a multidisciplinary team

ASSESSMENT & LEARNING METHODS

- FRCPATH
- Mini-CEX
- DOPS

Core Knowledge

Objective: To achieve sufficient understanding of laboratory microbiology and virology to offer advice on relevant investigations, infection control procedures and interpretation of results.

KNOWLEDGE

- Basic Biology
 - Understanding of :
 - basic biology (structure, genetics, taxonomy, epidemiology) of major bacterial, viral, fungal and parasitic agents
 - the immune response to infection
 - differences between cellular and humoral immunity
 - how vaccines work
 - molecular biology
 - genetic susceptibility to pathogens and disease
- Host pathogen relationships
 - Understanding of how the immune response protects against infection, and how it may contribute to pathogenesis of infectious diseases.
 - Different types of host-parasite relationships, e.g. symbiosis, viral latency, quasispecies evolution, etc.
 - Awareness of types of immunodeficiency and how they affect susceptibility to and control of infectious diseases.
 - Able to explain pathogenic mechanisms involved in common infectious diseases and the role of host response in immunopathology
- Health and Safety Authority (HSA) classification of pathogens
 - Understand principles of standard precautions, hazard groups and containment levels.
- Standards of Practice
 - Understand importance and relevance to good laboratory practice.
 - Understanding of the importance of laboratory safety
 - Understand the evidence base behind standard operating procedures (SOPs) and the importance of audit and quality control and accreditation to establish validity.
- Basic principles of diagnostic microbiology and virology
 - be able to explain the range of tests available, and the circumstances in which they are used
 - sample processing for microbiology and virology according to Standard Operating Procedures
 - understanding of molecular techniques available such as polymerase chain reaction (PCR)
 - understanding of antimicrobial and antiviral susceptibility testing and its interpretation
 - understanding of basic principles behind monitoring of drug levels and its uses
 - Have a general understanding of the management of the following:
 - genitourinary tract infection including sexually transmitted infections (STIs)
 - urinary tract infection
 - respiratory tract infection
 - gastrointestinal infections
 - skin and soft tissue infection
 - eye infection
 - post-operative infection
 - sharps injuries
 - encephalitis/meningitis
 - hepatitis including test interpretation
 - infections in pregnancy, including methods of diagnosis, and implications of infection for mother and foetus
 - congenital infection and infection acquired perinatally
 - infections in the immunocompromised including basic understanding of how to make the diagnosis of infection and treatment options
 - invasive infection (e.g. septicaemia, endocarditis, bone infection)

- common health care associated infection (e.g. device-associated infection)
 - infection in travellers (e.g. malaria)
- Treatment and prevention strategies
 - Understanding and knowledge of the range of therapies available for infectious disease, the clinical indications for their use and their side effects.
 - Detailed understanding of antimicrobial agents.
 - Detailed understanding of the mechanism of action of all antimicrobial agents and mechanisms for development of resistance to these agents.
 - Understanding of the principles of treatment and prophylaxis, both with antimicrobials and with immune globulins.
 - Familiarity with existing vaccines and schedules of immunisation
 - Understanding of pathogenesis of antibiotic allergy and awareness of desensitisation protocols
- Infection Prevention and control
 - Understanding of routes of transmission and methods of preventing spread of common and important infecting organisms in the health care setting, e.g.:
 - methicillin-resistant *Staphylococcus aureus*
 - vancomycin-resistant enterococci
 - varicella zoster virus
 - enteric infections including viral diarrhoea
 - respiratory tract infections (including influenza and tuberculosis)
 - blood-borne viruses
 - extended-spectrum beta-lactamase-producing organisms (ESBLs) and carbapenemase producing *Enterobacteriaceae* (CPE)
 - multiply-resistant *Acinetobacter baumannii*
 - *Clostridium difficile* - associated diarrhoea
 - Understand issues surrounding the isolation of the febrile traveller
 - Understand the infection control implications of planning construction and refurbishment
 - Understand the principles and practice of surveillance and public health with particular regard to food-borne and vaccine-preventable infections and Sexually Transmitted Infections
 - Be aware of emerging infections
 - Understand principles of outbreak recognition and management
- Sterilisation and disinfection
 - Definition of terms
 - Basic understanding of the different methods available
 - Awareness of the importance of removal of pathogenic organisms in the prevention of infection

SKILLS

- Ability to distinguish between sterile and contaminated/colonised body sites
- Ability to identify common viral/microbial pathogens with confirmation of identity, and distinction between significant and non-significant pathogens
- Able to understand basic techniques for serological and molecular diagnosis in infectious diseases
- Outline the principles of epidemiology, presentation, diagnosis and management of clinical syndromes
- Ability to recognise potential community-acquired and nosocomial infections and the role of environmental factors (e.g. food, water, air)
- Demonstration of competence in taking relevant clinical/infection history
- Demonstration of competence in recording and communicating microbiological advice

ASSESSMENT & LEARNING METHODS

- Participation in journal clubs and departmental meetings
- DOPS
- Case Based Discussion (CBD)
- FRCPATH

Out-of-Hours' Working

Objective: Provision of a consultative service for medical microbiology outside of routine laboratory working hours is a vital part of training in medical microbiology. It develops decision-making skills and enables prioritisation. It is essential that such experience is acquired throughout the whole training period as this will ensure that the necessary depth and breadth of experience and progression from supervised to competent independent practice is acquired by the time training is complete. The amount of time allotted to out-of-hours will be dependent on local factors. The point at which trainees begin out-of-hours working will be determined by previous experience and individual competence as assessed by the educational supervisor but would generally be after the initial three month introductory period is complete.

