Curriculum for Specialty Training in Oral Microbiology

Oral Microbiology Sub–committee of the Specialty Advisory Committee for the Additional Dental Specialties
Association for Clinical Oral Microbiology
Royal College of Pathologists

Contents

1. Introduction

Oral Microbiology in the UK is a Dental specialty overseen by the General Dental Council and Oral Microbiologists must be registered on the specialist list in Oral Microbiology of the GDC. The award of the Certificate of Completion of Specialist Training (CCST) will require evidence of satisfactory completion of training in all aspects of Oral Microbiology which are outlined in this curriculum.

Specialist training in oral microbiology is closely linked with the curriculum, training and assessment programme set out for medical microbiology and virology overseen by the Royal College of Pathologists. Indeed, the programme is identical in every aspect apart from additional specialist modules in oral microbiology and entry to the Specialist list for oral microbiology. The award of the Certificate of Completion of Specialist Training (CCST) in oral microbiology will require evidence of satisfactory completion of training which is outlined in this curriculum.

The curriculum complies with:

- The Postgraduate Medical Education and Training Board's (PMETB) *Standards for Curricula* [1]
- A Reference Guide for Postgraduate Dental Specialty Training in the UK (The Gold Guide)

For trainees with an NTN or NTN(A) in an approved UK training programme, the curriculum is integrated with and supported by the following documents in order to produce a coordinated training package for the award of the CCST. The relevant package includes:

• a blueprint for the oral/medical microbiology and virology assessment systems (This demonstrates how the College assessments and examinations test the structure of the medical microbiology and virology curriculum.)
• regulations and guidelines for workplace-based assessment, including multi-source feedback, and the Year 1 Oral/Medical Microbiology and Virology Assessment.
• regulations and guidelines for the Fellowship examinations
• access to e-learning mapped to the medical microbiology and virology curriculum
• an online training portfolio (login required)
• Annual Review of Competence Progression (ARCP)
All examinations and assessments undertaken during training will be clearly linked to the content of the curriculum, and their reliability and validity will work towards complying with the PMETB's *Principles for an Assessment System for Postgraduate Medical Training*.

[1] The GMC has now taken over the functions of the PMETB.

Entry requirements

Entry to an Oral Microbiology training programme in the UK may follow the satisfactory completion of:

- a two year period of Training which may include a period of Foundation training (VT), but should also include a period of training in secondary care in an appropriate cognate specialty.
- the possession of the FDS, MFDS or MJDF of the UK Surgical Royal Colleges or an equivalent qualification
- candidates without FDS, MFDS or MJDF may be admitted to a programme but will normally be expected to possess an appropriate higher degree and/or to have had appropriate experience in a related discipline.

Duration of training

The Royal College of Pathologists anticipates that five years would normally be required to satisfactorily complete the oral microbiology curriculum to the required depth and breadth. However, in order to ensure flexibility, the College advises that the minimum duration of training is four years but that all provisional CCST dates should be set at five years in the first instance. The CCST in oral microbiology will be awarded on the recommendation of the local Postgraduate Dental Dean following:

• evidence of satisfactory completion of the requirements of the oral microbiology curriculum (including workplace based assessments) and the minimum training period
• satisfactory outcomes in the requisite number of workplace-based assessments (including multi-source feedback)
• attainment of FRCPath by examination in oral microbiology
• Successful outcome in the Annual Review of Competence Progression (ARCP) process as outlined in 'A Guide to Postgraduate Dental Specialty Training in the UK' (Dental Gold Guide).

Flexible training

'Less than full time' is the term used to describe dentists undertaking training on a flexible basis, normally between five and eight sessions per week. The aim of flexible training is to provide opportunities for dentists in the NHS who are unable to work full time. Dentists can apply for flexible training if they can provide evidence that "training on a full-time basis would not be practicable for well-founded individual reasons".

Flexible trainees must accept two important principles outlined in European Law (Directive 93/16/EC):
• part-time training shall meet the same requirements (in depth and breadth) as full-time training
• the total duration and quality of part-time training of specialists must be not less than those of a full-time trainee. In other words, a part time trainee will have to complete the minimum training time for their specialty *pro rata*.

For SpRs, the regulations governing flexible training are outlined in the Dental Gold Guide.

Trainees must have their flexible training approved by the local Associate Postgraduate Dean for Less than full time Training before beginning their flexible training. The local Postgraduate Dental Dean may seek advice from the SAC with regard to the amended length of training

Research

Some trainees may wish to spend a period of time in research, either before entering Oral Microbiology training or as 'Out-of-Programme Experience' (OoPE) after entering a training programme. Within the oral microbiology curriculum during stages B-D it is expected that the trainee will undertake a research project relevant to oral microbiology with a minimum duration of three months.

Research undertaken prior to entry to an oral microbiology training programme
Trainees who have undertaken a period of research that includes clinical or laboratory work directly relevant to the oral microbiology curriculum prior to entering an oral microbiology training programme, can have this period recognised towards their CCST.

Research undertaken after entry to a medical microbiology or virology training programme
Trainees who have undertaken a period of research that includes *clinical work directly relevant to the Oral Microbiology curriculum*, after entering the training programme, can have a maximum of one year approved by the SAC towards their CCST. Such trainees should normally apply for approval of this period of research at the commencement of training. In accrediting any prior research towards the award of a CCST the outcomes achieved previously will be mapped across onto those stated in the curriculum. Following completion of at least six months (whole-time equivalent) of training the trainee's educational supervisor should assess their progress to determine the suitability of their previous period of research to be counted towards the CCST. Any period of research to be counted towards the CCST should be agreed by the Programme Director, who will make a recommendation to the SAC.

Trainees must have their OoPE research approved by their Postgraduate Dental Dean before beginning their research. The postgraduate dean may seek advice from the SAC with regard to the OoPE request.

1.1 Out of Programme Experience elsewhere in the UK or overseas

Some trainees who have been awarded an NTN may wish to spend a period of training in another UK or overseas Institution as OoPE after entering Oral Microbiology training programme. It is recommended that trainees wishing to undertake overseas training as OoPE do so after

completing a minimum of 2 years of training and after successfully passing the FRCPath Part I examination. Normally, the experience to be gained in their OoPe program will not be available in their own unit but is essential for the completion of training.

Clinical training

Related clinical training

During their Oral Microbiology training, some trainees may wish to spend a period of training in a related clinical specialty. This is acceptable and should be undertaken as OoPE. However, such a period of training – although useful to the individual trainee in broadening their knowledge of the relationship between Oral Microbiology and the clinical specialties, – will not be approved by the SAC towards the requirements of the CCST. This training experience may lengthen the time taken to achieve a CCST.

RATIONALE

Purpose of the curriculum

The purpose of the curriculum for specialist training in *Oral Microbiology* is to set the standards required by the GDC for attainment of the award of the Certificate of Completion of Specialist Training (CCST) in Oral Microbiology, and to ensure that trainees are fully competent to provide a high quality service at specialist level.

The educational programme provides:
• a broad knowledge of the diagnosis and management of infectious disease from a clinical and laboratory perspective
• the diagnostic techniques required in the practice of clinical microbiology
• knowledge of the areas of clinical microbiology detailed in the curriculum
• knowledge of specialist areas for medical and oral microbiology - infection control, virology, mycology, parasitology, public health and oral diseases level depending on the background and career aspirations of the trainee and the ability to provide a specialist opinion.
• the communication skills required for the practice of clinical microbiology and medical virology and the teaching skills necessary for effective practice
• the acquisition of management skills required in the running of the microbiology laboratory
• knowledge of the health protection aspects of clinical microbiology.
• experience of research and development projects and critical assessment of published work so as to contribute in a team and individually to the development of the service
• the acquisition of life-long habits of reading, literature searches, consultation with colleagues, attendance at scientific meetings, and the

presentation of scientific work that are essential for continuing professional development (CPD)
• experience of the practice of clinical governance and audit (specialist and multidisciplinary) through evaluation of practice against the standards of evidence-based healthcare, which underpin medical microbiology practice.
The balance between practical laboratory and clinical training will be influenced by educational background, personal interests and guidance from supervisors.

Clinical governance is defined by the Department of Health as, "a framework through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care, by creating an environment in which excellence in clinical care will flourish." In oral microbiology, trainees must acquire knowledge of the lines of accountability, quality improvement programmes, clinical audit, evidence-based practice, clinical standards and guidelines, managing risk and quality assurance programmes. Training in these areas must continue throughout all stages of the curriculum. Trainees must be aware of the professional guidance issued by the General Dental Council in their document *Standards for Dental Professionals*, and by the Senate of Dental Specialties in *Good Practice in the Dental Specialties.*
The award of the CCST will indicate suitability for independent professional practice as a Specialist. During training, trainees will be able to use the curriculum to monitor their progress towards this goal. Formal assessments and examinations will be based on curricular objectives. The curriculum will facilitate regular assessment of trainees' progress by trainees and their trainers.

Curriculum development

This curriculum was developed by the Oral Microbiology Subcommittee of the Specialty Advisory Committee in the Additional Dental Specialties, with input from the Medical Microbiology CATT, the Examination Panel of The Royal College of Pathologists and the Association of Clinical Oral Microbiologists. All trainers and trainees were consulted and invited to comment on the content of the curriculum.
The curriculum will allow trainees to take control of their own learning and to measure achievement against objectives. It will help in formulation of a regularly updated education plan in conjunction with an educational supervisor and the local Specialty Training Committee (STC).
The curriculum was agreed by the Medical Microbiology CATT and approved by the Council of The Royal College of Pathologists.

Stages of training and learning

There are four stages in the oral microbiology curriculum. Trainees may not progress to the next stage of training until they have satisfactorily completed the preceding stage.

