



FACULTY OF PATHOLOGY  
ROYAL COLLEGE OF PHYSICIANS OF IRELAND

# HIGHER SPECIALIST TRAINING IN CLINICAL MICROBIOLOGY



**This curriculum of training in Clinical Microbiology was developed in 2010 and undergoes an annual review by Prof. Martin Cormican, National Specialty Director and Dr Ann Gilleece, National Speciality Director, Dr. Ann O'Shaughnessy, Head of Education and Professional Development and by the Clinical Microbiology Specialty Training Committee. The curriculum was 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.

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** describes the knowledge, skills, attitudes and behaviours expected by patients and society from individuals during the practice of their profession (*as a doctor*). It includes such concepts as:

- The skills of lifelong learning and the maintenance of competence
- Information literacy
- Ethical behaviour
- Integrity, honesty
- Altruism
- Service to, justice and respect for others
- Adherence to professional codes

## Entry Requirements

Applicants for Higher Specialist Training (HST) in Clinical Microbiology must have completed a **minimum** of two years Basic Specialist Training (BST) in approved posts and obtained the MRCPI or UK.

BST\* should consist of a minimum of 24 months involved with direct patient care.

### **BST in General Internal Medicine (GIM) is defined as follows:**

- A minimum of 24 months in approved posts, with direct involvement in patient care and offering a wide range of experience in a variety of specialties.
- At least 12 of these 18 months must be spent on a service or services in which the emergencies are “unselected”.
- For further information please review the BST curriculum

Those who do not hold an MRCPI/MRCPUK must provide evidence of equivalence.

Those without actual experience in Clinical Microbiology should be able to demonstrate their interest in, and a commitment to the Specialty (for example) through (ideally inclusion of) a period of not less than six months experience in one or more relevant specialty(s) such as Infectious (Communicable) Diseases; Genito-Urinary Medicine (including HIV); Paediatrics; Oncology; Transplantation Medicine; Chest Medicine.

### **Evidence of substantial academic or professional achievement includes:**

1. Those who have undertaken their BST in Medicine and related Specialties should have acquired MRCPI, MRCPUK or equivalent.
2. Those who have undertaken their BST in another discipline should have evidence of significant post-graduate achievement such as AFRCSI, MRCOG etc.
3. Those applicants who do not fit the above two categories must have evidence of substantial academic achievement i.e. PhD or MD.

## 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 1 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. A minimum of 6 months training in Virology is required as part of the HMT programme in Clinical Microbiology.

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

### **Minimum Procedures:**

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. 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 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.

## Flexible Training

Trainees who are unable to work full-time are entitled to opt for flexible training programmes. EC Directive 93/16/EEC requires that:

*Part-time training shall meet the same requirements as full-time training, from which it will differ only in the possibility of limited participation in medical activities to a period of at least half of that provided for full-time trainees;*

*The competent authorities shall ensure that the total duration and quality of part-time training of specialists are not less than that of full-time trainees.*

The above provision must be adhered to. A flexible trainee should undertake a *pro rata* share of the out-of-hours duties (*including on-call and other out of hours commitments*) required of their full-time colleagues in the same programme and at an equivalent stage.

For details of appointment and funding arrangements for flexible trainees, please see the current issue of the HST training Handbook.

## Training Programme

The training programme offered will provide opportunities to fulfil all the requirements of the curriculum of training for Clinical Microbiology programmes will offer posts in both general hospitals and teaching 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 or, in the case of GIM, the Regional Specialty Advisor. 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.

## Teaching, Research & Audit

All trainees are required to participate in teaching. They should also receive basic training in research methods, including statistics, so as to be capable of critically evaluating published work.

A period of supervised research relevant to Clinical Microbiology is considered highly desirable and will contribute up to 12 months towards the completion of training. Some trainees may wish to spend two or three years in research leading to a MSc, MD, or PhD, by stepping aside from the programme for a time.

Additional educational credit may be granted at the discretion of the NSD and STC for clinical work relevant to the Curriculum undertaken during the second and subsequent years of this research, up to a maximum of six months credit. For those intending to pursue an academic path, an extended period of research may be necessary in order to explore a topic fully or to take up an opportunity of developing the basis of a future career. Such extended research may continue after the CSCST is gained. However, those who wish to engage in clinical medical practice must be aware of the need to maintain their clinical skills during any prolonged period concentrated on a research topic, if the need to re-skill is to be avoided.

Trainees are required to engage in audit during training and to provide evidence of having completed the process.

## Logbook

Up-to-date training records and a portfolio of achievements will be maintained by the trainee throughout HST. The training records will be countersigned as appropriate by the trainers to confirm the satisfactory fulfilment of the required training experience and the acquisition of the competencies set out in the Clinical Microbiology Curriculum. They will remain the property of the trainee and must be produced at the annual assessment review.

Each trainee is responsible for maintaining an up-to-date record of progress through training and compiling a portfolio of achievements for presentation at annual assessment review. The trainee also has a duty to maximise opportunities to learn, supplementing the training offered with additional self-directed learning in order to fulfil all the educational goals of the curriculum. Trainees must co-operate with other stakeholders in the training process. It is in a SpR's own interest to maintain contact with the Medical Training Office and Dean of Higher Specialist Training, and to respond promptly to all correspondence relating to training. "Failure to co-operate" will be regarded as, in effect, withdrawal from the HST's supervision of training (see *the HST Training Handbook*).

At annual review, the Training Record will be examined. The results of any assessments and reports by educational supervisors, filed in the portfolio submitted, together with other material capable of confirming the trainee's achievements, will be reviewed.

## Assessment Process

The methods used to assess progress through training must be valid and reliable. The Clinical Microbiology 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 annual review. 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.

## Annual Review – The PeTRA Process

An annual review of progress through training will be undertaken on behalf of HST. The training record will be examined at the review. Assessments and reports by educational supervisors, confirmation of achievements and the contents of the logbook will be reviewed. A decision is made regarding progress, as detailed in the Training Handbook. At some or all of the annual reviews a non-specialty assessor will be present capable of addressing core competencies. An external assessor will participate in the penultimate year review (PYA) which is held to a standard format usually 12-18 months before the planned end of training. The award of a CSCST will be determined by a satisfactory outcome after completion of the entire series of PeTRA assessments.

Each year trainees undergo a formal review by a panel including the Dean, or Dean's representative, the National Specialty Director, and whenever possible, a representative member from another specialty. The panel will review in detail the training record, will explore with the trainee the range of experience and depth of understanding which has been achieved and consider individual trainer's reports. Attendance by the trainer is highly desirable and essential for the first year and PYA assessments. An opportunity is also given to the trainee to comment on the training being provided; identifying in confidence any deficiencies in relation to a particular post.

A decision on progress through training is reached at each of these annual assessments. The determination and the evidence considered is entered on one of a set of standard PeTRA Forms as follows:

- successful completion of a year of training – **PeTRA Form C**
- completion but with a need for additional targeted training – **PeTRA Form C<sub>1</sub>**
- repeat training year – **PeTRA Form C<sub>2</sub>**

The penultimate year assessment (*the PYA*) reviews the evidence provided in the logbook on the results of the assessment methods employed (*see above*); the evidence provided will be further questioned during the assessment. At the PYA, the panel identifies the residual training outstanding, advising adjustments to the training schedule as necessary, and finally confirming the estimated date for completion (**PeTRA Form T and CSCST issuance**).

## Facilities

A consultant trainer/educational supervisor has been identified for each approved post. He/she will be responsible for ensuring that the educational potential of the post is translated into effective training which is being fully utilized. The training objectives to be secured should be agreed between trainee and trainer at the commencement of each posting in the form of a written training plan. The trainer will be available throughout, as necessary, to supervise the training process.

All training locations approved for HST have been inspected by the Medical Training department. Each must provide an intellectual environment and a range of clinical and practical facilities sufficient to enable the knowledge, skills, clinical judgement and attitudes essential to the practice of Clinical Microbiology to be acquired.

Physical facilities include the provision of sufficient space and opportunities for practical and theoretical study; access to professional literature and information technologies so that self-learning is encouraged and data and current information can be obtained to improve patient management.

Trainees in Clinical Microbiology should have access to an educational programme of e.g. lectures, demonstrations, literature reviews, multidisciplinary case conferences, seminars, study days etc, capable of covering the theoretical and scientific background to the specialty. Trainees should be notified in advance of dates so that they can arrange for their release. For each post, at inspection, the availability of an additional limited amount of study leave for any legitimate educational purpose has been confirmed. Applications, supported if necessary by a statement from the consultant trainer, will be processed by the relevant employer.

**Teaching, Learning & Assessment  
Methods**

## Teaching, Learning & Assessment Methods

*This section relates to the clinical competencies that are required for your training. During your training you will be assessed by methods such as MiniCEX, DOPS and Case Based Discussion. It is extremely important that you read this so that you are aware of the requirements of your training.*

### Record of Training

The evidence required to confirm progress through training includes:

- Details of the post(s) occupied, the training plan agreed with weekly timetables and duty rosters; case-mixes and volumes, numbers of practical procedures and outcomes.
- Confirmation of attendance at events in the educational programme, at departmental and inter-departmental meetings and other (optional) educational events.
- Confirmation (certificates) of attendance at subject-based/skills-training/instructional courses; (certificate or diploma from appropriate authority).
- Recorded attendance at conferences and meetings.
- A properly completed logbook with entries capable of testifying to the training objectives which have been attained and the standard of performance achieved.
- Evidence of regular contact with trainers, i.e. appraisals; confirmation of workplace/clinical encounters significant in relation to activities specified in the curriculum.
- Evidence of personal study, e.g. journals taken, membership of specialist society, web-based research and special interest developed.
- CPD/CME activity, returns, study leave records.
- Copies/examples of material prepared for presentation e.g. for audit, teaching, best-practice development, collection of cases, topic reviews, output from research.
- Educational supervisor's reports on **observed** performance (in the workplace): of duties, practical procedures, of presentations made and teaching activity: of advising and working with others, of standards of case notes, correspondence, communication with others e.g. at handover. Results of Mini-CEX, CBDs and DOPS encounters.
- Collective opinions as used to ascertain a range of generic skills e.g. professionalism, maintaining trust.
- Result (diploma, certificate from recognised body) of completed knowledge-based test and/or practical examination.