KNOWLEDGE

- Increasing familiarity with laboratory and clinical aspects (including control of infection, public and occupational health) aspects of bacterial, viral and related infections
- Knowledge of what is urgent and what can be left for the next working day

SKILLS

- Recognise one's own limitations in knowledge
- Liaise and respond to ensure continuity of care
- Refer to seniors as appropriate
- Prioritise regarding urgency
- Deal with difficult situations independently

ASSESSMENT & LEARNING METHODS

- Review of cases with colleagues at hand over
- CBD
- FRCPATH

Laboratory Aspects of Microbiology

Objective: To be competent in the management of the microbiology laboratory.

KNOWLEDGE

- Understanding of appropriate staining and culture techniques
- Susceptibility testing
 - Understanding current techniques for susceptibility testing including disc diffusion, gradient strip MIC methods, broth dilution and automated methodologies with appropriate quality control
 - Understand and be able to apply the concepts of wild type distribution, and interpretive breakpoints and be familiar with the principal bodies that set breakpoint interpretive criteria
 - Understand the use and limitations of the antibiogram for subtyping isolates of a given species during outbreak investigation
- Understand serologic and antigen-based diagnostic techniques
- Molecular diagnostic techniques
 - Have knowledge of the principles of molecular diagnostic techniques
- Knowledge of automated and semi-automated methodologies in microbiology. Near-patient testing
 - Be aware of automated culture and identification methodologies
- Knowledge of typing methods available
 - Understand the principles, advantages and limitations of various phenotypic and genotypic methods
 - Understand the role of typing in incident/outbreak investigations
- Reference centres
 - Ability to determine or comply with the indications for referral of specimens to reference facilities
 - Understands regulations on transportation of samples
- Principles of laboratory management. External bodies/Institutions relevant to service and their role. Familiarity with
 - staff performance management and appraisals
 - team working
 - time management
 - decision making and prioritisation skills
 - negotiation skills
 - managing underperformance
 - wider organisational issues, e.g. restructuring of laboratory services
- Knowledge of laboratory accreditation
- Familiar with:
 - external quality control including
 - National External Quality Assessment Service (NEQAS) schemes
 - Irish National Accreditation Board
 - International Standards Organisation ISO 15189 document (accreditation of medical laboratories)
 - internal quality control and internal quality assurance
 - commercially available laboratory computer systems

SKILLS

- Process common samples received in the laboratory and carry out further tests necessary for full identification of pathogens
- Provide clinical advice based on interpretation of susceptibility testing
- Ability to perform and interpret results serological tests for infectious disease
- Be able to select appropriate tests and interpret (advantages and limitations) molecular diagnostic techniques
- Ability to recommend appropriate typing methods for clinical situations and interpret the results.

ASSESSMENT & LEARNING METHODS

- FRCPATH
- HST Leadership for Pathology
- DOPS: Microscopy
 - Direct microscopy on CSF
 - Fluorescence microscopy
 - Culture a clinical sample
 - Anti-microbial susceptibility testing (Year 1)
 - Chair a departmental meeting

Knowledge of Health and Safety

Objective:

- to obtain an in-depth understanding of health and safety issues both locally and nationally in order to practise 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

KNOWLEDGE

- Be aware of the current legislative framework underpinning health and safety (H&S) at work, including:
 - Health and Safety at Work Act (2005) (Ireland)
 - Genetically Modified Organisms (Contained Use)

SKILLS

- Be able to perform an infection-control oriented risk assessment when required for all procedures undertaken in the hospital, including the laboratory, for all categories of worker, including the pregnant and immunocompromised.

ASSESSMENT & LEARNING METHODS

- CBD: Infection control risk assessment
- Study day
- FRCPath

Antimicrobial Stewardship

Objective: To be able to establish and manage an antimicrobial stewardship (AMS) programme at an institutional level.

KNOWLEDGE

- The principles of AMS as defined by HIQA
- The governance structures surrounding an AMS programme
- The principles of developing and implementing an antimicrobial guideline
- The role of education and audit in an AMS programme
- The key deliverables in the provision of an AMS programme
- Understanding the available tools and knowing where to utilise them in delivering AMS
- Awareness and knowledge of the means of thoughtful use of antimicrobials of concern e.g. carbapenems
- Understanding the utility of out-patient parenteral therapy and oral switch programmes
- The principles of surgical prophylaxis

SKILLS

- Following local and national guidelines
- Encouraging others (doctors, pharmacists, nurse) to embrace AMS principles
- Educating staff in AMS
- Communicating and collaborating with prescribing clinicians, medical laboratory scientists, infection prevention and control nursing staff and pharmacists to ensure AMS principles are embraced and implemented effectively
- Delivering an AMS message at every clinical decision making point
- Communicating an AMS message effectively to patients in both hospital and the primary care setting.

ASSESSMENT & LEARNING METHODS

- Consultant feedback at annual assessment
- Workplace based assessment e.g. Mini-CEX, DOPS, CBD
- Educational supervisor's reports on observed performance in the workplace: practicing AMS in all clinical settings, preparing anti-microbial guidelines and designing and conducting audit.

Clinical Microbiology

Objective: By the end of the educational programme, trainees would be expected to be able to advise on diagnosis, treatment and prevention of the following clinical problems:

- Common infections in the community
- Health care associated infection and infection prevention and control
- Infection in immunocompromised patients including HIV, transplantation and neutropenia
- Infection in critical care
- Outbreaks of infection in hospital and the community
- Infection in the returning traveller
- Food and water borne infection
- Sexually transmitted infection
- Occupationally acquired disease
- Paediatric infection
- Infection in pregnancy
- Eye infections
- Hepatitis virus infection
- Intra-abdominal infection
- Bone and joint infection
- Infections in patients with Cystic Fibrosis
- Infections in Pregnancy

Infectious Diseases

Objective: This training is to provide trainees with basic but comprehensive training which will enhance their clinical experience in the diagnosis and management of infectious diseases and further their understanding of the functioning and requirements of an Infectious Diseases Clinical Service.