Stage A

The trainee has a comprehensive knowledge of the principles and practices of clinical microbiology and virology under direct supervision. Stage A of training is 12 months whole-time equivalent. This stage of the curriculum (see page ?) will begin with a formal introduction to the basic principles of medical microbiology and virology. Following the induction period, the trainee will receive instruction and practical experience in

further aspects of medical microbiology and virology. This stage of training will be formally assessed by The Royal College of Pathologists' Year 1 Medical Microbiology and Virology Assessment.
In order to satisfactorily complete stage A of oral microbiology training, trainees must have:
• satisfactorily completed stage A of the medical microbiology and virology curriculum and a minimum training period of 12 months (wholetime equivalent)
• achieved satisfactory outcomes in the requisite number of medical microbiology workplace-based assessments
• undertaken a multi-source feedback assessment
• performed satisfactorily in The Royal College of Pathologists' Year 1 Medical Microbiology and Virology Assessment
• obtained a satisfactory outcome in the ARCP process.
Upon satisfactory completion of Stage A, trainees will then either undertake the oral/medical microbiology training programme.

Stage B
The trainee has a good general knowledge and can describe most principles and practices under indirect supervision. He/she should be able to deal with most of the day-to-day issues in a hospital microbiology or virology laboratory to an adequate level but will still require consultant input with regard to complex management and clinical issues.
Stage B of training is between month 13 and month 36 of whole-time equivalent training. During Stage B of training, the trainee will continue to broaden their experience and knowledge of oral and medical microbiology. The knowledge gained during this stage of training will be assessed by the FRCPath Part 1 examination.
In order to complete stage B of oral microbiology training, trainees must have:
• Satisfactorily completed a total of at least 24 months of training (whole-time equivalent) from entry onto the programme of which at least 12 months should be in Stage B. Some trainees may not need the full period of 13 to 36 months to complete stage B successfully.
• achieved satisfactory outcomes in the requisite number of medical microbiology and oral microbiology workplace-based assessments
• passed the FRCPath Part 1 examination in medical microbiology.
• Evidence of competence and progression as reviewed in the ARCP process.

Stage C
Stage C of training is between month 25 and month 48 of whole-time equivalent training. This stage of the curriculum enables the trainee to undertake further specialised general medical and oral microbiology training. This stage of training will in part be summatively assessed by the FRCPath Part 2 examination.
In order to complete stage C of oral microbiology training, trainees must have:
• satisfactorily completed a total of at least 42 months of training (whole-time equivalent) of which at least 12 months should be in Stage C
• achieved satisfactory outcomes in the requisite number of medical microbiology and oral microbiology workplace-based assessments
• passed the FRCPath Part 2 examination in medical microbiology
• obtained one or more satisfactory outcomes in the ARCP process to indicate satisfactory progress in training.

Stage D

Stage D of training is between month 43 and month 60 of whole-time equivalent training. The ARCP process undertaken at the end of Stage C should identify goals for the trainee to achieve during their final year of training. The trainee has an in-depth knowledge and can describe the principles of medical and oral microbiology. He/she should be competent to discuss and deal with the subject (or, where appropriate, perform the task/procedure), demonstrating a level of clinical or professional judgement commensurate with independent professional practice at specialist level. It is anticipated that a trainee at this level should have consultant input readily available at all times where required. By the end of Stage D, the trainee should be able to demonstrate a level of knowledge and skill indicating suitability for independent professional practice in clinical microbiology.

In order to complete stage D of oral microbiology training, trainees must have:

- satisfactorily completed a total of at least 60 months of training (whole-time equivalent) of which at least 12 months should be in Stage D
- achieved satisfactory outcomes in the requisite number of medical microbiology and oral microbiology workplace-based assessments
- satisfactorily completed all areas of the oral microbiology curriculum
- Successful outcome in the Annual Review of Competence Progression (ARCP) process as outlined in 'A Guide to Postgraduate Dental Specialty Training in the UK' (Dental Gold Guide).)

In addition to the above, trainees will also be required to undertake a universal pathology focussed MSF assessment in year 3 and year 5 Depending on the trainees' individual progress the year 3 MSF will normally take place in either Stages B or C. The ST5 MSF will normally take place in Stage D.

Training programmes

Training programmes will be quality assured by the GDC and it's anticipated training posts and programmes will be recommended for approval by the relevant Postgraduate Deanery with input from The Royal College of Pathologists. The training period will begin with a formal introduction to laboratory aspects of microbiology and virology. There will also be an introduction to the management and organisational structures within which the microbiology and virology service operates. It will be important for trainees to understand, at an early stage, the pathology and public health environments on which the diagnosis, prevention and control of infection depends, and the multidisciplinary nature of this environment. Following the induction period, the trainee will receive instruction and practical experience in further aspects of bacteriology, virology, mycology and parasitology, both laboratory and clinical. The emphasis will be on acquiring basic microbiological and virological knowledge and practical bench skills in a routine laboratory and clinical setting.

During Stage B, the trainee will continue to broaden experience and description of common infectious problems and their management. The knowledge gained during this stage of training will be assessed by the FRCPath Part 1 examination. Oral microbiology trainees should normally undertake 6–12 months training in virology, at least one month of which should take place before the FRCPath Part 1 examination. The delivery of the virology training is a local matter. Oral microbiology trainees should in addition undertake at least one months training in

diagnostic oral microbiology. The delivery of the oral microbiology training is a local matter. The trainee entering Stage C of the training programme will have a sound theoretical and practical knowledge of microbiological practice but will not have had a great deal of unsupervised experience in applying that knowledge. Stage C (and D) of training is thus devoted to acquiring self-sufficiency in the specialty during this period. The oral microbiology trainee will be expected to have specific instruction in infection control and prevention (including in-depth knowledge relevant to dental practice), microbiology, virology, mycology, parasitology, epidemiology, public health/health protection medicine and oral microbiology. Experience of clinical microbiology training as it is practised in a District General Hospital (DGH) is a local matter. The structure and operation of the training programme is the responsibility of an STC, which will ensure that every trainee is provided with an appropriate range of educational experience to complete his or her training. The local Programme Director or Regional Specialty Advisor are responsible for the overall progress of the trainee and will ensure that the trainee satisfactorily covers the entire curriculum by the end of the programme. Each trainee should have an identified educational supervisor at every stage of their training. The educational supervisor is the consultant under whose direct supervision the trainee is working. A trainer is any person involved in training the trainee (e.g. consultant, clinical scientist, senior biomedical scientist [BMS]). A trainee may be trained by a number of trainers during their training.

CONTENT OF LEARNING

The curriculum details the level of knowledge and skill that a trainee should acquire to provide a high quality service at specialist level. The *Standards for Dental Professionals* and core content of the curriculum is outlined below.

Generic skills required for oral microbiology, in accordance with Standards for Dental Professionals

Core medical microbiology and virology curriculum (Stage A)

Core medical microbiology curriculum (Stages B–D)

1. Laboratory aspects of microbiology

2. Knowledge of health and safety

3. Clinical skills, including the diagnosis and management of:

• infection in the community
• healthcare associated infection including hospital-acquired and dental practice infection and prevention
• infection in immunocompromised patients including human immunodeficiency virus (HIV), transplantation and neutropenia
• infection in the Intensive Care Unit (ICU) and Special Care Baby Unit (SCBU), including sepsis
• outbreaks of infection in hospital and the community
• infection in the returning traveller
• sexually transmitted infection
• food- and water-borne infection
• paediatric infection
• infection in pregnancy.
• oral diseases

4. Specialist areas of microbiology

The trainee will acquire a working knowledge, with the opportunity to sub-specialise if required, in:
• virology (for microbiologists)
• health protection and epidemiology
• mycology
• parasitology.
• oral microbiology.

5. Communication and management issues in microbiology

The trainee will develop the clinical, scientific, technical, management, communication and leadership skills required to run a laboratory and deliver a high-quality clinical service. The curriculum outlines the knowledge, skills, behaviours and expertise that a trainee is expected to obtain in order to achieve the award of the CCST. It is expected that every trainee should undertake the core Stage A training and the core oral/medical microbiology training, but it is recognised that the order of learning and experience will differ according to the programme.
The Royal College of Pathologists is committed to supporting self-care, promoting well-being and community engagement, prevention and early intervention with services designed around the patient/service user rather than the needs of the patient/service user being forced to fit with the services offered. The following common core principles of self-care are therefore supported. These are:
Principle 1: Empower people who use services/patients to make informed choices to manage their condition and care needs more effectively
Principle 2: Communicate effectively to enable people who use services/patients to develop and gain confidence in their self care skills
Principle 3: Enable and support people who use services/patients to use technology to support self care
Principle 4: Enable and support people who use services/patients to develop skills in self care
Principle 5: Enable and support people who use services/patients to participate in service planning and to access support networks.
Further details are available in *Supporting People with Long Term Conditions to Self Care: A guide to developing local strategies and best practice* (2005).
On completion of the oral/medical microbiology training programme, the trainee must have acquired and be able to demonstrate:
• appropriate behaviours in order to be able to work as an independent professional practitioner in oral/medical microbiology
• good working relationships with colleagues and the appropriate communication skills required for the practice of oral/medical microbiology
• the knowledge, skills and behaviours to act in a professional manner at all times
• the knowledge, skills and behaviours to provide appropriate teaching and to participate in effective research to underpin oral/medical microbiology practice
• a description of the context, meaning and implementation of clinical governance
• a knowledge of the structure and organisation of the NHS
• the acquisition of management skills required for the running of an oral/medical microbiology laboratory

• familiarity with health and safety regulations, as applied to the work of an oral/medical microbiology department.