### Assessment of Competencies

The competencies to be acquired during training are listed within the Generic and Specialty Sections of this Curriculum.

The competencies will be assessed on a regular basis during your training programme and must be documented in the Training Record (*Logbook*). Progress through training is confirmed by entries which must be authenticated/ countersigned by the educational supervisors.

Documents which provide evidence of satisfactory completion of other necessary components of the curriculum must be filed in the portfolio of achievements compiled by the trainee and reviewed annually.

A report from the educational supervisor will be included. This will be prepared following appraisal, based on his/her assessment of observed performances by the trainee of practical procedures and other duties. The standard of case notes, summaries, correspondence and other material, of presentational ability can also be the subjects of such report, as could the trainee's enthusiasm, judgement, team working or professionalism.

The trainer's report will also be based on a structured pro-forma, as used in the short form of clinical evaluation exercise (*Mini-CEx*); following observation and appraisal of the performance of a procedure (*DOPS*); after discussion of the (*clinical*) reasoning involved in the management of a problem faced by a trainee (*Case-Based Discussion, CBD*).

The results of any summative tests of knowledge taken, e.g. *MCQs and problem-solving tests, including self-administered tests*, should be filed and retained. Confirmation of the acquisition at a particular stage of a specified professional examination may be required in order to make progress towards the completion of training.

## **Learning Methods**

This section gives examples of the learning methods that can be used as guidance to acquire competencies as they appear in the curriculum.

### **Experiential:**

- Working under supervision
- Documenting/reporting progress (*case notes*), preparing summaries (*discharge notes*) other professional correspondence; communicating information to patients/to other health professionals.
- Consults, referrals between departments, handover, providing cross-cover.
- (*In certain specialties*), procedure room and investigation/assessment sessions offer practical opportunities to learn and develop skills under supervision and to exercise judgement when to seek assistance.

### **Self-directed learning:**

- Curriculum-based personal study e.g. *textbooks, journals, literature search, retrieval of web-based information*.
- Information gathering and evaluation
- Active participation in audit
- Tests of knowledge

### **Group learning:**

- Workplace discussions
- Multidisciplinary meetings
- Programmed meetings within the workplace

### **Performance based:**

- Observing, learning, assisting, performing, demonstrating a technique or practical procedure.
- Simulations, role-play

### **Learning through teaching and research:**

- Teaching, giving tutorials, lecturing.
- Mentoring and supervising junior colleagues and other staff.
- Presenting at meetings - local and international.
- Research
- Publication

### **External Courses:**

- Specialty study/training days
- Attending mandatory and non-mandatory courses
- Attendance at seminars, relevant conferences, regional, national and international meetings.

**Reflection:**

- In your logbook there is an area to record reflections on training, learning, clinical events and career discussions. In recent years the importance of reflecting as part of the learning process on what you are doing has been shown to improve professional practice. Reflection on what you know and don't know helps to understand that learning is individual and reflection of professional activities can be used to highlight your strengths, weaknesses and areas for development.

## Assessment Methods

### Mini-CEx

**Definition:** Mini-CEx is designed to provide feedback on skills essential to the provision of good clinical care by observing an actual clinical encounter.

**Description:** The mini-CEx is a “snapshot” of a doctor/patient interaction and is based on a 15 minute observation of a single interaction. It is designed to assess the clinical skills and behaviors of trainees assessing such skills as history taking, physical examination skills, clinical judgement, professionalism, organisation/efficiency and overall clinical care. Not all elements will be assessed on each occasion. Immediate feedback should be provided after each encounter by the observer assessing the trainee.

**Frequency of assessment:** At least two miniCEx assessments should take place in each year of training. Where appropriated, one should be based in an outpatient setting and one in an acute setting. The assessments include assessment of skills in history taking, physical examination, appropriate use of investigations, cost-effectiveness, interpretation of investigations, making medical notes, making a diagnosis, treatment and management of disease, appropriate referral to other specialities, standards of care.

#### Competencies assessed:

- Consideration/Professionalism:
- Recognises/accepts patient’s rights (to consent, confidentiality, information). Establishes trust, shows professional approach.
- Communication:
  - Informs, explains, advises using appropriate language. Obtains consent, enlists patient’s co-operation.
- Interviewing Skills:
  - “Active” listening facilitating relevance; effectively using questions, responding to non-verbal clues.
- Examination Skills:
  - Prepares patient, minimises discomfort/unease. Proceeds logically, efficiently, thoroughly, completely.
- Judgement:
- Correctly identifies/lists problems, prioritises actions in realistic and timely schedule.

**Opportunities for assessment:** The assessment should take place in the usual place of work (*in-patient, clinic, office, infection control based or department*) where the assessor must directly **observe** the trainee’s performance.

### DOPS:

**Definition:** Directly Observed Procedural Skills (DOPS) is a method, similar to the mini-CEx that has been designed specifically for the assessment of practical skills. DOPS assess the capabilities of a trainee while they perform a procedure.

**Description:** The DOPS is a structured assessment of actual performance. Each DOPS should represent a different procedure. The trainee chooses the timing, procedure and observer.

**Frequency of Assessments:** The number and frequency of assessments of procedural skills will vary from specialty to specialty.

**Competencies assessed:**

- Understanding of Procedure:
  - Relevant anatomy; purpose, indications, contra-indications; outcomes, risks, complications; choice of methods available, technique of procedure.
- Consideration for the Patient:
  - Gives reassurance, minimises discomfort, explains procedure fully; confirms informed consent obtained.
- Preparation:
  - First re-checks all relevant details correct. Safety check; instrumentation, equipment (drugs); positioning; cleansing/aseptic technique; sedation, analgesia, anaesthesia confirmed.
- Professional/technical ability:
  - Dexterity, accuracy, efficiency; obtains, interprets diagnostic material/information; informs, directs staff courteously; recognises own limitations; seeks help where appropriate; manages risk.
- Post-Procedure:
  - Completes documentation; regulates recovery phase, observations; anticipates/deals with complications. Informs/counsels patient/relatives.
- Overall ability to perform Procedure:
  - Ability to complete/undertake procedure; technical abilities as demonstrated; appropriately confident, team/ leadership skills.

**Opportunities for assessment:** While supervising, assisting, observing actual performance in appropriate setting (office, theatre, day procedure, ICU etc.). The assessment should be made under appropriate conditions e.g. with all equipment and personnel necessary to support the procedure.

**Case Based Discussion (CBD)**

**Definition:** Case-based discussion (CBD) is used to enable the documenting of conversations about, and presentations of, cases by trainees. This activity happens throughout training, but is rarely conducted in a way that provides systematic assessment and structured feedback. CBD is used to evaluate core skills that can be demonstrated during an interactive discussion based on a single case in which the trainee has been actively involved.

**Description:** CBD is designed to assess clinical decision-making and the application or use of medical knowledge in relation to patient care for which the trainee has been directly responsible. It also enables the discussion of the ethical and legal framework of practice, and in all instances, it allows trainees to discuss why they acted as they did. Although the primary purpose is not to assess medical record keeping, as the actual record is the focus for the discussion, the assessor can also evaluate the record keeping in that instance. The case for discussion can either be selected by the trainee or chosen by the assessor. The assessment will be based on oral discussion and written information available. It includes a bi-lateral (trainee's and trainer's) critical appraisal of the reasoning and judgements made, and of the management of the case. Whenever possible the assessment should include issues such as disease notification, health promotion and screening.

**Frequency of Assessment:** This method of assessment has not been validated as yet, however it is a very useful method and can be easily incorporated into journal clubs, post-graduate teaching sessions or on-line etc

**Competencies assessed:**

- **Problem Definition:**
  - All relevant facts established, from current/previous history, investigations, interventions; reports, correspondence reviewed.
- **Record Keeping:**
  - Legible, tidy, legally defensible records seen.

- **Reasoning:**
  - Appropriately selected, sequenced investigations/procedures planned. Evidence-based, logical judgements made; (differential) diagnosis established; action plan made with realistic goals.
- **Case Management:**
  - Effective, safe (responsible) prescribing; aware of protocols/guidelines, best practice; monitoring progress, handling complications/mistakes; timely, appropriate referrals, case closure.
- **Reflective Practice:**
  - Shows analytical, constructive approach to case, willingness to learn; acknowledges and prepared to consider other management options; aware of change, possible advances, when to seek help.

**Opportunities for assessment:** The presentation should take place in a suitable environment, with due consideration given to the patient's sensitivities, to confidentiality e.g. in any ward or clinical setting; an office, side- or seminar-room may be found convenient. Case presentations and discussions, e.g. at handover, ward-rounds (inter-) departmental meeting.