During this period the trainee should have training in care of patients with infection under the clinical supervision of an infectious disease or other consultant who is responsible for the management of patients with infection.

This should include

- experience obtained at a specialised HIV inpatient unit
- clinical infection consult duties
- appropriate infectious disease clinics where the major focus of the clinic is managing patients with infection.
- A combination of clinics could include:
 - HIV clinic
 - Viral hepatitis clinic
 - General Infectious Disease (ID) clinic
 - Travel clinic
 - TB clinic
 - GUM clinic
 - OPAT

Fundamental Skills

- A broad knowledge of clinical presentation of infectious diseases.
- Also the ability to reach a specific or differential diagnosis and to initiate appropriate treatment.
- Knowledge of optimum treatment of infections.
- Ability to diagnose, investigate and manage community acquired infection.
- Clinical competence in the initial management of immunocompromised patients including those suffering from HIV/AIDS.
- Ability to recognise clinical manifestations in the immunocompromised patient, including the ability to evaluate and take appropriate history, perform a physical examination and carry out appropriate investigations
- Knowledge of the principles of the development ID services.
- Competence in the management of cross specialty infections for example TB, hepatitis including B and C.
- Knowledge of the care of Immunocompromised (congenital or acquired) patients.

KNOWLEDGE

- Knowledge of the pathological basis and clinical symptoms and signs of infection.
- Pharmacokinetics and mode of action of available therapy.
- Mechanisms of resistance/cross resistance.
- Awareness of evolving regional antimicrobial resistance data.
- Knowledge of the pathophysiology and clinical symptoms and signs of infection in compromised host and understand their relevance
- Biological and iatrogenic aetiology of immunodeficiency.
- The cost and economy and safety of the investigations in the immunocompromised.
- Awareness and knowledge of patient support groups.
- Specific issues which arise in the management of HIV Positive Patient cohorts such as, Pregnancy and conception, co-infection (HBV, HCV, TB), non-nationals, injection drug users, end stage disease and palliative care.
- Spectrum of professional and complementary therapies available.

- Palliative medicine, nutrition, pain relief, psychology of dying.
- Knowledge on how to provide Consult service
- Knowledge on how to access further information e.g. on current guidelines etc
- Principles of travel medicine.
- Availability, efficacy and safety of vaccines.
- Use and safety of antimalarial prevention measures.
- Principles of organising a travel clinic.
- Programme development – OPD services, home antibiotic services.
- Principles of development of sexual health services.
- Clinical and epidemiological features of imported diseases, especially manifestations and differential diagnosis of malaria.

Ability to organise administrative and clinical services.

Ability to initiate and co-ordinate an effective consultation service.

Capacity to work with multidisciplinary team members and colleagues.

Establishing close rapport and understanding with laboratory staff.

Recognising the need of a patient to understand procedures and results of tests.

Interpersonal skills

Capacity to impart knowledge

SKILLS

- Elicit appropriate physical signs.
- Ability to give targeted differential diagnosis
- Evaluation of patient and risk assessment
- Unbiased application of knowledge to the clinical situation.
- Ability to recognise clinical and laboratory manifestations of immunodeficiency.
- Ability to explain the procedures to the patient, ensure that patient discomfort is minimised.
- Consider interaction of psychological and social well being on the physical symptoms.
- Ability to recommend appropriate drug regimens.
- Appropriate use of guidelines.
- Monitor for and recognise side effects.
- Ability to appropriately triage patients for in-patient and out-patient care.
- Assessment of level of immunodeficiency and infection risk.
- Assessment of risk for and diagnosis of concurrent infection.
- Immunodeficiency complications in specific patient cohorts – transplant patients, oncology patients, haematology patients, patients receiving biological modifiers.
- Communication skills allowing patients to recognise risk activity and its management.
- Multidisciplinary team working
- Prepared to work with patient support groups.
- Understanding of resistance/cross resistance
- Understanding of evidence based guidelines
- Facilitate patient decision-making based on knowledge and understanding of the issues.
- Risk assessment for the individual traveller.
- Ability to take and record pre-travel medical and travel history.
- Ability to perform risk assessment appropriate to traveller.
- Recognise symptoms and signs of imported disease.
- Synthesise epidemiological and clinical data into differential diagnosis.
- Select and interpret appropriate diagnostic tests.

- Ability to manage common imported infections.

ASSESSMENT & LEARNING METHODS

- Mini-CEX
- DOPS
- CBD

Infection in the Community

Objective: understanding of infection in primary care, with reference to epidemiology, diagnosis, treatment and prevention.

KNOWLEDGE

- A broad knowledge of the aetiology and clinical presentation of infectious diseases
- Knowledge of the pathophysiology of the disease process, with particular reference to common and important infections such as urinary tract infection and respiratory tract infection
- Knowledge of the optimum treatment of infections and how to access current guidelines
- Knowledge of the epidemiological consequences of different diseases and of the systems available for disease control with reference to: tuberculosis (TB), viral hepatitis, genitourinary disease, immunisation strategies
- Knowledge of structures of local and national organisation of Public Health Medicine

SKILLS

- Assimilate clinical, laboratory and epidemiological information and to use this to differentiate between infections and other conditions
- Select and interpret appropriate tests
- Achieve a specific or differential diagnosis
- Selection of the appropriate therapeutic antimicrobial in the clinical setting
- Liaison between clinicians and laboratory
- Make accurate risk assessment
- Recognise when urgent epidemiological action is required

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- FRCPath

Health Care Associated Infection and Infection Prevention and Control

Objective: Understanding of specific problems related to healthcare-associated infections (HCAs).