Purpose of assessment

The purpose of training as laid down by the GDC and the Royal College of Pathologists is to promote excellence in the practice of oral microbiology and to be responsible for maintaining standards through training, assessments, examinations and professional development. The purpose of the assessment system follows the guidelines of Royal College of Pathologists' and the principles laid down by the PMETB (*Principles for an assessment system for postgraduate medical training*):

• indicate suitability of choice at an early stage of the chosen career path
• indicate the capability and potential of a trainee through tests of applied knowledge and skill relevant to the specialty
• demonstrate readiness to progress to the next stage(s) of training having met the required standard of the previous stage
• provide feedback to the trainee about progress and learning needs
• support trainees to progress at their own pace by measuring a trainee's capacity to achieve competencies for their chosen career path
• help to identify trainees who should change direction or leave the specialty
• drive learning demonstrated through the acquisition of knowledge and skill
• enable the trainee to collect all necessary evidence for the ARCP process
• gain Fellowship of The Royal College of Pathologists
• provide evidence for the award of the CCST
• assure the public that the trainee is ready for unsupervised professional practice.

Methods of assessment

Trainees will be assessed in a number of different ways during their training. Satisfactory completion of all assessments and examinations will be monitored as part of the ARCP process and will be one of the criteria upon which eligibility to progress will be judged. A pass in the Year 1 Oral/Medical Microbiology and Virology Assessment and the FRCPath examinations are required as part of the eligibility criteria for the award of the CCST.

Year 1 Medical Microbiology and Virology Assessment
Trainees must pass the Year 1 Oral/Medical Microbiologyand Virology Assessment as one of the requirements for satisfactory completion of Stage A of training.

Workplace-based assessments
Trainees will be expected to undertake workplace-based assessment throughout the entire duration of their training in medical microbiology. These will comprise:

• Case-based discussion (CbD) (minimum of 6 satisfactory outcomes required per year)

• Directly observed practical skills (DOPS) (minimum of 6 satisfactory outcomes required per year for years ST1 and ST2; minimum of 4 satisfactory outcomes required per year for years ST3, ST4 and ST5)
• Evaluation of Clinical/Management Events (ECE) (minimum of 4 satisfactory outcomes required per year for years ST1 and ST2; minimum of 6 satisfactory outcomes required per year for years ST3, ST4 and ST5)
Further separate guidance is provided about the method and required frequencies of these assessments

FRCPath examination
The major assessments will occur during Stage B of training in the shape of the FRCPath Part 1 examination and summatively towards the end of Stage C of training in the shape of the FRCPath Part 2 examination.
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The results of workplace-based assessments and examinations are evaluated by the JCPT as part of their role in monitoring training. Examination results are evaluated after each session and an annual review of validity and reliability is undertaken and reported to the Examinations Committee.

Evidence of competence
Annual Review of Competence Progression
The ARCP process is an annual opportunity for evidence gathered by a trainee, relating to the trainee's progress in the training programme, to document the competences that are being gained. Evidence of competence will be judged based on a portfolio of documentation, culminating in an Educational Supervisors Structured Report.

Models of learning
There are three broad categories of learning which trainees employ throughout run-through training – instructionalist model, constructionist model and the social learning model. The models of learning can be applied to any stage of training in varying degrees. The majority of the curriculum will be delivered through work-based experiential learning, but the environment within the departments will encourage independent self-directed learning. It is the trainee's responsibility to seek opportunity for experiential learning. The rotations are also arranged in such a way that trainees have time available for participation in research projects as part of their training. The more academically inclined trainees will be encouraged to take time out from the training time to include a more sustained period of grant-funded research working towards an MSc or PhD.
Trainees have a service provision role and it is recognised that a large component of training can occur as an apprenticeship, provided appropriate supervision is available. Normally, 50–80% of training would be by in-service training. It should be with a readily available consultant, well supervised, with the appropriate content, have a broad exposure and include laboratory issues.
The environment within the department should encourage independent self-directed learning and make opportunities for relevant off-the-job education by making provision for attendance at local, national and, where appropriate, international meetings and courses. Independent self directed learning should be encouraged by providing reference text books. It is the trainee's responsibility to seek opportunity for experiential learning. The rotation should also be arranged in such a way that trainees have time available for participation in research projects as part of

their training. The more academically inclined trainees will be encouraged to take time out from the training time to include a more sustained period of grant-funded research working towards a higher degree.

LEARNING EXPERIENCES

The following teaching/learning methods within the following tables will be used to identify how individual objectives will be achieved.
A. Observation of, assisting and discussion with senior medical/dental staff.
B. Working under consultant supervision.
C. Task specific on the job training.
D. Observation of laboratory methods.
E. Discussion with clinical scientists and senior BMS staff.
F. Practical bench work.
G. Personal study.
H. Appropriate postgraduate education courses.
I. Tailored clinical experience.
J. Laboratory and clinical team and directorate meetings.
K. Discussion with Infection Control Nurses and/or a Consultant in Communicable Disease Control (CCDC)/CHP and/or Regional Epidemiologist (RE).
L. Attendance and participation at relevant Trust committees.
M. Attending training available through equipment and kit manufacturers.
N. Attending ward round and multidisciplinary team meetings and telephone advice to clinicians.
O. Teaching undergraduates and other health professionals.
P. Awareness of appropriate guidelines.
Q. Attending regional, national and international medical or scientific conferences.
R. Interaction with/attachment to specialist reference laboratories.
S. E-learning.

These appear on the tabulated curriculum to indicate learning methods against specific topics.

SUPERVISION AND FEEDBACK

Specialty training must be appropriately supervised by the senior dental, medical and scientific and nursing (infection control nurses) staff on a day-to day basis under the direction of a designated educational supervisor and a Specialist Training Committee that links to the appropriate Postgraduate Deanery.
Educational supervision is a fundamental conduit for delivering teaching and training in the NHS. It takes advantage of the experience, knowledge and skills of educational supervisors\trainers and their familiarity with clinical situations. It ensures interaction between an experienced clinician and a dentist/doctor in training. This is the desired link between the past and the future of medical practice, to guide and steer the learning process of the trainee. Clinical supervision is also vital to ensure patient safety and the high quality service of dentists in training.
The College expects all trainees reaching the end of their training to demonstrate competence in clinical supervision before the award of the CCST. The College also acknowledges that the process of gaining competence in supervision starts at an early stage in training with foundation dentists/doctors supervising dental/medical students and specialist registrars supervising more junior trainees.
The example provided by the educational supervisor is the most powerful influence upon the standards of conduct and practice of a trainee. In order to become an educational supervisor, a consultant must have significant experience in the specialty, a demonstrated interest in teaching and training, appropriate access to teaching resources, be involved in and liaise with the appropriate regional training committees, be involved in annual reviews and liaise closely with the College Regional Specialty Adviser. The deaneries organise extensive training programmes for educational supervisor's development. Educational supervisors are expected to keep up-to-date with developments in postgraduate medical training (e.g. by attending deanery and national training the trainer courses), have access to the support and advice of their senior colleagues regarding any issues related to teaching and training and to keep up-to-date with their own professional development.

Responsibilities of the educational supervisor

General:
• to ensure the trainee is sufficiently supported to give clinical advice. In the early stages of training, consultant input will be greater. With increasing experience, the trainee can be left alone providing their work/advice is reviewed at regular intervals. The aim is to prepare the trainee for independent practice as a Specialist. In order to satisfy the requirements for achieving FRCPath part 2 it is expected that the oral microbiology trainee will undertake clinical liason as outlined in the training modules A-D. The degree of supervision will depend on the trainees experience and assessment by the educational suervisors.
• to provide the trainee with sufficient learning aids such as access to computers, books, national/international guidelines and up-to-date journals
• to ensure that the trainee is keeping all relevant documentation in their portfolio and that the assignments are reviewed locally
• to aid the trainee in identifying the nature and depth required of the clinical areas indicated above
• to ensure that adequate time is provided to attend relevant courses and meetings, including the infection control committee, and to ensure that relevant clinical attachments are arranged in a timely fashion
• to provide support and guidance to the trainee for completion of the in-course assessments.
• Encourage trainee to become a member of learned societies, e.g. Association for Clinical Oral Microbiology, Hospital Infection Society and

Society for General Microbiology.
•To ensure that arrangements are made for the trainee to spend dedicated time on the benches.
• To ensure that the trainee is able to gain experience in all the areas listed. If this is not possible, arrangements for an attachment to another laboratory offering the specific technique should be arranged
• To prepare the trainee for independent medical authorisation of results in a step-wise fashion, according to seniority of the trainee
• To provide support and guidance to the trainee for completion of the in-course assessments
Specific:
• to ensure that all H&S documentation is up to date, especially pertaining to safe working and the prevention of infection in clinical laboratories.
• to facilitate the trainee's exposure to departmental and Trust infection control and health and safety committees
• to ensure the trainee has at least three months' protected project time. This should be in blocks of no shorter than a week at a time
• it should be determined in Stage A whether the trainee wishes to have time out of programme to complete a PhD/MD. If they do, the educational supervisor should ensure that the trainee has sufficient research experience/publications to enable them to apply for relevant fellowships. Advice on academic progression should be sought from the regional specialty advisor and the academic representative on the Microbiology CATT

MANAGING CURRICULUM IMPLEMENTATION

The curriculum outlines the minimum oral microbiology training requirements for delivery in a regional training programme. It guides trainers in the teaching methods required to deliver the curriculum and guides trainees in the learning and assessment methods required for satisfactory completion of training.