## **Mandatory Training Courses**

*(Note: this list only included the generic mandatory courses)*

### **Mandatory Communication course:**

To be completed in Year 1. The course is a short 1 -2 hour course at the start or the end of specialty study days to reduce time spent away from the hospitals.

Communication skills will be assessed as part of the miniCEX assessments

### **Audit:**

Mandatory 1/2 day on audit to be completed in Year 1.

Audit reports are submitted on a yearly basis

### **Ethics:**

Four mandatory study days are to be completed during the training programme. Three study days are for all specialities - Ethics & Law, Ethics in Research and Professionalism. The fourth day 'End of life' is for all specialties except Public Health Medicine, Occupational Medicine and Pathology who have a speciality specific ethics day.

### **Leadership Skills:**

Mandatory 3 day course to be taken in year 3 – 5

### **ACLS:**

ACLS compliant in appropriate specialties

## **Specialty Study Days**

The topics of specialty specific study days to be completed during training are listed in Appendix 2.

## **Annual Assessments**

### **Consultant feedback:**

End of year assessment completed by the Trainers include assessment in areas such as:

Team working skills, Leadership skills, Handling of complaints, conflict management

Questions such as the following are included in the assessment form:

- Have there been any complaints from nursing staff, AHP, patients regarding this trainee or their team?
- If so:
  - How did the trainee respond to a complaint about a member of his/her team?
  - How did the trainee respond to a complaint against him/her?.
- Have you any serious issue with your SpR?
- Where there any instances of serious conflict?
- Do you think he/she behaved appropriately?

### **Audit:**

It is difficult to complete the audit cycle in a one year period. Each year the trainee should take part in an audit - either to develop and start an audit or to review and change practice as a result of an audit - the complete audit cycle should be understood. In hospitals that have audit systems set up, the trainee should complete a full audit.

Trainees will be required to submit a full audit report and will be encouraged to present audit results at local, national or international meetings.

**Attendance at In- Hospital Speciality Radiology conferences**

**Time spent in Laboratory/Pathology or attendance at Laboratory/Pathology conferences** (Depending on specialty)

**Committee membership:**

Many specialty curricula have identified participation in committees.

**Teaching skills**

Number of undergraduate and postgraduate tutorials, number of membership tutorials.

**Presentations/Publications**

**On-Call take**

## **GENERIC COMPONENTS**

# Communication & Interpersonal Skills

**Objective:** To be able to communicate effectively and sensitively with patients, their relatives, carers and with professional colleagues in different situations.

**Medical Council Domains of Good Professional Practice:** No. 2: Relating to Patients; No 3. Communication and Interpersonal Skills.

## KNOWLEDGE

### Within a consultation

- How to structure an interview to obtain/convey information; how to identify concerns, expectations, priorities; how to promote understanding, reach conclusions; use/choose appropriate language. Knowledge of procedures/investigations available and alternative options; of strategies to promote compliance through understanding of objectives.
- Able to elicit facts, question using open, followed by closed questions; “active listening”. Gives information clearly, avoids jargon, confirms understanding, is able to encourage co-operation, compliance; obtain informed consent.
- Considerate, shows respect for other’s culture, opinions, patient’s right to be informed, make choices.

### In difficult circumstances

- Understands potential areas for difficulty “awkward situations”, knows how and when to break bad news, how to circumvent cultural, language barriers, deal with sensory or mental impairments, how to deal with challenging or aggressive behaviour.
- Able to communicate essential information where difficulties exist, appropriately uses assistant, interpreter, chaperone, relatives. Able to deal with anger, frustration in self and others.
- Selects an appropriate environment; seeks assistance, makes and takes time. Avoids unrealistic optimism or pessimism.
- Respects another’s right to opinions and to accept or reject advice.

### With professional colleagues and others

- How best and when to communicate with doctors and other members of the healthcare team; how to provide concise, problem-orientated statement of facts and opinions (*written, verbal or electronic*). Knows legal context status of records and reports, of data protection (*confidentiality*), Freedom of Information (FOI) issues.
- Understands relevance to continuity of care and the importance of legible, accessible, authenticated records. Knows when urgent contact becomes necessary and the appropriate place for verbal, telephone, electronic, written communication.
- Communicates effectively, promptly; recognises roles and skills of other health professionals.
- Able to judge own abilities/limitations and when to seek help or give assistance, advice to others; when to delegate responsibility, when to refer.
- Values perspectives of others contributing to management decisions.

### In maintaining continuity of care

- Understands the relevance to outcome of continuity of care, within and between phases of healthcare management.
- The importance of completion of tasks and documentation *e.g. before handover (to another team, department, specialty)*, of identifying outstanding issues, uncertainties.
- Maintains (*legible*) records, is available, contactable, time-conscious, sets (*and attempts to reach*) realistic objectives, identifies/prioritises outstanding problems.
- Alert to avoid potential confusion or misunderstanding through communications failure.

### **Giving explanations**

- The importance of possessing the full facts, and of recognising uncertainty and conflicting evidence on which decisions have to be based.
- How to secure, retain attention avoid distraction. Understand how adults receive information best, the relative value of the spoken, written, visual means of communication, use of reinforcement to assist retention. Risk of information overload.
- Need to interpret results, significance of findings, diagnosis, to explain objectives, limitations, risks of treatment, in terms and by means adjusted to recipients' ability to comprehend.
- Uses language, literature (*leaflets*) diagrams, educational aids and resources appropriately.
- Able to achieve level of understanding necessary to achieve co-operation (*compliance, informed choice, acceptance of opinion, advice, recommendation*).
- Prepared to discuss, repeat information, resolve uncertainty, confusion, respond to questioning, challenge.

### **Responding to complaints**

- Value of hearing and dealing with complaints promptly; the appropriate level, the procedures (*departmental and institutional*); sources of advice, assistance available.
- The importance of obtaining and recording accurate and full information, seeking confirmation from multiple sources.
- Able to establish facts, identify issues and respond quickly and appropriately to a complaint received.
- Accepts responsibility, involves others, consults appropriately.
- Open, prepared to accept criticism, acknowledge shortcomings where they exist, offer an apology.

## **SKILLS**

- Communication
- Conflict resolution
- Dealing with complaints
- Communicate decisions in a clear and thoughtful manner
- Presentation skills

## **ASSESSMENT & LEARNING METHODS**

- 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

## Professionalism & Autonomy

**Objective:** *To have the knowledge, skills and attitudes to act in a professional manner at all times and in partnership with patients and colleagues. To develop the attributes of someone trusted to be able to manage complex human, legal and ethical problems.*

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care; No 2. Relating to Patients; No. 7 Professionalism

### KNOWLEDGE

#### Patient Centred Care;

- The provision of Patient Centre Care should be at the core of the service a doctor provides
- To put the quality and safety of patient care as a prime objective

#### Behaviour in the workplace;

- **Relationships with patients**
  - Know patients' rights e.g. to be informed sufficiently to enable them to be involved in decisions about their treatment and care. Know boundaries limiting consultations including ethical, duty of care.
  - How to deal with inappropriate behaviour e.g. *aggression, threats, violence, harassment, racism.*
  - Potential obstacles e.g. *cultural, educational, ethical – also preconceptions and prejudices.*
  - Ensures confidentiality, respects privacy. Focuses investigation on patient's needs and expectations. Shows sensitivity, develops empathy but avoids personal involvement.
  - Non-judgemental in approaching patient's perceived problems. Prepared to accommodate idiosyncrasies, respecting patients as individuals. Altruistic.
- **Working with colleagues**
  - Know the potential roles and contributions of other specialists – medical, surgical, general practitioners and of other hospital or community-based agencies e.g. *social services, also patient support groups and other providers of care.*
  - How to arrange cover, safeguarding the handover process, know where responsibility begins and ends, when and where to seek advice.
  - Aware of the extent and limitations of own areas of practice/expertise; recognises and respects others' inputs, capabilities; is able to work co-operatively with other health professionals; refers, delegates appropriately.
  - Realistically schedules and completes tasks and provides full documentation for handover, referral; strives to maintain continuity and standard of care especially across shifts and when arranging rotas and covering absences.
  - Conscientious, reliable, responsible and professional at all times, considerate, shows respect for opinions of others, values good advice, accepts constructive criticism.

### **Creating an environment conducive to learning and improvement**

- Endeavours to foster an environment conducive to learning
- Shares knowledge with trainees, students and other members of the multidisciplinary team
- Encourages and is open to reflective practice
- Seeks out role models and learns from the best practice behaviours of others.
- Participates in quality assurance and clinical improvement systems & training
- Uses evidence based practice in decision making
- Participates in journal clubs, case presentations, grand rounds

### **Time management & continuity of care**

- Is punctual for duty, meetings, handovers and other duties
- Prioritises workload
- Delegates when appropriate to do so
- Knows when to call for help
- Ensures satisfactory handover to ensure continuity of care
- Ensures satisfactory transfer of patients to other medical teams or services when required
- Makes adequate arrangements to cover holidays, study and other leave

### **Honesty & Integrity**

- Acts with honesty and integrity at all times in the delivery of patient care and in working with professional colleagues
- Acts fairly in all situations.