KNOWLEDGE

- The reservoirs, sources, routes of transmission and portals of entry of common health care associated infections
- The interactions between the microbe, the patient risk factors and others in the environment, e.g. device and antimicrobial exposure
- The importance of the colonised patient and infected or colonised staff
- Epidemiology and control of common and important multi-resistant organisms, e.g. methicillin-resistant *Staphylococcus aureus* (MRSA), glycopeptide-resistant enterococci (GRE), *Clostridium difficile*, *Extended-spectrum beta-lactamase (ESBL)* and *carbapenemase producing Enterobacteriaceae*
- Disinfection and sterilisation in the hospital and primary care settings
- Knowledge and definitions of site, organism and specialty specific infections
- Common infections associated with particular surgical procedures, device-associated infections
- HCAs in the neonatal intensive care unit (NICU), burns units, dermatology wards, dialysis unit etc.
- Understanding of the evidence base behind current recommendations on management in specific clinical situations
- Surveillance:
 - Definitions of infections, methods of data collection and validation, approaches to analysis of data, interpretation of data
 - Understand surveillance by objective, problems of methodology
- Evidence base for effectiveness of local, national and international standards guidelines, protocols for infection and antimicrobial prescribing control and prevention, including screening and isolation strategies and antimicrobial stewardship
- The audit cycle and interaction with surveillance cycles
- Importance of health care associated infections in total quality management, controls assurance, review body inspections, e.g. Health Information and Quality Authority (HIQA)
- The roles and responsibilities of and the ability to describe the infection control team and committee
- Clinical waste, laundry and kitchen: their relevance and importance in HCAI prevention and control
 - Ability to describe these, including audit approaches
- Ventilation: importance of this in the theatre, isolation rooms and other areas, e.g. pharmacy and laboratory
- An understanding of ward, departmental and operating theatre design & layout
- Understanding of HCAI in the community, and community institutions

SKILLS

- Describe the dynamics of common HCAs
- Distinguish infection from colonisation
- Recommend antimicrobial treatment or prophylaxis appropriate to the clinical situation
- Describe the development and execution of infection and prescribing control policies and processes in the hospital setting
- Describe the processes and evidence of interactions with, for example, controls assurance assessments
- Describe the principles and importance of ventilation, e.g. in surgical site infection, prevention of spread of TB
- Interpret regulations with regard to hospital design and function
- Describe the various processes of disinfection and sterilisation in the hospital and primary care settings, their indications advantages and limitations
- Manage non-compliance with sterilisation procedure in RMID

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- FRCPath

Immunocompromised Patients Including HIV, Transplantation and Neutropenia

Objective: Understanding of specific problems related to opportunistic infection including preventative diagnostic and therapeutic strategies.

KNOWLEDGE

- Pathophysiology and clinical signs and symptoms of infection in compromised hosts
- Knowledge of iatrogenic and other causes of immunodeficiency
- Knowledge of available diagnostic techniques and their limitations
- Knowledge of available therapeutic option and preventative measures

SKILLS

- Recognise clinical and laboratory manifestations of immunodeficiency
- Understand the causes and risk factors and perform a risk assessment
- Perform and interpret investigations relevant to the patient and achieve specific or differential diagnosis and initiate appropriate treatment
- Awareness of risk-benefit analyses
- Rational use of resources

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- Journal clubs
- Case conferences
- FRCPATH

Infection in Critical Care and Sepsis

Objective: Understand the specific infection problems related to the ICU and the consequences of infection including sepsis syndrome.

KNOWLEDGE

- Common infection problems in the ICU setting, e.g. ventilator-associated pneumonia, line-infections, septicaemia
- Outcomes of infection
- Evidence-base for diagnosis and management
- Pathophysiology of serious sepsis
- Rationale for interventions
- Knowledge of surviving sepsis guidelines

SKILLS

- Recognition and management of specific infection problems in the critically ill
- Justify a course of action
- Communication skills
- Recognition of the consequences of severe infection including disseminated intravascular coagulation (DIC) and sepsis syndrome
- Ability to advise on appropriate therapy for sepsis syndrome

ASSESSMENT & LEARNING METHODS

- Participation in ICU rounds
- CBD
- FRCPath

Outbreaks of Infection in Hospitals and the Community

Objective: To be able to recognise and deal effectively with outbreaks of infection.

KNOWLEDGE

- General principles of outbreak investigation and control
- Understand fully local (including out-of-hours) procedures for the prevention and control of infectious diseases
 - Ability to access other sources of information and support when appropriate
 - Use of appropriate IT methodologies and statistics

SKILLS

- Ability to identify an outbreak
- Use of surveillance to identify incidents/outbreaks
- Recognition of abnormal patterns of infection
- Ability to initiate investigation and control measures
- Recognition of the role of others in outbreak management:
 - Public health
 - HPSC
 - Occupational health department
 - Reference laboratories
 - Infection prevention and control nurses
 - Surveillance scientists
- Ability to deal with the unexpected
- Ability to communicate (both in writing and verbally) with colleagues, the media and the public

ASSESSMENT & LEARNING METHODS

- FRCPATH
- CBD - Management of an outbreak infection
- Mastering Communications
- HST Leadership for Pathology

Infection in the Returning Traveller

Objective: to understand the burden of infectious disease associated with travel to low income countries and/or tropical climates. , Be able to advise on appropriate investigation and management of patients who have recently returned from travelling outside of Ireland / Europe..

KNOWLEDGE

- Knowledge of the common causes of infection in returning travellers
- Knowledge of common measures for preventing infection in travellers
- Malaria - Diagnosis, prevention and treatment
- Viral haemorrhagic fever
- Aware of emerging or imported infections, e.g. West Nile virus,
- Epidemiology and distribution of common tropical infections, e.g. malaria, schistosomiasis, onchocerciasis, filariasis, trypanosomiasis, gastro-intestinal GIT parasites, dengue, yellow fever, TB, HIV, enteric fever, cholera, dysentery

SKILLS

- Basic skills in the diagnosis of the above infections
- Investigation and diagnosis of travellers with specific presentations, e.g. diarrhoea, fever, lymphadenopathy, soft tissue involvement
- Principles of travel vaccination, malaria prophylaxis
- Clinical and epidemiological assessment and initial management of viral haemorrhagic fever and other imported infections

ASSESSMENT & LEARNING METHODS

- FRCPATH
- Study Day
- CBD
- Journal clubs
- Case conference
- National and international society meetings

Food-and Water-Borne Infection

Objective: basic understanding of food and waterborne infection and the public health and infection control requirements of such infections.