It is the responsibility of the Programme Director and their deanery, with the assistance of the regional Specialist Training Committee and supported by the Regional Speciality Advisor to ensure that the programme delivers the depth and breadth of oral/medical microbiology training outlined in the curriculum. The Programme Director must ensure that each post or attachment within the programme is approved by the Deanery and SAC.It is the responsibility of the SAC in Additional Dental Specialities with guidance from The Royal College of Pathologists to ensure training programmes across the UK are able to deliver a balanced programme of training.

It is the responsibility of the educational supervisor of a particular post or attachment within a programme to ensure that the training delivered in their post meets the requirements of the relevant section(s) of the curriculum. The educational supervisor must undertake regular educational appraisal with his/her trainee, at the beginning, middle and end of section of training, to ensure structured and goal-oriented delivery of training.

Trainees must register with the SAC in Additional Dental Specialities on appointment to an oral microbiology training programme.
It is the trainee's responsibility to familiarise him/herself with the curriculum and assessment requirements both for the satisfactory completion

of each stage of training and the award of the CCST. They must be familiar with all aspects of the assessment system; workplace based assessment including multi-source feedback, the Year 1 Medical Microbiology and Virology Assessment and the FRCPath examination. It is the trainee's responsibility to ensure that they apply in good time for any assessments and examinations that demand an application. Trainees must also make appropriate use of the online training portfolio and e-learning.

CURRICULUM REVIEW AND UPDATING

The curriculum will be evaluated and monitored by the SAC in Additional Dental Specialities with The Royal College of Pathologists as part of continuous feedback from STCs, Programme Directors, trainers and trainees.

EQUALITY AND DIVERSITY

Extract from The Royal College of Pathologists' *Diversity and equality policy and approach* (December 2006):
The Royal College of Pathologists is committed to the principle of diversity and equality in employment, membership, academic activities, examinations and training. As part of this commitment we are concerned to inspire and support all those who work with us directly and indirectly.
Integral to our approach is the emphasis we place on our belief that everyone should be treated in a fair, open and honest manner. Our approach is a comprehensive one and reflects all areas, of diversity, recognising the value of each individual. We aim to ensure that no one is treated less favourably than another on the grounds of ethnic origin, nationality, age, disability, gender, sexual orientation, race or religion. Our intention is to reflect not only the letter but also the spirit of equality legislation.
Our policy will take account of current equality legislation and good practice. Key legislation includes:
• The Race Relations Act 1976 and the Race Relations Amendment Act (RRAA) 2000
• The Disability Discrimination Act 1995 and subsequent amendments
• The Sex Discrimination Act 1975 and 1986 and the 1983 and 1986 Regulations
• The Equal Pay Act 1970 and the Equal Pay (Amendment) Regulations 1983 and 1986
• The Human Rights Act 1998
• The Employment and Equality (Sexual Orientation) Regulations 2003
• The Employment and Equality (Religion or Belief) Regulations 2003
• Gender Recognition Act 2004
• The Employment Equality (Age) Regulations 2006.
• The Equality Act 2010

The Training and Educational Standards Department collects information about the gender and ethnicity of trainees as part of their registration with the College. This information is recorded by the College and statistics published on an annual basis in the annual report. Further

information about the monitoring activities of the College trainees, candidates, members are available in the College policy.

ACKNOWLEDGEMENTS

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GOOD CLINICAL PRACTICE CURRICULUM FOR ORAL MICROBIOLOGY

This section outlines the generic knowledge, skills and behaviours that are tailored to and required for specialist training in clinical microbiology and the competencies acquired in relation to the practice of clinical microbiology. It is intended that trainees follow this curriculum for their entire training period in oral/medical microbiology. This section will be complemented by training and courses organised by the local Deanery holding the trainee NTN. It is the responsibility of the educational supervisor to liaise with the local Programme Director and the Postgraduate Dean to ensure that the trainee has access to the necessary training opportunities, including attendance at courses to enable them to acquire the competencies as outlined in this curriculum.

1. GOOD CLINICAL CARE

Objective: to demonstrate adequate knowledge and skills and appropriate behaviours in routine clinical work.
New specialists will:

- have the breadth of knowledge and skills to take responsibility for safe clinical decisions
- have the self-awareness to acknowledge where the limits of their competence lie and when it is appropriate to refer to other senior colleagues for advice
- have the potential (or the ability) to take responsibility for clinical governance activities, risk management and audit in order to improve the quality of service provision.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Patient medical (or clinical) history	Define the patterns of symptoms found in patients presenting with infection.	Take and analyse a clinical history in a relevant succinct and logical manner. Communicate with people with language difficulties associated with physical and mental impairment. Use interpreters and advocates appropriately.	Show empathy with patients. Appreciate the importance of psychological factors for patients and relatives. Appreciate the interaction of social factors and the patient's illness.	ABCGHINP	CbD DOPs MSF

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Examination	Define the pathophysiological basis of physical signs. Define the clinical signs found in infectious diseases.	Perform a reliable and appropriate clinical examination.	Respect patients' dignity and confidentiality. Acknowledge cultural issues. Appropriately involve relatives. Appreciate situations where there is the need for a chaperone.	ABCGHINP	CbD DOPs MSF
Investigations including imaging	Define the pathophysiological basis of investigations. Define the indications for investigations. Define the risks and benefits of investigations. Know the clinical and cost effectiveness of individual investigation.	Start appropriate investigations Interpret the results of investigations. Perform appropriate clinical investigations competently where relevant. Liaise and discuss investigations with colleagues and to advise them appropriately	Describe the importance of working with other healthcare professionals and team working. Be able to provide explanations to patients as to rationale for investigations, and possible unwanted effects.	ABCGHINP	CbD DOPs MSF FRCPath examinations
Treatment (therapeutics)	Know the scientific theory relating to pharmacology and the pathophysiology of therapeutic interventions for infection.	Assess accurately the patient's needs.	Clearly and openly explain treatments and side effects of drugs.	ABCGHINP	CbD DOPs MSF FRCPath examinations

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Note-keeping, letters, etc.	Write summaries, letters, medicolegal reports. Define the structure, function and legal implications of medical records and medico-legal reports. Describe the relevance of the Data Protection Act pertaining to patient confidentiality.	Record concisely, accurately, confidentially and legibly the appropriate elements of the history, examination, results of investigations, differential diagnosis and management plan. Write summaries, letters, medico-legal reports. Date and sign all records.	Appreciate the importance of timely dictation, cost effective use of medical secretaries and the growing use of electronic communication. Be aware of the need for prompt and accurate communication with primary care and other agencies and patients or their families. Show courtesy towards medical secretaries and clerical staff.	ABCGHINP	CbD DOPs MSF
Management of chronic disease	Define the clinical presentation and natural history of chronic infections.	Maintain hope whilst setting long term realistic goals. Develop long-term management plans for control of chronic infection.	Treat each patient as an individual. Appreciate the effects of chronic disease states on patients and their relatives. Appreciate the importance of co-operation with primary care.	ABCGHINP	CbD DOPs MSF
Time management	Explain which patients/tasks take priority.	Start with the most important tasks. Work more efficiently as clinical skills develop. Recognise when he/she is falling behind and re-prioritise or call for help.	Have realistic expectations of tasks to be completed by self and others. Willingness to consult and work as part of a team.	ABCGHINP	CbD DOPs MSF
Decision making	State clinical priorities for investigation and management.	Analyse and advise on clinical infection problems.	Be flexible and willing to change in the light of changing conditions. Be willing to ask for help.	ABCGHINP	CbD DOPs MSF

Health determinants and inequalities

Subject	**Knowledge**	**Skills**	**Behaviours**	Teaching and learning methods	Assessment
Nationality and culture	Recognise that good health includes both mental and physical health • Recognise the relationship between health inequalities and wealth inequalities • Be aware of social and cultural issues and practices such as: – The impact of cultural beliefs and practices on health outcomes – Health determinants that affect patients and communities – The effects of social and cultural issues on access to healthcare, including a description of health issues of migrants and refugees • Be aware of the national and international situation regarding the distribution of disease, the factors that determine health and disease, and major population health responses • Be aware of the impact of globalisation on health, major causes of global morbidity and mortality, and effective and affordable interventions to reduce these • Be aware of the impact on health of armed conflict, natural disasters and other social upheavals.	• Communicate effectively with patients from diverse backgrounds and those with special communication needs, such as the need for interpreters etc • Communicate effectively and respectfully with parents, carers etc.	Recognise issues of health that are related to social class and social class	**ABCGHINP**	CbD DOPs MSF

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Inequality and discrimination/ stigmatising	• Describe the implications of disability discrimination legislation for healthcare • Recognise how health systems can discriminate against patients from diverse backgrounds, and how to work to minimise this discrimination. For example in respect of age, gender, race, culture, disability, spirituality, religion, and sexuality • Recognise the stigmatising effects of some illnesses and work to help in overcoming stigma • Recognise that people can be denied employment opportunities unnecessarily through myths, stigma, dogma and insufficient advocacy and support; be aware of the role of dentists/doctors and other services in combating this inequality • Recognise the effects of exclusion and discrimination on physical and mental health • Be aware of the role that individuals (including patients and carers as well as healthcare professionals) and services can play in combating inequality and discrimination and contribute appropriately to this work.	• Respect diversity and recognise the benefits it may bring, as well as associated stigma • Take account of socio-economic status, household poverty, employment status and social capital in taking a medical history • Assess the patient's ability to access various services in the health and social system and offer appropriate assistance • Help to empower patients and negotiate complex systems to improve health and welfare including, where appropriate, the right to work • Where values and perceptions of health and health promotion conflict, facilitate balanced and mutually respectful decision-making • Identify and communicate effectively with influential decision-makers/ facilitators of change.	• Respect diversity of status and values in patients and colleagues • Adopt assessments and interventions that are inclusive, respectful of diversity and patient-centred.	ABCGHINP	CbD DOPs MSF