### **Moral Reasoning & Legal and ethical issues (see also Ethics section)**

- Describes and demonstrates an understanding of the main principles of medical ethics including autonomy, justice and confidentiality
- Understands correct procedures for obtaining consent (for treatment, investigations, procedures, research project, post mortem). Legal responsibilities surrounding death/disease certification; regarding mental illness; referrals to coroner; also in criminal cases.
- Understands issues surrounding confidentiality, disclosure/release of information; discovery (FOI) of records. Legal and ethical issues in context of resuscitation, organ donation/transplantation.
- Able to complete certificates, documents, respects patient's wishes, rights, but accepts a doctor's (legal) obligations to society. Able to obtain/provide in full, information relevant to consent.
  - Alert to possible legal implications and ethical aspects of actions
  - Ensures privacy when discussing sensitive issues
  - Seeks timely advice where patient abuse is suspected

### **Team working and leadership**

- How teams work, know how to assign individual and collective responsibilities which respect an individual's (*professional*) status within a team. How to set goals, initiate/co-ordinate action, audit performance, give feedback, e.g. developing guidelines, protocols.
- Positively contributes to planning, motivating, organising activity, employs negotiating, human relations, interpersonal skills appropriately.
- Able to set and apportion individual and team objectives, energise and fortify others to sustain efforts to achieve goals, appraise performance.
- Co-operates as team player; respects the contributions, expertise of others; tolerant but determined as team leader.
- Adopts a holistic approach to patient care
- Knowledge of principles of audit and self assessment

### **Health-Physical health and Handling Stress & Fatigue**

- Know how stress can affect performance, how to reduce stress and develop coping mechanisms to deal with pressure. When to enlist support.
- Understand the relevance of personal health to performance at work: the risks of self-medication, potential for drug and alcohol abuse: know that support is available from Occupational Health Services.
- Able to recognise, cope with stress; asks for help when necessary, is aware of responsibility (*to others*) of having health problems dealt with. Willing to take time off; and, if necessary, re-train/redevelop skills.

### **Commitment to Continuous Improvement in Health care Systems**

- Understands the principles of quality and safety improvement
- Participates in quality improvement activities, including standard setting, follows established practice guidelines, research and audit
- Undergoes training in this area where appropriate

## **SKILLS**

- Professionalism
- Multidisciplinary team working
- Ethical issues
- Leadership
- Time management
- Stress management

## ASSESSMENT & LEARNING METHODS

- RCPI Ethics programme: Ethics I, Ethics II, Ethics III and Ethics IV (mandatory)
- 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
- Leadership Programme (Year 3 – 5)

## Maintaining Good Practice

**Objective:** To adopt the habits of lifelong learning, and to appreciate and implement the practices of clinical governance.

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care, No. 6 Scholarship, No 7 Professionalism, No 8 Clinical Skills

### KNOWLEDGE

#### Lifelong learning

- Aware of CME/CPD obligations, systems/process for competence assurance/revalidation. Understand the role of appraisal, assessment methods available their application.
  - Sources, resources, opportunities for self-directed and group learning including IT. Know how adults learn.
  - Recognises and makes effective use of learning opportunities, maximises the potential for personal study, plans personal development.
  - Self motivated, inquisitive, eager to learn.

#### Application of clinical governance

- Understand the principles of evidence-based practice, clinical audit and effectiveness, the development/application of best-practice protocols.
- Able to appraise and apply data from research, and to use audit to establish best practice and clinical effectiveness. Utilizes and practices evidence-based medicine.
- Accepts the need for reflective practice and to critically evaluate own work and make changes.

#### Risk management

- Systems, procedures for identifying (*clinical*) risk; correct procedures and action when things go wrong; how to handle complaints.
- Employes procedures and policy for accidents, injuries; for confirming skill and staffing levels, arranging cross-cover, on-call, for supervision.
- Potential complications or side effects of treatments, procedures and investigations; importance of accurate, recent information and available records. The assessment of risk, relative risk.
- Able to assess, anticipate, risks; recognise failure. Openly discuss bad outcomes, locate system weakness, analyse critical incidents.
- Able to discuss potential risks *e.g. with patients, to analyse and balance risk with benefit*. Able to learn from previous experience, from complaints received, errors.
- Is honest in recognising misjudgements.

#### Evidence, audit, guidelines

- 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.
- Capable of accessing relevant data (library, internet use). Able to appraise available evidence critically.
- Able to complete an audit cycle relevant to practice; to develop, evaluate, review and update a set of guidelines.
- Uses evidence / guidelines appropriately having due regard for the individual.

## **SKILLS**

- Personal development planning
- Evidence -based practice
- Risk Management
- Audit
- Research

## **ASSESSMENT & LEARNING METHODS**

- Record of attendance at journal clubs, medical grand rounds, SpR teaching sessions, local and national academic meetings
- Record of attendance at CME accredited international meetings
- Attendance at local radiology conferences
- Time spent in laboratory or attendance at laboratory conferences
- Audit Study Day (Year 1)
- Annual Audit
- Leadership Skills Course (Year 3- 5)
- Research Publications
- Consultant feedback at annual assessment
- Workplace based assessment e.g Mini-Cex, DOPS, CBD

## Standards Of Care

**Objective:** To be able to assess patients' problems investigate and treat them appropriately, efficiently, and consistently over time.

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care; No. 2 Relating to Patients; No. 3 Communication and Interpersonal Skills; No. 4 Collaboration and Teamwork; No. 5 Management (including Self Management; No. 8 Clinical Skills,

### KNOWLEDGE

#### History taking and examination

- Diagnostic significance of patterns of symptoms, pathophysiology and physical signs.
- Able to take and analyse a clinical history and perform a reliable and appropriate examination, arrive at a differential diagnosis.
- Exhibit empathy and show consideration for all patients, their impairments and attitudes irrespective of cultural and other differences.

#### Investigation, indications, risks, cost-effectiveness

- Understand the pathophysiological basis of the investigation undertaken.
- Know and be able to explain the procedure for the commonly used investigations, preparations, effects or risks, the reason for the investigation, the information sought and its relevance to management.
- Sensitivity and specificity of results, possible interferences, artefacts.
- Able to understand significance, interpret and explain results of investigations.
- Shows logical approach in choosing, sequencing and prioritising investigations.
- Able to liaise, discuss, negotiate effectively with those undertaking the investigation.
- Careful to select investigations appropriately, considering (*patients'*) needs, risks, value.

#### Treatment and management of disease

- Understand the pharmacology, therapeutics of treatments prescribed, choice of routes of administration, dosing schedules, compliance strategies; the objectives, risks and complications of treatment cost-effectiveness. Natural history of diseases; quality of life concepts.
- Able to assess accurately patient's needs, to prescribe administer, deliver, arrange treatment; recognise and deal with reactions / side effects. Sets realistic therapeutic goals, utilizes rehabilitation services, palliative care appropriately.
- Able to discuss rationale, objectives, risks and alternative options openly, taking into account patients' / their relatives' attitudes, beliefs or other philosophical concepts.
- Recognises that the degrading effects of illness, especially incapacity which is chronic, impacts on relationships and family, having financial as well as social effects.
- Discusses, plans, delivers care appropriate to patient's needs and wishes.

#### Disease prevention and health education

- Disease notification; methods of collection and sources of data. Screening for disease, (*methods, advantages and limitations*). Health promotion and support agencies; means of providing and sources of information for patients.
- Risk factors, preventive measures, strategies applicable to smoking, alcohol, drug abuse, lifestyle changes.
- Able to advise on and promote lifestyle change, stopping smoking, control of alcohol intake. Able to assess and explain risk, encourage positive e.g. *immunisation* and negative preventive measures.

- Enlists / requires patients' involvement in solving their health problems, provides information, education. Avails of support provided by voluntary agencies and patient support groups, as well as expert services e.g. detoxification / psychiatric services.
- Non-judgemental approach to patient's problem: values contributions of health education and disease prevention to health in a community.

### **Notes, records, correspondence**

- Understand the functions of medical records, their value as an accurate up-to-date commentary and source of data.
- Understand the need and place for problem-orientated discharge notes, letters, more detailed case reports, concise out-patient reports, focused reviews.
- Compiles adequate case notes, with results of examinations, investigations, procedures performed, sufficient to provide an accurate, detailed account of the diagnostic and management process and outcome. Provides concise, informative progress reports orally.
- Maintains legible, authenticated records, uses dictation, telephone, e-mail appropriately.
- Appreciates importance of up-to-date, accurate information, its availability, transfer and the need for communicating promptly *e.g. with primary care*.

### **Time management and decision taking**

- How to prioritise demands, respond to patients' needs, sequence urgent tasks. Understand how to establish (*clinical*) priorities *e.g. for investigations, intervention; how to set realistic goals; understand the need to allocate sufficient time, know when to seek help*.
- Understands the need to complete tasks, reach a conclusion, make a decision, take action with allocated time.
- Able to recognise when falling behind and can adjust accordingly; able to cope with changing circumstances, variable demand, prepared to re-prioritise and ask for help.
- Able to collate evidence, summarise, recognise when objective has been gained
- Knows how and when to conclude, disengage.
- Has realistic expectations of own and of others' performance. Time-conscious, punctual.

### **Relevance of professional bodies**

- Understand 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*.
- Actively engages with professional/representative/specialist bodies.
- Values the breadth and depth of experience that can be accessed by associating with professional colleagues.

## SKILLS

- History taking and examination
- Appropriate use of investigations
- Treatment and management of disease
- Disease notification
- Health promotion
- Screening
- Study Day - Disease prevention & health education
- Personal and professional organisation and planning; goal setting, time management

## 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)
- Study Days
- Annual Audit

## Patient Safety

**Objective:** To ensure patient safety is at the core of the health service provided by designing safe systems and processes of care and understanding the role of healthcare systems and human factors in adverse events and errors.

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care.