KNOWLEDGE

- Knowledge of the common pathogens involved in food- and water-borne infections and the laboratory methods used to test for them, including the use of indicator organisms
- Understand the role of the HPSC, Public health laboratories and Health Protection Surveillance Centre, Food Safety Authority of Ireland and environmental health colleagues
- Basic knowledge of the current legislation and guidelines on the microbiological testing of food and water. (Food includes milk and dairy products; water includes potable and bathing waters)
- Knowledge of the prevention and control of legionella/pseudomonas in water supplies
- Knowledge of the requirements for testing endoscopy rinse water and renal unit water and the results that should be achieved

SKILLS

- Ability to select the appropriate tests and interpret their results.

ASSESSMENT & LEARNING METHODS

- Study Day
- FRCPATH
- Journal clubs
- Bench time in food and water microbiology laboratories

Sexually Transmitted Infection

Objective: Understanding STIs, including diagnostic, therapeutic and preventative strategies.

KNOWLEDGE

- A broad knowledge of the aetiology, pathophysiology and clinical presentation of STIs
 - Awareness of the prevalence of STIs
 - Ability to assimilate clinical, laboratory and epidemiological information and to use this to differentiate between the different STIs
 - Ability to achieve a specific or differential diagnosis
- Knowledge of the available diagnostic tests and their limitations
 - Understanding of methods of diagnosis – culture, serology, antigen detection, ELISA, nucleic acid amplification testing (NAAT)
 - Appreciation of the advantages and disadvantages of different diagnostic methods
 - Rational use of resources
- Knowledge of various congenital infections and available preventative strategies
 - Recognition of the infections that can be transmitted from mother to baby during the antenatal, perinatal and postnatal period
 - Awareness of the role of risk avoidance, therapeutic interventions, immunisation and Caesarian section in the prevention of congenital infections
- Knowledge of available therapeutic options and preventative measures
 - Liaison between clinicians, laboratory and genito-urinary medicine (GUM) staff including health advisors
- Recognition of the importance of health education, contact tracing and partner notification in reducing the incidence of STIs

SKILLS

- Select, perform and interpret appropriate tests
- Selection of the appropriate antimicrobial in the clinical setting
- Coordinate laboratory testing within screening programmes if indicated

ASSESSMENT & LEARNING METHODS

- Discussions/meetings with infectious disease colleagues
- CBD
- National and international society conferences
- FRCPath

Occupationally Acquired Disease

Objective: Gain working knowledge of occupationally acquired diseases, including, guidelines and standards and having the ability to advice on disease prevention.

KNOWLEDGE

- Basic knowledge of zoonotic infections that may be occupationally acquired
- Knowledge of needlestick incident management and follow-up
- Knowledge of local, national and international guidelines and standards in relation to occupational exposure to infection
- Understand the implications of blood-borne viruses (BBVs) for HCWs
- Understand the role of counselling
- Understand national guidelines

SKILLS

- Be able to advise on needle stick/inoculation incident management and follow-up
- Be able to advise on the prevention of needlestick/inoculation injury

ASSESSMENT & LEARNING METHODS

- Discussions/meetings with infectious disease colleagues
- CBD
- National and international society conferences
- Self directed learning
- FRCPPath

Paediatric & Neonatal Infection

Objective: understanding the specific infection problems related to infection in children including neonates and preventive, diagnostic and therapeutic strategies.

KNOWLEDGE

- Specific infections affecting neonates and the infection control issues which in the NICU
- Pathophysiology, clinical signs and symptoms of infectious diseases in children. Especially those illnesses that are particularly important in or specific to childhood, e.g. neonatal meningitis, group B sepsis, intraventricular shunt infections
- Knowledge of available diagnostic techniques
- Knowledge of the pharmacokinetics of prescribing for children and the need to avoid certain antimicrobials
- Recognition of the need to consider different diagnostic possibilities and treatments in children compared to adults
- Awareness of the need to liaise with paediatric services/general practitioners and to consider the management of infection in the context of the overall welfare of the child

SKILLS

- Consider different diagnostic possibilities in children compared with adults
- Empathise with parents and children
- Work within a multidisciplinary team

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- National and international society conferences
- Self directed learning
- FRCPath

Infection in Pregnancy

Objective: understanding the specific infection problems related to pregnancy including preventive, diagnostic and therapeutic strategies.

KNOWLEDGE

- Effects of pregnancy on the immune system
- Ability to recognise clinical manifestations of physiological immunodeficiency associated with pregnancy
- Infections specific to pregnancy, e.g. septic abortion, chorioamnionitis and endometritis
- Infection considered important in pregnancy, e.g. urinary tract infections in pregnancy, sexually transmitted diseases, fungal infection including candidosis, parasitic diseases, e.g. toxoplasmosis and malaria in pregnancy
- Use of antimicrobials in pregnancy
- Knowledge of the potential teratogenicity when prescribing in pregnancy and the need to avoid certain antimicrobials
- Recognition of the need to consider different therapeutic strategies in pregnant women

SKILLS

- Skills in the diagnosis of these infections
- Competent to select, interpret and perform relevant tests
- Ability to advise on infection in pregnancy

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- National and international society conferences
- Self directed learning
- FRCPath

Specialist Areas of Microbiology

Virology

Objective: Microbiology trainees should normally undertake six months training in a laboratory providing general virology services.