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Personal beliefs and biases	• Recognise that personal beliefs and biases exist and describe their impact (positive and negative) on the delivery of health services • Be aware of similarities and distinctions between the beliefs and values of the dentist/doctor, the patient and the policy-makers.	• Recognise in routine practice the dentist's role as advocate and manager • Advocate and facilitate appropriate self-care • Recognise and be able to address the social, biological and environmental determinants of health (the bio-psycho- social model or the bio-socio- psycho-existentialist model), and collaborate with other professionals	• Be confident and positive in one's own professional values • Accept uncertainty • Be aware of one's own behaviour and how it might impact on patients' health issues	ABCGHINP	CbD DOPs MSF
Values, ethics and law	• Ensure that all decisions and actions are in the best interests of the patient and the public good • Be familiar with and uphold the rights of children and vulnerable adults • Be familiar with and uphold the rights of disabled people to participate in healthy and rewarding employment • Practise in accordance with an appropriate knowledge of contemporary legislation • Act with appropriate professional and ethical conduct in challenging situations.	• Seek out and utilise opportunities for health promotion and disease prevention • be able to apply epidemiological principles and public health approaches so as to reduce and prevent disease and improve the health of populations • Recognise important issues in preventative healthcare, for example in sexual health, substance abuse etc, and take opportunities to raise these issues in health promotion. For example, explain to parents who smoke the health risk that this poses to their children, including those exposed to the effects of smoking in *utero*.	• Respond to people in an ethical, honest, and non-judgmental manner • Use appropriate methods of ethical reasoning to come to a balanced decision where complex and conflicting issues are involved	ABCGHINP	CbD DOPs MSF

Subject	**Knowledge**	**Skills**	**Behaviours**	Teaching and learning methods	Assessment
Policy, research and change	• Be aware of current UK screening, immunisation and reporting programmes that relate to infection • Be aware of issues that might affect health inequalities that are currently under debate regarding changes in the NHS, including the public policy process • Be aware of and maintain an up to date knowledge of research evidence regarding the most important determinants of health • Know how to access and use local health data • Know how to access resources for community action and advocacy (e.g. resources, legislation, policy documents).	• Be able to access and make use of appropriate population, demographic, socio-economic and health data • Conduct an assessment of community health needs, and where appropriate apply these in practice.		**ABCGHINP**	CbD DOPs MSF

2. MAINTAINING GOOD CLINICAL PRACTICE

Objective: to keep knowledge and skills and appropriate Behaviours up to date.

New specialists will:

• take responsibility for and keep up-to-date in their own relevant professional and self-development, and facilitate that of others

• acknowledge that the balance of their skills and expertise will change as their careers progress and they specialise in certain areas of clinical practice.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Overall clinical judgement	Possess sufficient clinical and microbiological and virological knowledge to enable integration of clinical and laboratory features.	Iterpret correctly test results in the context of available clinical information.	Willingness to use the available clinical and laboratory data in coming to diagnostic/treatment decisions.	ABCDEFGHINP	CbD DOPs MSF
Recognise own limitations	Know the extent of one's own limitations and know when to ask for advice.		Willingness to ask for advice and to admit mistakes.	ABCDEFGHINP	CbD DOPs MSF
Written records	Describe the appropriate content of clinical records. Explain the problems faced by people for whom English is not a first language. Explain the problems faced by people with educational and/or physical disabilities. Describe the relevance of data protection pertaining to patient confidentiality.	Produce accurate letters/reports and other written correspondence with clear conclusions.	Willingness to ask medical secretaries and electronic communication to communicate in an appropriate manner. Willingness to communicate promptly and accurately with clinicians and patients and their families. Show courtesy towards medical secretaries and clerical staff.	ABCGHINP	CbD DOPs MSF

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Decision making	Know the clinical priorities for investigation and management.	Analyse clinical and laboratory problems effectively.	Be flexible and willing to change in the light of changing conditions. Be willing to ask for help.	ABCEGHINP	CbD DOPs MSF
Lifelong learning	Know the importance of continuing professional development.	Recognise and use learning opportunities. Use the potential of study leave to keep one up to date. Produce a professional portfolio. Be able to collect information efficiently from a range of sources including paper-based, computer-based and audiovisual Monitor own performance through audit and feedback.	Be self-motivated and eager to learn. Show willingness to learn from colleagues and to accept constructive feedback.	ABCGHINP	CbD DOPs MSF
Good use of information technology (IT)	Demonstrate how to use email, internet, fax and the telephone appropriately. Describe the principles of how to retrieve and utilize data recorded in clinical systems.	Perform competent use of database, word processing and statistics programmes. Perform searches (including literature searches) and access websites and health related databases. Apply the principles of	Demonstrate the acquisition of new Behaviours in patient consultation in order to make maximum use of IT. Be able to share information on computer with the patient in a constructive manner. Adopt proactive and enquiring attitude to new technology.	ABCGHINP	CbD DOPs MSF

	Demonstrate the principles of literature searching using medical databases. Explain the range of possible uses for clinical data and information and appreciate the dangers and benefits of aggregating clinical data. Demonstrate the main features, responsibilities and liabilities in the UK and Europe pertaining to confidentiality.	confidentiality in the context of IT.			

Objective	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
The organisational framework for clinical governance and its application in practice	Describe the important aspects of clinical governance: • medical and clinical audit • research and development • integrated care pathways • evidence-based practice • clinical effectiveness • clinical risk systems • to define the	Be an active participant in clinical governance. Produce medical and clinical audit. Be actively involved in audit cycles. Be active in research and development. Critically appraise medical data research. Practise evidence-based medicine. Aim for clinical effectiveness	Describe the important aspects of clinical governance: • medical and clinical audit • research and development • integrated care pathways • evidence-based practice • clinical effectiveness • clinical risk systems • to define the procedures and the effective action when things go wrong in one's own practice or that of others • complaints procedures • risk assessments. Describe the benefits a patient might	ABCGHINP	CbD DOPs MSF FRCpath examinations

	procedures and the effective action when things go wrong in one's own practice or that of others • complaints procedures • risk assessments. Describe the benefits a patient might reasonably expect from clinical governance.	(best practice) at all times. Educate self, colleagues and other healthcare professionals. Deal with complaints in a focused and constructive manner. Learn from complaints. Report critical incidents. Take appropriate action if you suspect you or a colleague may not be fit to practice. Develop and institute clinical guidelines and integrated career pathways.	reasonably expect from clinical governance.		

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Risk management	Explain about health and safety policy, policies on needle stick injuries, note keeping, communications and staffing numbers, in relation to risk. Describe risk management issues pertinent to laboratory processing. Describe about risk assessment, perception and relative risk. Explain the complications and side effects of treatments and investigations.	Confidently and authoritatively discuss relevant risks with patients and to obtain informed consent. Assess risks and benefits with patients and colleagues.	Respect and accept patients' views and choices. Be truthful and to admit error to patients, relatives and colleagues.	ABCEGHIJK NP	CbD DOPs MSF Part II FRCpath
Evidence	Describe: • the principles of evidence-based medicine ♦ types of clinical trial ♦ types of evidence.	Critically appraise evidence. Be competent in the use of databases, libraries and the internet. Discuss the relevance of evidence with individual patients or their families.	Display a keenness to use evidence in the support of patient care and own decisions therein.	ABCEGHIJK NPS	CbD DOPs MSF
Clinical audit	Describe how to use the audit cycle, data sources and data confidentiality. Describe the principles of internal and external quality	Analyse and produce results in ongoing audit. Demonstrate the ability to undertake clinical audit, normally by performing at least one clinical audit project per	Consider the relevance of clinical audit to benefit patient care and individual performance (i.e. to clinical governance).	ABCEGHIJK NP	CbD DOPs MSF

	assurance.	year.			

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Guidelines	Describe the advantages and disadvantages of guidelines.	Use guidelines. Produce guidelines with the help of others.	Show regard for individual patient needs when using guidelines. Show willingness to use guidelines as appropriate.	ABCEGHIJK NPS	CbD DOPs MSF FRCpath exams
Structure of the NHS and the principles of management	Describe the structure of the NHS in the relevant jurisdiction of the UK, including, Primary Care Trusts and Hospital Trusts, Health Boards and Authorities. Describe the local Trust's management structure (including chief executives, medical directors, clinical directors and the pathology laboratory). Describe about finance issues in general in the NHS, especially budgetary management and commissioning. Describe the importance of a health service for the population.	Demonstrate developing skills in managing change and managing people. Demonstrate developing interviewing techniques including those required for performance reviews. Contribute to the writing of a business plan.	Show an awareness of equity in healthcare access and delivery. Describe the importance of a health service for the population. Show respect for others, ensuring equal opportunities.	ABCEGHIJK LNP	MSF

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Relevance of outside bodies	Explain about the role and relevance to professional life of: • the medical royal colleges • Postgraduate Dean and deaneries • General Dental Council (GMC) • PMETB • Modernising Medical Careers (MMC) • British Dental Association (BMA) • defence unions • specialist societies. Describe about central government health regulatory agencies and their equivalents in different jurisdictions (e.g. National Institute for Health and Clinical Excellence [NICE], Care Quality Commission (CQC), NHS Quality Improvement Scotland, National Patient Safety Agency [NPSA]), health protection agencies, Veterinary Laboratories	Recognise situations when these bodies and individuals need to be involved .	Be open to constructive criticism. Accept professional regulation.	ABCEGHIJK LNP	MSF

	Agency).				
Media awareness	Describe about the importance of media awareness and public communications training and where to obtain it.	Recognise situations when it may be appropriate to implement such training and/or seek further advice from the Trust or other relevant parties e.g. public health specialists	Act professionally. Be willing to ask for help.	ABCEGHIJK LNP	MSF