### KNOWLEDGE

#### Safe Systems, Competency and Safe practice

- Understands multiple factors involved in failures;
- Safe Healthcare Systems-a Safe working environment
- The relationship between 'Human factors' and patient safety
  - Safe working practice. Role of procedures and protocols in optimal practice
- Patient safety relevance in health care and its role in minimizing the incidence and impact of adverse events and maximize recovery from them.
- Knowledge and understanding of the Swiss cheese model.
- Health care errors and system failures; human and economic costs; blame culture

#### Communication

- Disclosure – know the principles of open disclosure
- Knowledge and understanding of valid consent
- Teamwork
- Continuity of care

#### Near Misses and adverse events

- Knowledge of preventing and managing near misses and adverse events. Incident reporting; root cause analysis. Understanding and learning from errors
- Understands and manages clinical risk
- Manages complaints
- Knows when and how to report a near miss or adverse event

#### Quality improvement

- Standardises common processes and procedures – checklists, vigilance
- Evidence based care
- Infection control; healthcare associated infections
- Patient safety and invasive procedures.
- Improvement medication safety; safe prescribing; common medication errors
- Ethical behaviour

## **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
- Understand how and why systems break down and why errors are made
- Be able to learn from errors and near misses to prevent future errors
- Know how to use relevant information from complaints, incident reports, litigation and quality improvement reports to control risks
- Minimise infection through improved infection control practice
- Minimise errors during invasive procedures by developing and adhering to best-practice guidelines for safe surgery.
- Minimise medication errors by practicing safe prescribing principles

## **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): prioritization of patient safety in practice
- RCPI Patient safety on-line course (recommended)
- Completion of infection control induction in the workplace

## Therapeutics and Safe Prescribing

**Objective:** To progressively develop your 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:** No. 1 Patient Safety and Quality of Patient Care.

### KNOWLEDGE

- Indications, contraindications, side effects, drug interaction, dosage and route of administration of commonly used drugs
- Knowledge of prescribing for common medical conditions
- Knows range of adverse drug reactions to commonly used drugs, including complementary medicines
- Identifies common prescribing hazards
- Identifies high risk medications
- Knows drugs requiring therapeutic drug monitoring and interprets results
- Knows the effects of age, body size, organ dysfunction and concurrent illness or physiological state e.g. pregnancy on drug distribution and metabolism relevant to the trainees practice
- Recognise the roles of regulatory agencies involved in drug use, monitoring and licensing (e.g. IMB , and hospital formulary committees)
- Knows procedure for monitoring, managing and reporting adverse drug reaction

### SKILLS

- Knows how to write a prescription
- Prescribes appropriately in the elderly, childhood, pregnancy and breast feeding
- Make appropriate dose adjustments following therapeutic drug monitoring, or physiological change (e.g. deteriorating renal function)
- Review the continuing need for long term medications relevant to the trainees clinical practice
- Anticipate and avoid defined drug interactions, including complementary medicines
- Advise patients (and carers) about important interactions and adverse drug effects
- Provide comprehensible explanations to the patient, and carers when relevant, for the use of medicines
- Open to advice and input from other health professionals on prescribing
- Participates in adverse drug event reporting

### 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): prioritization of patient safety in prescribing practice

## Infection Control

**Objective:** To be able to manage and control infection in patients, including controlling the risk of cross-infection, appropriately managing infection in individual patients, and within the wider community to manage the risk posed by communicable diseases.

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care; No. 5 Management (including Self Management).

### KNOWLEDGE

#### Within a consultation

- Understand the principles of infection control as defined by the HIQA
- How to minimize the risk of cross-infection during a patient encounter by adhering to best practice guidelines available
- Treat and manage infection in the individual patient
- Understand the principles of preventing infection in high risk groups e.g managing antibiotic use to prevent Clostridium difficile) Knowledge and understanding the local antibiotic prescribing policy
- Aware of infections of concern, eg MRSA, C Difficile,
- Understands best practice in isolation precautions
- Knows when and how to notify relevant authorities in the case of infectious disease requiring disclosure

#### In surgery or during an invasive procedure

- Understands the increased risk of infection in these patients and adheres to guidelines for minimizing infection in such cases
- Knows the guidelines for needle stick injury prevention and management

#### During an outbreak

- Adheres to guidelines for minimizing infection in the wider community in cases of communicable diseases and seeks expert opinion or guidance from infection control specialists where necessary

### SKILLS

- Practices aseptic techniques, hand hygiene
- Follows guidelines for infection control and management
- Prescribes antibiotics according to antibiotic guidelines Encourages all staff, patients and relatives to observe infection control principles
- Communicates effectively with patients regarding treatment and measures recommended to prevent re-infection or spread
- Collaborates with infection control colleagues to manage more complex or uncommon types of infection including those requiring isolation eg transplant cases, immunocompromised host
- In the case of infectious diseases requiring disclosure:
  - Has knowledge of the diseases requiring disclosure and undertakes notification promptly
  - Collaborates with external agencies regarding reporting, investigating and management of notifiable diseases .
  - Able to advise patients on lifestyle change to minimize the risk of re-infection or spread of infection,
  - Enlists / requires patients' involvement in solving their health problems, provides information, education.
  - Avails of support provided by voluntary agencies and patient support groups, as well as expert services where appropriate

- Non-judgemental approach to patient's problem:
- Utilises and values 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

## 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:** No.1 Patient Safety and Quality of Patient Care; No. 3 Communication and Interpersonal Skill; No. 4 Collaboration and Teamwork; No. 5 Management (including Self Management); No 6 Scholarship.

### KNOWLEDGE

#### Demonstrating Personal Qualities

- Develops self-awareness and understanding of personal style and its impact on others
- Efficiently and effectively manages 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
- Acts with integrity and honesty with all people at all times

#### Working with others

- Develops networks to expand knowledge and sphere of influence
- Builds and maintains key relationships. Adapts style to work with different people and different situations
- Encourages contributions from others including patients, carers, members of the multidisciplinary team and the wider community
- Aware of own personal style and other styles and their impact on team performance. Understands the importance of good communication in teams and the role of human factors on effectiveness and patient safety

#### Managing Services

- Knows and understands the structure and function of Irish Health Care System
- Aware of the challenges of managing in healthcare
  - Role of Governance
  - Clinical Directors
- Can contribute to the planning and design of services
- Knows and understands the financing of the health service
  - Preparing a budget
  - Defining value
  - Managing resources
- Knows and Understands the importance of human factors in service delivery.
  - Manages staff training, development and education
- Managing performance
  - Performs staff appraisal and deals effectively with poor staff performance
  - Rewards and incentivises staff for quality and efficiency

#### Improving Services

- Ensures patient safety by adopting and incorporating a patient safety culture
- Critically evaluates where services can be improved by measuring performance, and acting to raise standards where possible Encourages a culture of improvement and innovation
- Facilitating transformation by creating and living a vision

## Setting Direction

- Identifies the external and internal drivers setting the context for change
- Applies knowledge and evidence of systems and resource management to guide service development
- Makes decisions using evidence based medicine and performance measures
- Evaluates 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 Being able to managing resources and people
- Managing performance, performance indicators
- How to write and develop a service plan
- How to prepare and manage a budget

## ASSESSMENT & LEARNING METHODS

- Communication course (Year 1)
- Leadership course (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.

# Management Information Systems & Management Skills

**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:** No. 5 Management.

## KNOWLEDGE

### Health service structure, management and organisation

- The administrative structure of the Health Service, services provided in Ireland and their funding. Department of Health, HSE and Hospital Management structures and systems. The National Regulatory Bodies, health agencies and patient representative groups.
- Can explore, direct, pursue a project, negotiating through the relevant department at an appropriate level. Able to “*operate the system*”. Understand the need for business plans, annual hospital budgets, the relationship between the hospital and PCCC.
- Recognises the advantage of understanding the administrative machinery of the Health Services.

### 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. Know of the sources which can provide information relevant to national or to local services, publications available.
- Able 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.

### Obtaining information of value in maintaining medical knowledge with a view to delivering effective clinical care

- Understands the contribution that current, accurate knowledge can make to establishing clinical effectiveness, best practice, treatment protocols. Know sources providing updates, literature reviews and digests.
- Able 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*.
- Embraces principles of clinical governance.

### Delegation skills, empowerment and conflict management

- How to assess, develop personal effectiveness, improve negotiating, influencing and leadership skills. How to manage time more efficiently, deal with pressure and stress. How to motivate and operate within a multidisciplinary team.
- Able to adjust to change, apply management/leadership, negotiating skills to manage change. Self-awareness, able to recognise strengths and weaknesses.
- Appropriately values and uses management techniques and seeks to improve these skills and personal effectiveness.

## **Leadership**

- How to maintain, improve working relationships within a team; appropriately recognise roles, skills, status. Know when and what to delegate, provide support, appraise.
- Motivates and empowers others, knows when help is needed. Able to foresee, forestall, manage conflict.
- Sensitive to and aware of the needs of others.

## **SKILLS**

- Risk Management
- Leadership skills
- Time management
- Delegation skills
- Conflict management
- Clinical governance
- Audit

## **ASSESSMENT & LEARNING METHODS**

- Communication course (Year 1)
- Audit course (Year 1)
- Leadership course (Year 3 – 5)
- Annual audit
- Consultant feedback at annual assessment on management and leadership skills
- Involvement in hospital committees

## Teaching & Research

**Objective:** To recognise the opportunities for personal/professional development that exist for medical teachers, educational supervisors and from involvement with research.