KNOWLEDGE

- Pregnancy and viral infection
- Knowledge of investigation, intervention and advice for women with or in contact with eanthenatous illness/chickenpox in pregnancy.
- Knowledge of natural history of cytomegalovirus rubella, parvovirus B19, measles, enterovirus, hepatitis B, HIV, hepatitis C
 - Aware of rates of abnormality and fetal loss in cases complicated by, in comparison to those not complicated by, viral infection
 - Aware of risk, and absence of evident risk, of viral immunisations
- Investigation, intervention and advice following ascertainment of a healthcare worker with a blood-borne viral infection
 - Aware of relevance of past employment
 - Aware of role and use of prophylactic measures
 - Familiar with practical elements of public notification exercises, helplines and look-back investigation testing
 - Able to act as resource for protocol drafting for helpline staff
 - Capable of managing time in fluid situations
- Knowledge of and competent to select perform and interpret relevant virological tests for:
 - Eye infections
 - Adenovirus
 - Herpes simplex virus
 - Chlamydia infection
 - Infectious mononucleosis
 - Viral Hepatitis:
 - individual and community aspects including intravenous drug users
 - management of acute cases, including appropriate information for the management of contacts, ascertainment of risk factors and notification
 - investigation of individual cases, methods for and significance of virus quantitation
 - investigation of individual cases, importance of travel history
 - Rotavirus - Aware of infection control implications
 - Norovirus - Aware of infection control implications
 - Respiratory infections
 - Enterovirus infection (including poliomyelitis)
 - Hospital and community-acquired including:
 - gastro-enteritis
 - respiratory syncytial virus (RSV), adenovirus
 - influenza
 - individual case investigation
 - importance of notification to local surveillance system and management of hospital-based episodes
 - Rabies - management of potential contact in returned travellers, of bat associated bites and of suspected clinical cases
 - Viral
 - haemorrhagic fevers
 - Dengue - awareness of geographical spread and differential diagnosis
 - Rash illness – non-pregnant
 - Encephalitis and meningitis
 - Herpes simplex –investigation and management
 - Recurrent herpes simplex virus

- Varicella-zoster
 - Chickenpox – management of the acute case in children, management of the acute case in adults, management of the case in pregnant women including obstetric risk factors and counselling, investigation and prevention of secondary cases and infection control in relation to the immunosuppressed, and neonates and the pregnant
 - Zoster – in the normal and the immunocompromised
 - Pregnancy
 - Immunosuppressed
- TSD's including Creutzfeldt-Jakob disease (CJD)/ Variant CJD
- Viral infection of immunocompromised patients including
 - BK virus
 - Cytomegalovirus (CMV)
 - EBV
 - Human herpes virus 6 (HHV-6)
 - Adenovirus
- Tropical virology - Awareness of risks to and prevention advice for travellers, investigations for infection and immediate action for Viral Haemorrhagic Fever (VHF) suspect cases
- Occupational health and viruses
 - Hepatitis B virus
 - Hepatitis C virus
 - HIV
 - Influenza virus
 - Varicella-Zoster virus
 - Herpes simplex virus

SKILLS

- Competent to select, interpret and perform relevant virological tests
- Aware of relevance of past results, and length of time of recommended sample storage
- Able to recognise potential situations where a healthcare worker may have, or have acquired a blood-borne viral infection, which require intervention, whether as a result of an enquiry or upon reviewing results, and constructively support the infection control doctor (ICD) leading the incident, and inform the range of colleagues involved in information acquisition, strategy formation, patient classification investigation and follow-up, healthcare worker diagnosis and management, specimen and specimen collection logistics
- Competent to liaise with reference facilities in investigation, and to advise infection control teams
- Competent to select appropriate tests and to interact with reference laboratories in arranging specimen transport and testing; interpret relevant virological tests
- Competent to liaise with reference facilities in investigation, and to advise infection control teams. Investigation, intervention and advice for women with, or in contact with, rash/illness in pregnancy
- Competent to select perform and interpret relevant virological tests for those infections listed above

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- National and international society conferences
- Self directed learning
- FRCPATH

Health Protection and Epidemiology

Objective: to understand the importance of control of communicable diseases and be able to evaluate effectiveness of services to prevent, diagnose and treat infection.

KNOWLEDGE

- Understand principles and practice of surveillance of infectious disease
- Routine and enhanced surveillance systems
- Understand the role of others in the prevention and control of infection
 - Ability to liaise and communicate with specialists in public health, HPSC
- Understand the general principles involved in immunisation programmes
 - Awareness of methods of vaccine delivery, surveillance of immunisation programmes and evaluation of vaccine efficacy
- Occupational health and travel health procedures
 - Able to give basic health and travel advice and refer to other sources of information and support
- Understand the role and function of reference laboratories
- Use the expertise of reference laboratories to inform local practice
- Understand the importance of new and emerging infectious diseases

SKILLS

- Laboratory reporting and monitoring trends (e.g. in antimicrobial resistance)
- Data handling and interpretation
- Recognition of value and limitations of surveillance systems for community and HCAI
- Recognition of abnormal patterns of infection
- Ability to deal with the unexpected including emerging infectious diseases
- Able to liaise with others to initiate a clinical and managerial response and institute remediation, including defining, establishing and maintaining the appropriate levels of laboratory security to ensure due diligence in the prevention of criminal misuse of organisms
- Awareness of the need for timely referral of material to reference laboratories

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- National and international society conferences
- Self directed learning
- FRCPATH

Mycology

Objective: understanding of superficial and deep infection caused by yeasts and moulds including diagnostic, therapeutic and preventative strategies.