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Planning	Describe: • The structure, financing, and operation of the NHS and its constituent organisations • Ethical and equality aspects relating to management and leadership e.g. approaches to use of resources/ rationing; approaches to involving the public and patients in decision-making • Business management principles: priority setting and a basic description of how to produce a business plan	Write and implement protocols & guidelines ?Analyse feedback and comments and integrate them into plans for the service	Demonstrate an awareness of equity in healthcare access and delivery	ABCEGHIJKLNP	MSF

	• The requirements of running of a department, unit or practice relevant to the specialty				

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Managing people	Describe: • Relevant legislation (e.g. Equality and Diversity, Health and Safety, Employment Law) and local Human Resource policies • The duties, rights and responsibilities of an employer, and of a co-worker (e.g. looking after occupational safety of fellow staff) • Individual performance review purpose, techniques and processes, including differences between appraisal, assessment and revalidation	Demonstrate the ability to: • Prepare rotas; delegate; organise and lead teams • Contribute to the recruitment and selection of staff • Contribute to staff development and training, including mentoring, supervision and appraisal.	Demonstrate: • A willingness to supervise the work of less experienced colleagues • Commitment to good communication whilst also inspiring confidence and trust	ABCEGHIJKLNP	MSF
Managing performance	Describe: • Organisational	Use and adhere to clinical	Respond constructively to the outcome of reviews, assessments or appraisals of performance		

	performance management techniques and processes • How complaints arise and how they are managed	guidelines and protocols, morbidity and mortality reporting systems, and complaints management systems Take steps to improve services following evaluation/performance management ?	Describe the needs and priorities of nonclinical staff		

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Identifying the contexts for change	Summarise: The responsibilities of the Executive Board members and Clinical Directors or leaders The function and responsibilities of national bodies such as DH, CQC, NICE, NPSA, NCAS; Royal Colleges and Faculties, specialty specific bodies, representative bodies; regulatory bodies; educational and training organisations	Discuss the local, national and UK health priorities and how they impact on the delivery of health care relevant to the specialty Identify trends, future options and strategy relevant to the specialty and delivering patient services	• Comply with national guidelines that influence healthcare provision • Willingly articulate strategic ideas and use effective influencing skills ?	ABCEGHIJKLNP	MSF
Applying knowledge and evidence	Describe: Patient outcome reporting systems within the	Compare and benchmark healthcare services	Evaluate issues and potential solutions before acting		

	specialty, and the organisation and how these relate to national programmes. Research methods and how to evaluate scientific publications including the use and limitations of different methodologies for collecting data	Use a broad range of scientific and policy publications relating to delivering healthcare services			
Making decisions	Describe: How decisions are made by individuals, teams and the organisation Effective communication strategies within organisations	Prepare properly for meetings - reading agendas, writing minutes, action points and undertaking background research on agenda items Work collegiately and collaboratively with a wide range of people outside the immediate clinical setting	Demonstrate: An appreciation of the importance of involving the public and communities in developing health services, Willingness to participate in decision making processes beyond the immediate clinical care setting		

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Evaluating impact	Explain: • Impact mapping of service change • Barriers to change • Qualitative methods to gather the experience of patients and carers	Evaluate outcomes and re-assess the solutions through research, audit and quality assurance activities Describe the wider impact of implementing change in healthcare provision and the potential for opportunity costs	Demonstrate a commitment to implementing proven improvements in clinical practice and services Obtain an adequate evidence base before declaring effectiveness of changes Adopt Behaviours and behaviours that assist dissemination of good practice	ABCEGHIJKLNP	MSF

3. TEACHING AND TRAINING, APPRAISING AND ASSESSING

Objective: to demonstrate the knowledge, skills and behaviours to provide appropriate teaching and to participate in effective research.
New specialists will:

- be able to demonstrate the potential to teach and train effectively at all levels of undergraduate and postgraduate education where required
- demonstrate skills and strategies in the process of feedback to colleagues and trainees, ensuring positive and constructive outcomes
- be capable of judging competence and professional attributes in others.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
To have the skills, behaviours and practices of a competent teacher	Describe how to identify adult learning principles. Describe how to identify learner needs. Outline how to structure a teaching activity. Explain varied teaching strategies. Describe how to identify learning styles. Describe principles of evaluation.	Facilitate learning process. Identify learning outcomes. Construct educational objectives. Design and deliver an effective teaching event. Communicate effectively with the learners. Use effective questioning techniques. Teach large and small groups effectively. Select and use appropriate teaching resources. To contribute to relevant teaching resources e.g. RCPath Pathopedia Give constructive effective feedback. Evaluate programmes and events. Use different media for teaching that are appropriate	Demonstrate a willingness and enthusiasm to teach. Show respect for the learner. Demonstrate a professional attitude towards teaching. Show commitment to teach. Demonstrate a learner centred approach to teaching.	ABCEGHIJK NPS	CbD DOPs MSF

		to the teaching setting.			

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
To be able to plan and analyse a research project	Describe the principles of performing a research study. Describe how to use appropriate statistical methods. Describe the principles of research ethics and the structure and function of local research ethics committees. Describe how to write a scientific paper.	Undertake systematic critical review of scientific literature. Ability to frame questions to be answered by a research project. Develop protocols and methods for research. Use databases. Accurately analyse data. Write a scientific paper.	Demonstrate curiosity and a critical spirit of enquiry. Ensure patient confidentiality. Demonstrate knowledge of the importance of ethical approval and patient consent for clinical research. Humility.	ABCDEFGH MQR	MSF
To be able to plan and analyse a research project (cont'd.)	Describe principles of research funding and how to obtain funding.	Have good written and verbal presentation skills.		ABCDEFGH MQR	MSF
Appraisal and assessment	Describe the concepts of appraisal and assessment. Conduct an appraisal interview or assessment.	Maintain an appraisal portfolio. Undertake an effective appraisal or assessment.	Demonstrate a positive attitude to appraisal. Be aware of equality and diversity issues as they relate to appraisal.	ABCEH	CbD DOPS MSF

4. RELATIONSHIPS WITH PATIENTS

Objective: to ensure that the trainee has the knowledge, skills and Behaviours to act in a professional manner at all times.
New specialists will:

- be skilled in building relationships of trust with patients and their families, through effective interpersonal skills, a courteous and compassionate approach, and respect for their privacy, dignity and cultural and religious beliefs
- follow the principles and legal aspects of consent and confidentiality
- be able to manage difficult and complex situations with patients and their families, to advise them appropriately and to manage complaints effectively.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Patient safety	Describe the issues around patient safety and the role of the NPSA. Describe the NPSA National Reporting and Learning System.	Demonstrate awareness of patient safety in a practical situation.	Show regard for patient safety.	ABCEGHIJK LNP	MSF
Continuity of care	Explain the relevance of continuity of care.	Ensure satisfactory completion of reasonable tasks at the end of the shift/day with appropriate handover. Ensure appropriate documentation of/for handover. Make adequate arrangements to cover leave.	Recognise the importance of punctuality and attention to detail. Recognise importance of communication with patients/carers	ABCEGHIJK LNP	MSF
Informed consent	Describe the process for gaining informed consent. Describe the principles of consent issues as relating to clinical practice and research. Describe how to gain consent for a research project.	Give appropriate information in a manner patients understand and be able to gain informed consent from patients. Demonstrate appropriate use of written material.	Respect for patients' and relatives' points of view and wishes. Consider the patient's needs as an individual.	ABCEGHIJK LNP	MSF

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Confidentiality	Describe relevant strategies to ensure confidentiality. Outline situations when confidentiality might be broken.	Use and share all information appropriately. Avoid discussing one patient in front of another. Be prepared to seek patient's wishes before disclosing information.	Respect the right to confidentiality.	ABCEGHIJK LNP	MSF
Within a consultation	Desmonstrate how to structure the interview to identify the patient's: • concerns/problem list/priorities • expectations • understanding acceptance.	Listen. Use 'open' questions followed by appropriate 'closed' questions. Avoid jargon and use familiar language. Communicate both verbally and in writing to patients whose first language may not be English in a manner that they understand. Use interpreters appropriately. Give clear information and feedback to patients and share information with relatives when appropriate Reassure 'worried well' patients.	Describe the need for: ♦ involving patients in decisions ♦ offering choices ♦ respecting patients' views ♦ dress and appearance that is appropriate to the clinical situation and patient.	ABCEGHIJK LNP	MSF

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Breaking bad news	Describe the local complaints procedures. Describe systems of independent review.	Manage dissatisfied patients/relatives. Anticipate potential problems.	Act promptly and with honesty and sensitivity. Be prepared to accept responsibility.	ABCEGHIJK LNP	MSF
Complaints	Explain all aspects of a professional relationship. Establish the limiting boundaries surrounding the consultation. Explain how to deal with challenging behaviour in patients that transgress those boundaries, e.g. aggression, violence, racism and sexual harassment.	Help the patient appreciate the importance of cooperation between patient and dentist/doctor. Develop the relationship that facilitates solutions to patient's problems. Deal appropriately with behaviour falling outside the boundary of the agreed clinician-patient relationship in patients, e.g. aggression, violence, sexual harassment.	Adopt a non-discriminatory attitude to all patients and recognise their needs as individuals. Seek to identify the healthcare belief of the patient. Acknowledge patient rights to accept or reject advice.	ABCEGHIJK LNP	MSF
Clinician-patient relationship	Describe the local complaints procedures. Describe systems of independent review.	Manage dissatisfied patients/relatives. Anticipate potential problems.	Act promptly and with honesty and sensitivity. Be prepared to accept responsibility.	ABCEGHIJK LNP	MSF