**Medical Council Domains of Good Professional Practice:** No. 6 Scholarship.

### KNOWLEDGE

#### Teaching, educational supervision and assessment

- Know principles of adult learning, teaching and learning methods available and strategies; educational principles directing assessment, methods, formative vs. summative. Value of regular appraisal / assessment in informing training process.
- Able to identify educational objective. Able to design and deliver an effective teaching event, both small and large group. Uses technology / materials effectively. Adequate preparation, timekeeping.
- Appreciates benefit to learner is key objective of teaching sessions, key resource is adequate knowledge of subject.

#### Research, methodology and critical evaluation

- How to design and resource a research project, how to obtain ethical approval. Research methodology, valid statistical analysis, writing and publishing papers. Ethical considerations, declaring an interest.
- Reviewing the literature, framing the question, designing a project capable of providing an answer. Able to derive results and conclusions, able to write or present a paper.
- Intellectually honest.
- Present data in a clear, honest and critical fashion.

### SKILLS

- Bed-side undergraduate and post graduate teaching
- Lectures
- Ethics of research
- Presentation and writing skills

## Ethics

**Objectives:** *Medicine is predominantly concerned with the diagnosis and treatment of illness. Besides the pathological processes involved and the physical impact of each condition, the requirements for practising medicine in a fair, competent and ethical manner must be understood before a doctor is ready for independent practice.*

*Upon satisfactory completion of specialist training, 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 Irish healthcare system.*

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care; No. 3 Communication and Interpersonal Skill; No. 6 Scholarship; No. 7 Professionalism.

### KNOWLEDGE

- Knowledge of 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 informational exchange with individual patients and their families and teamwork with other health professionals, the scientific community and the public.
- Professionalism.

## Ethics I: Professionalism

**Objectives:** *To explore the relationship between ethics of healthcare delivery and professionalism including the challenges and the impact of current developments*

### KNOWLEDGE

- Knowledge, skills, attitudes and behaviours expected by patients and society from individuals during the practice of their profession (as a doctor).
  - The skills of lifelong learning and the maintenance of competence
  - Information literacy
  - Ethical behaviour
  - Integrity, honesty
  - Altruism
  - Service to, justice and respect for others
  - Adherence to professional code
- Leadership and Accountability
- Role of the Clinical Director
- Dignity & Respect
- Conflicts of interest
- Personal scope of practice & boundaries
- Adverse Events- open communication when adverse events occur
- Discussing errors

## Ethics II: Ethics & Law

**Objectives:** *To explore the relationship between ethics of healthcare and law including the challenges and the impact of current developments*

### KNOWLEDGE

- Ethical patient care and Irish Law including:
- Informed consent
- Consent and capacity
- Disclosure
- Medical Practitioner's Act
- Malpractice
- Misconduct
- Confidentiality
- Data protection
- Coroner's System
- Medical Council Ethical Guide

## Ethics III: Research

**Objectives:** *To explore the ethics of healthcare research including the challenges and the impact of current developments*

### KNOWLEDGE

- Principles of research
- Un-ethical conduct
- Genetics
- The Importance of Research in Health Care
- Dept of Health and Children Research Action Plan-implications for researchers
- Reasons for Research being Ethically Regulated
- Genetics
- Researching vulnerable groups
- Data Research/Protection and confidentiality
- Patient information bill
- Human Tissue Act
- Role of Research Ethics Committee
- Conflict of interest

## **Ethics IV: End of Life**

**Objectives:** *To explore the ethics of end of life challenges and the impact of current developments*

### **KNOWLEDGE**

- Euthanasia/Terminal Sedation
- Artificial nutrition/hydration
- Resuscitation issues
- Advanced Directives
- Organ donation
- Death Certification/Coronial System
- Prolongation
- Futility
- Decision making process

### **SKILLS**

- Recognises the dying patient
- Communicates bad news sensitively
- Explores the options for managing the dying patient including DNR and advanced directives
- To incorporate the above ethical concepts in their everyday practice

### **ASSESSMENT & LEARNING METHODS**

- RCPI Ethics programme: Ethics I, Ethics II, Ethics III and Ethics IV (Mandatory)
- Note of examples of ethical dilemmas encountered in training
- Consultant feedback at annual assessment
- Workplace based assessment e.g CBD
- Educational supervisor's reports on observed performance (in the workplace)

## Dealing with and Management of Acutely ill Patients in Appropriate Specialties

**Objective:** To have the knowledge and skills to be able to assess and initiate management of patients presenting as emergencies with the problems outlined below. For each scenario, trainees should in particular gain knowledge and skills to recognise the critically ill and:

*Immediately assess and resuscitate if necessary.*

*Formulate a differential diagnosis, treat and/or refer as appropriate.*

*Select relevant investigations and accurately interpret reports.*

*Communicate the diagnosis and prognosis – see Generic Skills.*

**Medical Council Domains of Good Professional Practice:** No. 1 Patient Safety and Quality of Patient Care, No. 8 Clinical Skills

### KNOWLEDGE

#### Management of acutely ill patients with medical problems

- Know how potentially life-threatening problems present; know the indications for urgent intervention, additional information necessary to support action (*e.g. results of investigations*) and treatment protocols (*see Addendum*).
- Know when to seek help, refer/transfer to another specialty. Know ACLS protocols. Know the ethical and legal principles relevant to resuscitation and DNR orders.
- Able to manage acute medical intake, to receive and refer patients appropriately, to interact efficiently and effectively with other members of the medical team, accept/undertake responsibility appropriately.
- Able 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*.
- Able to convey essential information quickly to relevant personnel: maintains legible up-to-date records documenting results of investigations. Lists of problems dealt with or remaining, identifies areas of uncertainty; ensures safe handover.
- Remains calm, delegates appropriately, ensures good communication. Tries to meet patient's/ relatives' needs and concerns, respecting their views and right to be informed.

#### Discharge planning

- Distinguish between illness and disease, disability and dependency. Understand the potential impact of illness and impairment on activities of daily living, family relationships, status, independence. Be aware of quality of life issues.
- Know role and skills of other members of the healthcare team, how to devise and deliver a care package. Know the support available from other agencies *e.g. specialist nurses, social workers, community care*. Understand the principles of shared care with the general practitioner service.
- Show awareness of the pressures/dynamics within a family, the economic factors delaying discharge but recognise the limit to benefit derived from in-patient care. Establish liaison with family and community care, primary care, communicate / report to agencies involved.
- Demonstrates an awareness of the wide ranging effects of illness and the need to bridge the gap between hospital and home.

## **SKILLS**

- ACLS
- Deal with common medical emergencies
- Interpretation of blood results, ECG/Rhythm strips, Chest X-Ray, CT Brain
- Give clear instructions to both medical and hospital staff
- Order relevant follow up investigations
- Discharge planning
- Knowledge of patient pathways
- Knowledge of HIPE
- Multidisciplinary team working
- Communication
- Early regular and on-going consultation with family members and primary care physicians

## **ASSESSMENT & LEARNING METHODS**

- Certified ACLS
- Record of on call
- miniCEX (acute setting) - each year
- Case based discussions
- Consultant feedback at annual assessment

**Specialty Section for  
Clinical Microbiology**

# Fundamental Skills

## KNOWLEDGE

- Thorough understanding of laboratory health and safety practice
- Safe handling of clinical samples in the laboratory
- Understanding of quality assurance in the diagnostic laboratory
- Develop core reporting skills
- Understanding of microbiology, mycology virology and parasitology to offer basic 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 HPSC
- 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

## Core Knowledge

**Objective:** To achieve sufficient understanding of laboratory microbiology and virology to offer basic 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 infectious diseases and the role of host response in immunopathology
- 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)/examination procedures (EPs) and the importance of audit and quality control 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 SOPs/EPs.
  - 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 drug monitoring and its uses.
  - Have a basic understanding of the management (under supervision) of the following:
    - genitourinary tract infection including sexually transmitted infections (STIs) and bacterial
    - 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
- rashes and rash contacts (pregnant and non pregnant)
- infections in pregnancy, including methods of diagnosis, and implications of infection for mother and fetus
- congenital infection and infection acquired perinatally
- infections in the immunocompromised including basic understanding of how to make the diagnosis of infection and treatment options
- deep infection (e.g. septicaemia, endocarditis, bone infection)
- common nosocomial infection (e.g. device-associated infection)
- infection in travellers (e.g. malaria)
- Treatment and prevention strategies
  - Basic 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 knowledge of desensitisation protocols
- Infection control
  - Understanding of routes of transmission and methods of preventing nosocomial spread of common and important infecting organisms, e.g.:
    - methicillin-resistant *Staphylococcus aureus*
    - vancomycin-resistant enterococci
    - varicella zoster virus
    - enteric infections including viral diarrhoea
    - respiratory tract infections
    - blood-borne viruses
    - extended-spectrum beta-lactamase-producing organisms (ESBLs)
    - multiply-resistant *Acinetobacter baumannii*
    - *Clostridium difficile* - associated diarrhoea.
  - Understand issues surrounding the isolation of the febrile traveller.
  - Understand the principles and practice of surveillance and public health with particular regard to food-borne and vaccine-preventable infections and STIs.
  - Be aware of emerging infections
- 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 serodiagnosis 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

- FRCPATH

## Out-of-Hours' Working

*Provision of a consultative service for medical microbiology advice 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 continuity of care.
- Refer to seniors as appropriate.
- Prioritise regarding urgency.
- Deal with difficult situations independently

### ASSESSMENT & LEARNING METHODS

- 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 E-test, broth dilution and automated methodologies with appropriate quality control.
  - Understand the use and limitations of the antibiogram for outbreak investigation and control.
- Understand serologic and antigen-based techniques
- Molecular diagnostic techniques
  - Have knowledge of the principles of nucleic acid based techniques including PCR (including real-time polymerase chain reaction [RT-PCR]), LCR (ligase chain reaction), NASBA (Nucleic Acid Sequence Based Amplification), transcription-mediated amplification (TMA) , Strand Displacement Assay (SDA) and nucleic acid sequencing.
- 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
- Knowledge of laboratory accreditation
- Familiar with:
  - external quality control including
  - National External Quality Assessment Service (NEQAS) schemes
  - internal quality control and internal quality assurance
  - commercially available laboratory computer systems
  - staff performance management and appraisals
  - team working
  - time management
  - decision making and prioritisation skills
  - negotiation skills
  - managing underperformance
  - wider organisational issues, e.g. pathology modernisation programmes.