KNOWLEDGE

- Superficial fungal infection
- Systemic fungal infection
- Understanding of appropriate antifungal prevention and treatment strategies
- Understanding of the methods available for susceptibility testing and their limitations
- Understanding of diagnostic methods including serology and molecular testing

SKILLS

- Recognise clinical features of superficial and systemic fungal infection
- Understand how to examine skin, hair, nails and other relevant samples for presence of fungal elements
- Understand how to identify yeast, dermatophyte fungi and other common moulds from clinical material
- Recommend appropriate treatment
- Identification of patients at risk of systemic infection
- Request appropriate specimens for diagnosis including appropriate serological and molecular test as available
- Recognise when susceptibility testing is required

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- National and international society conferences
- Self directed learning
- FRCPATH

Parasitology

Objective: to acquire skills and knowledge in examinations of blood, stool and other tissues for the presence of parasites and to be able to identify major parasitic species, to be able to recommend appropriate investigation and treatment.

KNOWLEDGE

- Imported parasitic infections with an emphasis on the infections common in European practice
- Endemic parasitic infections
- Parasitic infections associated with severely immunocompromised patients
- Understand the methods to measure parasite size under the microscope
- Understand the appropriate use of serological and molecular diagnostics for parasitic infections
- Understand the appropriate use of reference facilities
- Epidemiology of parasitic infections understanding the conditions under which infections are transmitted so that the risk of infection to patients can be assessed
- Use of antiparasitic drugs
- Detailed understanding of the diagnosis and management of *Toxoplasma gondii* and other significant parasitic infections in the context of pregnancy

SKILLS

- Basic skills in examination of blood, stool, and other tissues for the presence of protozoa and helminths
- Identify major parasitic species
- Perform methods to estimate malaria parasite numbers
- Recommend appropriate treatment
- Plan an appropriate investigation scheme for individuals at risk of tropical infection

ASSESSMENT & LEARNING METHODS

- Study Day
- CBD
- National and international society conferences
- Self directed learning
- FRCPATH
- Practical Skills course in Parasitology (optional)

Communication and Management Issues in Microbiology

Objectives: to develop necessary management, communication and leadership skills to take administrative responsibility for a laboratory and deliver a high-quality clinical service.

KNOWLEDGE

- Laboratory management
 - Awareness of organisation and structure of a microbiology/virology laboratory including:
 - staffing and financial issues
 - planning
 - implementation of policies and rotas.
 - Concepts of good laboratory practice
 - Understand the process of management and being managed
- Laboratory accreditation and the role of accreditation bodies such as INAB
- Understand the criteria for accreditation
 - Able to implement these criteria
- Appraisal
 - Constructive listening, mentoring, appraisal skills.
- Clinical audit - Ability to audit and evaluate:
 - personal and departmental activities
 - existing and new tests, techniques and services
- Delivery of service
 - Able to present microbiological and virological data to clinicians and other healthcare workers in an effective manner
- Standards of professional practice and clinical governance
 - Understand importance of clinical governance and delivery of high-quality standards in microbiology and virology
 - Understand concept of clinical risk management and procedures designed to minimise risks
 - Understand importance of patient consent to use data or specimens for ethically approved research or teaching
- Up to date knowledge of the organisation of HSE, HIQA and allied organisations
- Understanding of role of HPA and HPSC
 - Awareness of healthcare structures (including primary care teams).
- Knowledge of teaching methods, assistance and resources available
 - Good presentation skills, good public speaking and organisation
- Information technology:
 - working knowledge of laboratory data entry and retrieval and surveillance systems
 - understanding of aspects of the Data Protection Act relevant to laboratory and clinical practice
- Apply the principles of confidentiality and their implementation in terms of clinical practice

SKILLS

- Ability to search electronic databases and use the Internet as a learning and communication resource.
- Demonstrate basic use of database, word processing and statistics programmes.
- To develop and manage a microbiology laboratory
- Develop a business plan for a new service
- Implement accreditation
- Carry out appraisal
- Carry out Audit

ASSESSMENT & LEARNING METHODS

- HST Leadership for Pathology
- FRCPATH
- Participation in vertical and horizontal audits in the laboratory whenever possible

Documentation of Minimum Requirements for Training

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

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Section 1 - Training Plan				
Personal Goals Plan (Copy of agreed Training Plan for your current training year signed by both Trainee & Trainer)	Required	1	Training Post	Personal Goals Form
Section 2 - Training Activities				
Ward Rounds (One entry per week on average)	Required	40	Year of Training	Clinical Activities
Liaison with other specialties (Record one entry per week on average)	Required	40	Year of Training	Clinical and Other Liaisons
Attendance at AMS Committee meetings	Required	1	Training Programme	
Participation in AMS rounds, both ward/specialty focused and directed at patients on formulary non-compliant antimicrobials	Required	1	Year of Training	
Participation in audit of antimicrobial use	Required	1	Year of Training	
Participation in antimicrobial consumption surveillance	Required	1	Training Programme	
Participation in antimicrobial formulary review	Desirable	1	Training Programme	
Participation in MDT	Required	1	Training Programme	
Procedures/Practical Laboratory Bench Skills (min 90 minute sessions)	Required	10	Year of Training	Procedures, Skills, & DOPS
Sample preparation	Required	1	Year of Training	
Microscopy (light/electron)	Required	1	Year of Training	
Culture (bacteria, fungi, mycobacteria) and reading of plates	Required	1	Year of Training	
Identification	Required	1	Year of Training	
Antimicrobial susceptibility testing	Required	1	Year of Training	
Nucleic acid detection	Required	1	Year of Training	