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Educating patients about: • disease • investigations • therapy	Outline procedures including possible alternatives and choices. Outline strategies to improve adherence to therapies.	Give information to patients clearly in a manner that they can understand, including written information. Encourage questions. Negotiate individual treatment plans including action to be taken if patient deteriorates or improves.	Consider involving patients in developing mutually acceptable investigation plans. Encourage patients to access: • further information • patient support groups.	ABCEGHIJK LNP	MSF
Environmental and lifestyle risk factors	Outline risk factors for disease including: • diet • exercise • social deprivation • occupation • substance abuse behaviour.	Advise on lifestyle changes. Involve other healthcare workers as appropriate.	Suppress any display of personal judgement.	ABCEGHIJK LNP	MSF
Epidemiology and screening	Describe the methods of data collection and their limitations. Formally notify diseases where this is required Apply principles of primary and secondary prevention and screening.	Assess an individual patient's risk factors. Encourage participation in appropriate disease prevention or screening programmes.	Consider the: 1. positive and negative aspects of prevention 2. importance of patient confidentiality. Respect patient choice.	ABCEGHIJK LNP	MSF

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Ensuring patient safety	Describe: Risk management issues pertinent to infection, potential sources of risk and risk management tools, techniques and protocols How healthcare governance influences patient care, research and educational activities at a local, regional and national level	Report clinical incidents Assess and analyse situations, services and facilities in order to minimise risk to patients and the public Monitor the quality of equipment and safety of environment relevant to the specialty	Demonstrate: Actively seeking advice/assistance whenever concerned about patient safety Willingness to take responsibility for clinical governance activities, risk management and audit in order to improve the quality of the service	ABCEGHIJKLNP	MSF
Critically evaluating	Describe: Quality improvement methodologies including a range of methods of obtaining feedback from patients, the public, and staff The principles and processes of evaluation, audit, research and development, clinical guidelines and standard setting in improving quality	Undertake an audit project Contribute to meetings which cover audit; critical incident reporting, patient outcomes.	Listen to and reflect on the views of patients and carers, Deal with complaints in a sensitive and co-operative manner Act as an advocate for the service	ABCEGHIJKLNP	MSF

Encouraging innovation	Apply a variety of methodologies for developing creative strategies for improving services	Question existing practice in order to improve services Apply creative thinking approaches (or methodologies or techniques) in order to propose solutions to service issues	Demonstrate: Being open minded to new ideas A proactive approach to new technologies and treatments Supporting colleagues to voice ideas	ABCEGHIJKLNP	MSF
Facilitating transformation	Outline: The implications of change on systems and people Project management Methodology	Demonstrate the ability to: Provide medical expertise in situations beyond those involving direct patient care Make effective written and verbal presentations	Demonstrate: Being positive about improvement and change Striving for continuing improvement in delivering patient care services		

5. WORKING WITH COLLEAGUES

Objective: to demonstrate good working relationships with colleagues and appropriate communication skills.

New specialists will:

• strive for continuing improvement in all aspects of their work and that of colleagues while mindful of priorities and high standards

• have effective interpersonal skills which enable them to bring out the best in colleagues, to resolve conflicts when they arise and to develop working relationships within the team

• Support teams that bring together different professions and disciplines and other agencies, to provide high quality healthcare.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Clinical teams	Describe how a team works effectively. Summarise the roles and responsibilities of team members, especially within the department and within multidisciplinary teams. Outline the roles of other clinical specialties Demonstrates knowledge of a wide range of leadership styles and approaches and the applicability to different situations and people	Communicate effectively and seek advice if unsure. Recognise when input from another specialty is required for individual patients. Work effectively with other health care professionals. Work in collaboration with external agencies to manage the potential for infection prevention and control within the wider community including communicating effectively with the general public and liaising with regional and national bodies where appropriate Respect skills and contribution of colleagues. Recognise and work within own limitations. Delegate appropriately Show leadership	Show respect for others' opinions. Be conscientious and work cooperatively. Respect colleagues, including non-medical professionals and recognise good advice. Recognise and work within own limitations. Demonstrate team approach and willingness to consult and work as part of a team	ABEHIJKLR	MSF

		Supervise safely.			

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Communication with colleagues	Communicate with other members of the pathology department, other departments, and other members of the multidisciplinary team Communicate appropriately in writing, through letters and reports Justify when and how best to contact to phone a general practitioner (GP) or other healthcare professional.	Use appropriate language. Select an appropriate communication method.	Be prompt and respond courteously and fairly.	ABEHIJKLR	MSF
Complaints	Have awareness of the local complaints procedures. Have an awareness of systems of independent review.	Anticipate potential problems. Manage dissatisfied colleagues.	Act with honesty and sensitivity and promptly. Be prepared to accept responsibility.	ABEHIJKLR	MSF
Interactions between: **• hospital and GP** **• hospital and other agencies, e.g. social services** **• medical and surgical specialties**	Explain the roles and responsibilities of team members. Describe how a team works effectively.	Delegate, show leadership and supervise safely Communicate effectively. Handover safely. Seek advice if unsure. Recognise when input from another specialty is required for individual patients. Work effectively with GPs, other medical and surgical	Show respect for others opinions. Be conscientious and work co-operatively. Respect colleagues, including non-medical professionals, and recognise good advice. Recognise and work within own limitations.	ABEHIJKLR	MSF

		specialists and other healthcare professionals.			

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Creating an environment in which mistakes and mismanagement of patients can be openly discussed and lessons learned		Be aware of the advantages and disadvantages of guidelines. Report and investigate critical incidents. Take appropriate action if you suspect you or a colleague may not be fit to practise.		ABEHIJKLR	MSF

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Self awareness	Describe: Ways in which individual behaviours impact on others; personality types, group dynamics, learning styles, leadership styles Methods of obtaining feedback from others	Maintain and routinely practice critical self awareness, including able to discuss strengths and weaknesses with supervisor, recognising external influences and changing behaviour accordingly Show awareness of and sensitivity to the way in which cultural and religious beliefs affect approaches and decisions, and respond respectfully	Adopt a patient-focused approach to decisions that acknowledges the right, values and strengths of patients and the public Recognise and show respect for diversity and differences in others	ABEHIJKLR	MSF

Self management	Appropriately apply tools and techniques for managing stress. Recognise the role and responsibility of occupational health and other support networks. Recognise the limitations of self professional competence	Recognise the manifestations of stress on self and others and know where and when to look for support Balance personal and professional roles and responsibilities. Prioritise tasks, having realistic expectations of what can be completed by self and others	Be conscientious, able to manage time and delegate Recognise personal health as an important issue		
Self development	Describe the local processes for dealing with and learning from clinical errors Acknowledge the importance of best practice, transparency and consistency	Use a reflective approach to practice with an ability to learn from previous experience Use assessment, appraisal, complaints and other feedback to professionally develop	Be prepared to accept responsibility Show commitment to continuing professional development which involves seeking training and self development opportunities, learning from colleagues and accepting constructive criticism		
Developing networks	Describe the role of team dynamics in the way a group, team or department functions Describe team structures and the structure, roles and responsibilities of the multidisciplinary teams within the broader health context relevant to the specialty, including other	Take on differing and complementary roles within the different communities of practice within which they work Support bringing together different professionals, disciplines, and other agencies, to provide high quality healthcare	Interact effectively with professionals in other disciplines and agencies Respect the skills and contributions of colleagues		

	agencies				
Building and maintaining relationships	Use specific techniques and methods that facilitate effective and empathic communication	Develop effective working relationships with colleagues and other staff through good communication skills , building rapport and articulating own view Communicate effectively in the resolution of conflicts, providing feedback, and identifying and rectifying team dysfunction	Recognise good advice and continuously promoting values based non prejudicial practice Use authority appropriately and assertively; willing to follow when necessary		
Encouraging contribution	Appropriately use facilitation and conflict resolution methods	Enable individuals, groups and agencies to implement plans and decisions Identify and prioritise tasks and responsibilities including to delegate and supervise safely.	Show recognition of a team approach and willingness to consult and work as part of a team Respect colleagues, including non-medical professionals.		
Identifying the contexts for change	Describe the responsibilities of the various Executive Board members and Clinical Directors or leaders Summarise the function and responsibilities of	Discuss the local, national and UK health priorities and how they impact on the delivery of health care relevant to the specialty Identify trends, future options and strategy	Comply with national guidelines that influence healthcare provision Be willing to articulate strategic ideas and use effective influencing skills		

	national bodies such as DH, CQC, NICE, NPSA, NCAS; Royal Colleges and Faculties, specialty specific bodies, representative bodies; regulatory bodies; educational and training organisations	relevant to the specialty and delivering patient services			
Applying knowledge and evidence	• Describe and correctly use the patient outcome reporting systems within the specialty, and the organisation and how these relate to national programmes. • Based on a description of research methods, evaluate scientific publications including the use and limitations of different methodologies for collecting data	• Compare and benchmark healthcare services • Use a broad range of scientific and policy publications relating to delivering healthcare services	• Evaluate issues and potential solutions before acting		

6. HEALTH

Objective: to describe the importance of the personal health of the dentist/doctor.
New specialists will:

• act quickly and effectively if they have reason to believe that their own or a colleague's conduct, performance or health may put patients at risk.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Personal health	Describe the use of occupational health services. Describe one's responsibilities to the public. Know not to treat oneself or one's family.	Recognise when personal health takes priority over work pressures and to be able to take the necessary time off.	Recognise personal health as an important issue.	AEHP	MSF
Stress	Describe the effects of stress. Describe support facilities for dentists/doctors.	Develop appropriate coping mechanisms for stress and ability to seek help if appropriate.	Recognise the manifestations of stress on self and others.	AEHP	MSF

7. PROBITY

Objective: to be able to demonstrate probity in all aspects of professional practice.