## SKILLS

- Process all routine specimens 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 clinically of latex agglutination, enzyme-linked immunosorbent assay (ELISA), immunofluorescence, complement fixation test (CFT) and the various controls.
- 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
- Leadership course
- DOPS: Microscopy
  - Direct microscopy on CSF
  - Fluorescence microscopy
  - Culture a clinical sample
  - Anti-microbial sensitivity testing (Year 1)

## 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)
  - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) (UK)
  - Control of Substance Hazardous to Health (COSHH) Regulations (UK)
  - Genetically Modified Organisms (**Contained Use**) Regulations (2001) (UK)
  - Management of Health and Safety at Work Regulations (1999) (UK)

### 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

- Case based discussion: Infection control risk assessment
- FRCPATH
- Study day

# Clinical Microbiology

## Clinical Skills

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

- Infection in the community.
- Hospital-acquired infection and infection control and prevention.
- Infection in immunocompromised patients including HIV, transplantation and neutropenia.
- Infection in critical care and sepsis.
- Outbreaks of infection in hospital and the community.
- Infection in the returning traveller.
- Food and water borne infection.
- Sexually transmitted diseases.
- Occupationally acquired disease.
- Paediatric infection.
- Infection in pregnancy
- Eye infections
- Hepatitis virus infection.

## 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 disease
- 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

### 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 antimicrobial in the clinical setting.
- Liaison between clinicians and laboratory.
- Make accurate risk assessment.
- Recognise when urgent epidemiological action is required.

### ASSESSMENT & LEARNING METHODS

- FRCPATH
- Study Day
- Case Based Discussion - 1 per year

# Health Care Associated Infection and Infection Prevention and Control

**Objective:** Understanding of specific infection problems related to healthcare-associated infections (HCAIs).

## 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*
- 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,
- HCAIs in the neonatal intensive care unit (NICU), SCBU, burns units, dermatology wards, dialysis unit etc.
- Context of MRSA, vancomycin-resistant enterococcus (VRE), ESBL producers, etc. in the above infection
- 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. HCC
- 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 HAI prevention and control
  - Ability to describe these, including audit approaches.
- Ventilation: importance if 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 HAIs.
- Distinguish infection from colonisation.
- Describe the above dynamics for these organisms.
- 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.  
Evidence of participation in, and reflections on, surveillance and audit cycles.
- 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.

## ASSESSMENT & LEARNING METHODS

- FRCPATH
- Study Day
- Case Based Discussion each year

# Immunocompromised Patients Including HIV, Transplantation and Neutropenia

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

## KNOWLEDGE

- Pathophysiology and clinical signs and symptoms of infection in compromised hosts
- Knowledge of biological and iatrogenic 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

- FRCPATH
- Study Day

# 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-associate 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

- FRCPATH
- Case Based Discussion

# 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 contact other sources of information and support when appropriate.
  - Use of appropriate IT methodologies and statistics.
- Knowledge about the availability of expertise, e.g. modelling including reference centres
  - Understanding of modelling methods and their limitations.

## 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 out-break management, e.g. Public health, HPSC, occupational health department and reference laboratories.
- 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
- Case Based Discussion - Management of an outbreak infection

## Infection in the Returning Traveller

**Objective:** to understand the burden of infectious disease in developing countries and be able to advise on appropriate investigation and management of patients who have recently returned from overseas.

### 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 travellers or imported infections, e.g. West Nile virus, other arboviruses
- 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

- Skills in the diagnosis of the above infections
- Investigation and diagnosis of travellers with specific presentations, e.g. diarrhoea, fever, lymphadenopathy, soft tissue involvement.
- Advice for 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

# 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

- Basic 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 Agency 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 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

# Sexually Transmitted Disease

*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 increasing 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, PCR
  - 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

- FRCPATH

## Occupationally Acquired Disease

### 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

- FRCPATH

## Paediatric Infection

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

### KNOWLEDGE

- 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.

### 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
- 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.
- See Section on Virology page 64

## 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

- FRCPATH
- Study Day

# Specialist Areas of Microbiology

## Virology

*Microbiology trainees should normally undertake six months training in virology. The delivery of the virology training is a local matter.*

### KNOWLEDGE

- Pregnancy and viral infection
- Knowledge of investigation, intervention and advice for women with or in contact with rash illness in pregnancy.
- Knowledge of natural history of cytomegalovirus rubella, parvovirus B19, measles, enterovirus, hepatitis B, HIV, hepatitis C in relation to pregnancy
  - 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 lookback 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
  - Pharyngitis
  - 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
  - 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
  - Smallpox - Identification and investigation
  - 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
  - Rickettsial diseases - systemic and rash associated illness-distribution diagnosis and management
- Rash illness – non-pregnant
- Encephalitis and meningitis
- Herpes simplex –investigation and management
- Enteroviral
- Recurrent herpes simplex virus
- Psittacosis and *Chlamydia pneumoniae*
- Q fever
- 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
  - BK
  - 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**

- FRCPATH
- Study Day
- Case Based Discussion

# 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.
- Agents of bio-terrorism
  - Be aware of the potential for abuse of laboratory organisms for bioterrorism and the current relevant legislative framework, including the Prevention of Terrorism Act 2004.
- 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

- 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
- Examine skin, hair, nails etc for presence of fungal elements.
- 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

- FRCPATH
- Practical skills course in mycology (optional)

# Parasitology

## 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 parasite infections in the context of pregnancy.

## SKILLS

- Examine 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

- FRCPATH
- Practical Skills course in Parasitology (optional)

# Communication and Management Issues in Microbiology

**Objectives:** to develop necessary management, communication and leadership skills to run 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
- 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, Food Standards Agency of Ireland (FSAI) 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 the Data Protection Act
- Define how to undertake searches.
- 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 competent 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

- Leadership Skills course
- FRCPATH
- Audit

## APPENDIX 1

### Acronyms

<i>ARCP</i>	Annual Review of Competence Progression
<i>BBV</i>	Blood-borne virus
<i>BMA</i>	British Medical Association
<i>BMS</i>	Biomedical scientist
<i>CATT</i>	College Advisory Training Team
<i>CbD</i>	Case-based discussion
<i>CCDC</i>	Consultant in communicable disease control
<i>CCT</i>	Certificate of Completion of Training
<i>CDSC</i>	Communicable disease surveillance centre
<i>CESR</i>	Confirming eligibility for specialist registration
<i>CFT</i>	Complement fixation test
<i>CJD</i>	Creutzfeldt-Jakob disease
<i>CMT</i>	Core medical training
<i>CMV</i>	Cytomegalovirus
<i>COSHH</i>	Control of Substance Hazardous to Health Regulations
<i>CPA</i>	Clinical Pathology Accreditation
<i>CPD</i>	Continuing professional development
<i>CPHM</i>	Consultant in Public Health Medicine
<i>CSSD</i>	Central Sterile Services Department
<i>DIC</i>	Disseminated intravascular coagulation
<i>DNA</i>	Deoxyribonucleic acid
<i>DOPS</i>	Directly observed procedures
<i>EBV</i>	Epstein Barr virus
<i>ECE</i>	Evaluation of clinical events
<i>EHO</i>	Environmental health officer
<i>EIA or ELISA</i>	Enzyme-linked immunoassays or Enzyme-linked immunosorbent assay
<i>ESBL</i>	Extended-spectrum beta-lactamase-producing organism
<i>ESCV</i>	European Society for Clinical Virology
<i>FEW</i>	Food, environmental and water
<i>FRCPATH</i>	Fellowship of the Royal College of Pathologists