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Serological testing	Desirable	1	Year of Training	
Other	Required	1	Year of Training	
Laboratory experience other than Bench Skills (Minimum of 2 entry per week, totaling 40 from the list below) Please do not include any patient identification in case discussion.	Required	40	Year of Training	Laboratory Activities
Interpreting/reporting preliminary results e.g. Gram stain/culture/serology/susceptibility/Other results	Required	1	Year of Training	
Interpreting/reporting/authorising final results e.g. Gram stain/culture/serology/susceptibility/other results, including both the infection control and the AMS utility of the report	Required	1	Year of Training	
Safe disposal of waste (containment/disinfection/disposal)	Required	1	Year of Training	
Health and safety policy and practice	Required	1	Year of Training	
Laboratory application of information technology	Required	1	Year of Training	
Management Experience				Management Experience
Workload management	Required	1	Year of Training	
Laboratory accreditation	Required	1	Year of Training	
Complaints	Required	1	Training Post	
Recruitment	Desirable	1	Training Programme	
Systems (Root Cause) Analysis	Required	1	Training Programme	
Details of cases/clinical experience/specialised rounds (2 cases per week, please select from the relevant category for this form. Use one form per category. When possible, see the patient and discuss with trainer).	Required	80	Year of Training	Cases
Medical	Required	1	Year of Training	Cases
Surgical	Required	1	Year of Training	
Haematology	Required	1	Year of Training	
Oncology	Required	1	Year of Training	
Obstetrics	Required	1	Year of Training	
General Practice	Required	1	Year of Training	
Public Health	Required	1	Year of Training	
Food and water microbiology	Desirable	1	Year of Training	

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Paediatrics	Required	1	Year of Training	
Relatively Unusual Cases 1 per month on average	Required	10	Year of Training	Cases
Records of on-call for pathology (Record work outside of normal working hours, Monday to Friday). Briefly document the nature of the commitment (on-site or off-site, immediate consultant support or telephone support) and the experience gained.	Desirable	1	Year of Training	Clinical Activities
Record Guidelines/Policies - A SpR should be involved in a minimum of 1 policy or guideline per year (A SpR can explore an existing policy to fulfil this requirement). In later stages of training, trainees are encouraged to lead on document development with appropriate support. A record of contribution to review or development of guideline or policy documents e.g. antimicrobial use, infection control.	Required	1	Year of Training	Policies and Guidelines
Infection Control (Record a minimum of 1 entry per category per month and cover a broad range of activities over the period of your training, 10 in total from the list below)	Required	10	Year of Training	Policies and Guidelines
Outbreaks	Required	1	Year of Training	
Hospital building	Required	1	Year of Training	
Sterilisation	Required	1	Year of Training	
Disinfection	Required	1	Year of Training	
Environmental issues	Required	1	Year of Training	
Inoculation injury	Required	1	Year of Training	
Infection control meetings	Required	4	Year of Training	
Surveillance activities	Required	1	Year of Training	
Other	Required	1	Year of Training	
Record of Off-site Activities (In general record 1 episode per week – it is accepted that in general this engagement will be by telephone but opportunities to participate in person are encouraged. Aim to cover as broad a range of activities as possible)	Required	40	Year of Training	Clinical and Other Liaisons
Engagement with GPs	Required	1	Year of Training	
Engagement with Public Health/HPSC	Required	1	Year of Training	
Engagement with EHOs	Desirable	1	Training Programme	
Other	Required	1	Year of Training	

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Section 3 - Educational Activities				
Mandatory Courses				Teaching Attendance
Ethics Foundation	Required	1	Training Programme	
Ethics for Pathology	Required	1	Training Programme	
An Introduction to Health Research Methods	Required	1	Training Programme	
HST Leadership for Pathology (Year 3+)	Required	1	Training Programme	
Mastering Communication (Year I)	Required	1	Training Programme	
Performing Audit (Year I)	Required	1	Training Programme	
Core Pathology I	Required	1	Training Programme	
Core Pathology II	Required	1	Training Programme	
Core Pathology III	Required	1	Training Programme	
Wellness Matters	Required	1	Training Programme	
Study days (Minimum of 4 study days per year)	Required	4	Year of Training	Teaching Attendance
Attendance at In-house activities	Required	10	Year of Training	Attendance at Hospital Based Learning
Examinations				Examinations
FRCPath Examinations	Required	1	Training Programme	
Delivery of Teaching	Required	3	Year of training	Delivery of Teaching
Research (Minimum of 2 research projects during training - not inclusive of a year out for research – note projects may be modest in scope)	Required	2	Training Programme	Research Activities
Audit activities and Reporting (1 per year either to start or complete, Quality Improvement (QI) projects can be uploaded against audit)	Required	1	Year of Training	Audit & QI
Publications (Minimum of 1 paper submitted for publication to a peer reviewed journal during the training period)	Required	1	Training Programme	Additional Professional Experience
Presentations	Required	4	Training Programme	Additional Professional Experience
National/International meetings (minimum of 4 national or international meetings over the training period)	Required	4	Training Programme	Additional Professional Experience

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Additional Qualifications	Desirable	1	Training Programme	Additional Professional Experience
Committee Attendance (Sit on least an Infection control committee and a laboratory management committee – record minimum of 1 per year of training particularly for years 3, 4 and 5)	Required	1	Year of Training	Additional Professional Experience
Section 4 - Work Place Based Assessments				
DOPS				Procedures, Skills, & DOPS
Microscopy	Required	1	Training Programme	
Direct microscopy on CSG	Required	1	Training Programme	
Culture a clinical sample	Required	1	Training Programme	
Anti-microbial susceptibility testing	Required	1	Training Programme	
CBD (one per year from the following list) Infection control risk assessment Infection in the community Health care associated infection and infection prevention and control Infection in critical care sepsis Management of an outbreak infection Virology	Required	1	Year of Training	Case Based Discussion
Mini-CEX (At least two Mini-CEX assessments should take place in each year of training on average - one Mini CEX related to infection control and one clinical / patient-centred Mini-CEX per year)	Required	2	Year of Training	Mini CEX
Quarterly Assessments/End-of-Post Assessments	Required	3	Year of Training	Quarterly Assessments/End-of-Post Assessments
End of Year Evaluation	Required	1	Year of Training	End of Year Evaluation