<i>FSA</i>	Food Standards Agency
<i>FSAI</i>	Food Safety Authority of Ireland
<i>GIT</i>	Gastro-intestinal
<i>GMC</i>	General Medical Council
<i>GP</i>	General practitioner
<i>GRE</i>	Glycopeptide-resistant enterococci
<i>GUM</i>	Genito-urinary medicine
<i>HAI</i>	Hospital-acquired infection
<i>HCC</i>	Healthcare Commission
<i>HCW</i>	Healthcare worker
<i>HEV</i>	Hepatitis E Virus
<i>HIV</i>	Human immunodeficiency virus
<i>HPA</i>	Health Protection Agency
<i>HPSC</i>	Health Protection Surveillance Centre
<i>ICC</i>	Infection Control Committee
<i>ICD</i>	Infection control doctor
<i>ICT</i>	Infection Control Team
<i>ICU</i>	Intensive care unit
<i>IF</i>	Immunofluorescence
<i>IgG</i>	Immunoglobulin G
<i>IgM</i>	Immunoglobulin M
<i>IT</i>	Information technology
<i>JCPT</i>	Joint Committee on Pathology Training
<i>JRCPTB</i>	Joint Royal Colleges of Physicians Training Board
<i>LAC</i>	Lay Advisory Committee
<i>LCR</i>	Ligase chain reaction
<i>Mini-CEX</i>	Mini-clinical evaluation exercise
<i>MLA</i>	Medical laboratory assistant
<i>MMC</i>	Modernising Medical Careers
<i>MRCP</i>	Membership of the Royal College of Physicians
<i>MRCP(I)</i>	Membership of the Royal College of Physicians, Ireland
<i>MRSA</i>	Meticillin-resistant <i>Staphylococcus aureus</i> At least one place elsewhere spelled as methicillin
<i>NASBA</i>	Nucleic Acid Sequence Based Amplification
<i>NEQAS</i>	National External Quality Assurance Service
<i>NHS</i>	National Health Service
<i>NICE</i>	National Institute for Health and Clinical Excellence
<i>NICU</i>	Neonatal intensive care unit
<i>NPSA</i>	National Patient Safety Agency
<i>NTN</i>	National Training Number
<i>NTN(A)</i>	National Training Number (Academic)
<i>OOPE</i>	Out-of-programme experience
<i>PCR</i>	Polymerase chain reaction
<i>PMETB</i>	Postgraduate Medical Education and Training Board
<i>RE</i>	Regional epidemiologist
<i>RIDDOR</i>	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
<i>RITA</i>	Record of In-Training Assessment
<i>RNA</i>	Ribonucleic acid
<i>RSV</i>	Respiratory syncytial virus
<i>RT-PCR</i>	Real time - polymerase chain reaction
<i>SAC</i>	Specialist Advisory Committee
<i>SCBU</i>	Special care baby unit

<i>SDA</i>	Strand Displacement Assay
<i>SGM</i>	Society for General Microbiology
<i>SOP</i>	Standard operating procedures
<i>ST</i>	Specialty training
<i>STC</i>	Specialty Training Committee
<i>STI</i>	sexually transmitted infection
<i>TAC</i>	Trainees Advisory Committee
<i>TB</i>	Tuberculosis
<i>TSE</i>	Transmissible spongiform encephalopathy
<i>VCJD</i>	Variant Creutzfeldt-Jakob disease
<i>VHF</i>	Viral haemorrhagic fever
<i>VRE</i>	Vancomycin-resistant enterococcus

## Minimum Requirements for Training

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
<b>Section 1 - Training Plan</b>				
<b>Personal Goals Plan</b> (Copy of agreed Training Plan for your current training year signed by both Trainee & Trainer)	Required	1	Training Post	Form 052
<b>Weekly Timetable</b> (Sample Weekly Timetable for Post/Clinical Attachment)	Required	1	Training Post	Form 045
<b>Section 2 - Training Activities</b>				
<b>Ward Rounds</b> (One entry per week on average)	Required	40	Year of Training	Form 096
<b>Liaison with other specialities</b> (Record one entry per week on average)	Required	40	Year of Training	Form 084
<b>Procedures/Practical Skills/Surgical Skills</b> (Minimum of 1 entry per month on average (once 10 procedures at level 3 have been recorded a satisfactory level has been reached, it will not be necessary to record any more)				
This should include the following categories:				
Specimen Accessioning and handling	Required	10	Training Programme	Form 004
Culture and reading of plates	Required	10	Training Programme	Form 004
Antimicrobial susceptibility testing	Required	10	Training Programme	Form 004
Light microscopy (detection of bacteria and parasites), serological testing, molecular techniques	Required	10	Training Programme	Form 004
Other	Desirable	0		
<b>Cases/Clinical Experience/Specialised Rounds</b> (Minimum of 2 important cases per week)	Required	80	Year of Training	Form 085
This should include the following categories:				
Participation in general laboratory service management				
Managing Clinical errors and complaints				

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Laboratory accreditation				
Implementing changes to laboratory service level				
staffing and recruitment				
Other				
<b>Laboratory Experience</b> (Minimum 2 entries per week)	Required	80	Year of Training	Form 018
<b>Relatively Unusual Cases</b> (Complete at least one form 019 per quarter (on average) cases should be discussed with your trainer)	Required	4	Year of Training	Form 019
<b>Guidelines/Policies</b> (A SpR should be involved in a minimum of 1 policy or guideline per 6 months (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)	Required	2	Year of Training	Form 087
<b>Infection Control</b> (Record a minimum of 1 entry per category per month and cover a broad range of activities over the period of your training)	Required	10	Year of Training	Form 088
This should include the following categories:				
Outbreaks	Required	10	Year of Training	Form 088
Hospital building	Required	10	Year of Training	Form 088
Environmental issues	Required	10	Year of Training	Form 088
Inoculation injury	Required	10	Year of Training	Form 088
Infection control meetings	Required	10	Year of Training	Form 088
Other	Required	10	Year of Training	Form 088
<b>Offsite Activities</b>	Required	0	Training Programme	Form 082
This should include the following categories:				
Community Activities				
Day-care Activities				
Domiciliary Visits				
Other				

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
<b>Management Experience</b>	Required	0	Training Programme	Form 110
<b>Section 3 - Educational Activities</b>				
<b>Mandatory Courses</b>				
Clinical Audit (1 <sup>st</sup> year SpRs)	Required	1	Year of Training	Form 006
Communications Skills (1st year SpRs)	Required	1	Training Programme	Form 006
Leadership Skills (3 <sup>rd</sup> year upwards)	Required	1	Training Programme	Form 006
Ethics:				
1 Ethics I Professionalism	Required	1	Training Programme	Form 006
2 Ethics II Ethics & Law	Required	1	Training Programme	Form 006
3 Ethics III Research	Required	1	Training Programme	Form 006
4 Ethics IV Pathology	Required	1	Training Programme	Form 006
<b>Non – Mandatory Courses</b>	Desirable	0	Training Programme	Form 007
<b>Study days</b> (Minimum of 5 study days per year)	Required	5	Year of Training	Form 008
<b>In-house activities</b> Minimum of 1 per month from the categories below:	Required	10	Year of Training	Form 011
Grand Rounds				
Journal Club				
Radiology Conference				
Pathology conference				
MDT Meetings				
Seminar				
Lecture				
Other				
<b>Examinations</b>				
FRC Path examination Part 1 and Part 2	Required	1	Training Programme	Form 012
Other				
<b>Formal Teaching Activity</b> (Minimum of 1 per 6 months of training (on average))	Required	2	Year of Training	Form 013
This should include the following categories:				

Curriculum Requirement	Required/Desirable	Minimum Requirement	Reporting Period	Form Name
Lecture				
Tutorial				
Bed side teaching				
Other				
<b>Research</b> (Minimum of 2 research projects during training - not inclusive of a year out for research – note projects may be in modest scope)	Required	2	Training Programme	Form 014
<b>Audit activities</b> (Minimum of 1 per year)	Required	1	Year of Training	Form 015
<b>Publications</b> (Minimum of 1 paper submitted for publication to a peer reviewed journal during the training period)	Required	1	Training Programme	Form 016
<b>Presentations</b> (Minimum of 1 presentation at National and International meetings per year of training on average)	Required	1	Year of Training	Form 017
<b>National/International meetings</b> (At least one National meeting per year (minimum of 4 over the course of training)	Required	1	Year of Training	Form 010
<b>Additional Qualifications</b>	Desirable	N/A	Training Programme	Form 065
<b>Committee Attendance</b> (Sit on least an Infection control committee and a Lab management committee – record minimum of 1 per year of training particularly for years 3, 4 and 5.	Required	1	Year of Training	Form 063
<b>Section 4 - Work Place Based Assessments</b>				
<b>DOPS</b>				
for example:				
Microscopy	Required	1	Training Programme	Form 021
Direct microscopy on CSG	Required	1	Training Programme	Form 021
Florescent microscopy	Required	1	Training Programme	Form 021
Culture a clinical sample	Required	1	Training Programme	Form 021
Anti-microbial sensitivity testing	Required	1	Training Programme	Form 021
Other	Desirable	0		
<b>CBD</b> (A minimum is one Case Based Discussion per year of training is expected on average)	Required	1	Year of Training	Form 020

<b>Curriculum Requirement</b>	<b>Required/Desirable</b>	<b>Minimum Requirement</b>	<b>Reporting Period</b>	<b>Form Name</b>
See examples below:				
Infection control risk assessment	Desirable	0	Training Programme	
Infection in the community	Desirable	0	Training Programme	
Health care associated infection and Infection prevention and control	Desirable	0	Training Programme	
Infection in critical care and sepsis	Desirable	0	Training Programme	
Management of an outbreak infection	Desirable	0	Training Programme	
Virology	Desirable	0	Training Programme	
<b>Mini-CEX</b> (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	Form 023
<b>Section 4b - Quaterly End of Year Assessments</b>				
<b>Confidential Trainee Assessment of Post</b>	Required	N/A	Year of Training	Form 050
<b>Quaterly EYA</b>	Required	N/A	Year of Training	Form 092
<b>Summary of Training Completed Year on Year Clinical Microbiology</b>	Required	N/A	Year of Training	Form 098
<b>Summary of Training Completed Year on Year Generic</b>	Required		Year of Training	Form 097
<b>Assessment Outcome recommendations</b>	Required	N/A	Year of Training	Form 060
<b>Research Reports</b>	Desirable	N/A	Training Programme	Form 099
<b>Section 5 - Additional Forms</b>				
<b>OPE</b>	Required	N/A	Training Programme	Form 047
<b>Leave of Absence</b>	Required	N/A	Training Programme	Form 048