New specialists will:

- always act in their personal and professional lives to maintain public trust in the profession
- undertake duties such as writing reports, giving evidence and completing and signing documents in a timely, honest and conscientious way
- through their leadership encourage the development and practice of these qualities in their colleagues.

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Service information	Legal framework for advertisements.		Recognise absolute importance. of accuracy and impartiality.	AEHP	MSF
Writing reports and giving evidence			Honesty and integrity. Timeliness.	AEHP	MSF
Research		Obtain ethical approval.	Put safety and care of patients first. Conduct research with honesty and integrity.	AEHP	MSF
Financial dealings			Not induce patients to accept private medical care. Manage funds for the purpose for which they are intended.	AEHP	MSF

			Declare conflicts of interest.		

SPECIALTY-SPECIFIC ORAL/MEDICAL MICROBIOLOGY CURRICULUM (STAGE A)

For many trainees, this period of training represents their first exposure to laboratory medicine (microbiology and virology) and how it is applied to common microbiology and virology problems.
A formal period of instruction under supervision takes place at the beginning of this block and aims to provide an introduction to laboratory infection. This introductory period will last approximately three to four months and is designed to equip the trainee with the fundamental knowledge and skills for the practice of clinical microbiology and virology. Knowledge will also be acquired through attendance at regional courses and by self-directed learning. Skills will be acquired through a formal training programme supervised by educational supervisors.
The curriculum for this stage is divided into two sections:
• fundamental skills
• core knowledge.
Fundamental skills are essential to the practice of laboratory medicine (in this case in microbiology and virology) and provide the foundation on which to develop. By the end of this stage of training, the trainee should have reached a decision about the suitability of clinical microbiology as his or her career of choice.

1. FUNDAMENTAL SKILLS

Objective: To acquire sufficient knowledge of laboratory techniques to underpin clinical practice.
By the end of this stage, and before proceeding to Stage B of training, the trainee should:
• have gained a thorough knowledge of laboratory health and safety practice
• have gained experience in the safe handling of clinical samples in the laboratory
• have gained a basic understanding of quality assurance in the diagnostic laboratory
• have developed, under supervision, core reporting skills.
• have sufficient knowledge of microbiology, mycology, virology and parasitology to offer basic advice on the interpretation of laboratory results
• be able to manage common medical emergencies relevant to their clinical practice
• describe the importance of infectious disease notifications and the relationship of the laboratory with the local CCDC/CHP/Consultant in Public Health (CPH)
• describe the role of the CCDC/CHP and CPH
• be aware of national guidelines and where to find them (see separate documents for websites)

- function as part of a multidisciplinary team
- recognise critical incidents and start to understand how to manage them
- describe the importance of clinical audit and risk management.

2. CORE KNOWLEDGE

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

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Basic biology	Explain basic biology (structure, genetics, taxonomy, epidemiology) of major bacterial, viral, fungal and parasitic agents. Explain basics of the immune response to infection. Compare and contrast cellular and humoral immunity. Explain the basis of how vaccines work. Explain the basics of of molecular biology. Explain the basis of genetic susceptibility to pathogens and disease	Use knowledge of basic biology to justify investigations, infection prevention and control procedures and interpretation of results	Enthusiastic approach to learning and application of knowledge.	ACDEFGOQS	MSF Part 1 FRCpath
Laboratory safety	Explain basic laboratory hazards and precautions against them	Work safely in a laboratory.	Observe safe working practices	ACDEFG	MSF
ACDP classification	Explain principles of standard precautions,	Work safely in a laboratory at appropriate ACDP	Observe safe working practices	ACDEFG	MSF FRCPath

of pathogens	hazard groups and containment levels.	containment level.			exams

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Host pathogen relationships	Explain the basis of how the immune response protects against infection, and how it may contribute to pathogenesis of infectious diseases. Explain the basis of different types of host-parasite relationships, e.g. symbiosis, viral latency, quasispecies evolution, etc. Explain the types of immunodeficiency and how they affect susceptibility to and control of infectious diseases. Explain pathogenic mechanisms involved in infectious diseases and the role of host response in immunopathology.	Use knowledge of host pathogen relationships to analyse clinical presentation of infections and justify investigations and interpretations of results	Enthusiastic approach to learning and application of knowledge.	ACDEFGOQS	MSF Part 1 FRCpath
Standards of practice	Describe the importance and relevance of standards to good laboratory practice. Describe the evidence base behind standard		Establish a rapport with both laboratory and clinical staff. Observe safe working practices	ACDEFGOQS	MSF Part 1 FRCpath

	operating procedures (SOPs)/examination procedures (EPs) and the importance of audit and quality control to establish validity.				

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Basic principles of diagnostic microbiology and virology	Explain the range of tests available, and the circumstances in which they are used. Explain the difference between sterile and contaminated/colonised body sites Explain basic techniques for serodiagnosis in infectious diseases Explain nucleic acid-based detection system such as polymerase chain reaction (PCR) Explain simple antimicrobial and antiviral susceptibility testing and its interpretation Explain the basic principles behind drug monitoring and its uses.	Skills should include: Perform sample processing for simple microbiology and virology specimens according to SOPs/EPs. Identify common viral/microbial pathogens with confirmation of identity, and distinction between clinically significant and nonsignificant pathogens Perform simple antimicrobial and interpret the results	Establish close rapport and understanding with laboratory staff.	ACDEFGOQS	MSF Part 1 FRCpath

Objective	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment

Clinical syndromes – advice and management	Outline the principles of epidemiology, presentation, diagnosis and management of clinical syndromes: • 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 • inoculation incident • encephalitis/meningitis • brain abscess • 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 knowledge of how to make the diagnosis of infection and treatment options • deep infection (e.g.	Taking relevant basic clinical/infection history Manage (under supervision) of common clinical syndromes (see opposite)	Explain results and clinical management plans simply and effectively to both clinicians and patients..	ABCDEFGHI NPQRS	MSF CpD DOP FRCpath exams

	septicaemia, endocarditis, bone infection) • common nosocomial infection (e.g. device-associated infection) • infection in travellers (e.g. malaria) • community-acquired and nosocomial infections in which environmental factors play a role (eg, food, water, air)				

Objective	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Treatment and prevention strategies	Explain the range of therapies available for infectious disease, the clinical indications for their use and their side effects. Explain the classification of antimicrobial agents. Explain in detail the mechanism of action of aciclovir and betalactam antibiotic agents and mechanisms for development of resistance to these agents. Explain the basic principles of action and resistance for other antimicrobial agents, their uses and limitations. Explain the basic principles of prophylaxis, both with antimicrobials and with immune globulins. Describe existing vaccines and the schedules of	Use knowledge of treatment and prevention strategies in the management of clinical infection under supervision.	Enthusiastic approach to learning.	ABCDEFGHI NPQRS	MSF CpD DOP FRCpath exams

	immunisation.				
Infection control	Describe routes of transmission and methods of preventing nosocomial spread of common and important infecting organisms ('alert organisms'), including • meticillin-resistant and –sensitive *Staphylococcus aureus* • vancomycin-resistant enterococci • varicella zoster virus • enteric infections including viral diarrhoea • respiratory tract infections, including TB • blood-borne viruses • extended-spectrum beta-lactamase-producing organisms (ESBLs) • multiply-resistant *Acinetobacter baumanii* • *Clostridium difficile* - associated diarrhoea Describe issues surrounding the isolation of the febrile traveller. Describe the principles and practice of surveillance and public health with particular regard to food-borne and vaccinepreventable infections and STIs.	Use knowledge of infection prevention and control in the management of patients with infection.	Liaise effectively with Infection Prevention & Control Team and/or CCDC/CPHM and the clinicians and coordinate infection prevention and control and public health management of patients. Recognise the need for confidentiality.	ABCDEFGHI KNPQRS	MSF CpD DOP FRCpath exams

Objective	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Sterilisation and	Describe basic terms. Describe the basis of the		Enthusiastic approach to learning.	ABCDEFGHI	MSF

disinfection	different methods available. Describe the importance of removal of pathogenic organisms in the prevention of infection in: • pre-operative sterilisation • aseptic technique • decontamination of environmental sources.		Establish close rapport and understanding with laboratory staff. To liaise effectively with Infection Prevention & Control Team.	KNPQRS	CpD DOP FRCpath exams

SPECIALTY-SPECIFIC ORAL/MEDICAL MICROBIOLOGY CURRICULUM (STAGES B–D)

INTRODUCTION

This period of training in oral/medical microbiology will consist of consolidation of clinical and laboratory work started in Stage A up to consultant level. Flexibility at this stage will be encouraged to reflect the needs of the trainee and may additionally include modules such as virology, epidemiology, public health medicine, research, time in another laboratory, etc.

The precise composition of an individual training programme should be structured around the past experience and aspirations of each trainee and should set out educational objectives against which progress can be assessed. Programmes should identify how specific areas of training not covered by the departments involved will be obtained (e.g. secondment for experience in virology, communicable diseases/epidemiology, public health microbiology), together with any courses deemed necessary.

1. LABORATORY ASPECTS OF MICROBIOLOGY

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

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Description of appropriate staining and culture techniques	Describe microscopy, culture, and identification techniques for common pathogens.	Process all routine specimens received in the laboratory and carry out further tests necessary for full identification of pathogens.	Establishes close rapport and understanding with laboratory staff.	CDEFGS	DOPS MSF FRCPath exams
Antimicrobial susceptibility testing	Describe current techniques for susceptibility testing including Etest, broth dilution and automated methodologies with appropriate quality control.	Perform simple susceptibility tests. Provide clinical advice based on interpretation of the results of susceptibility testing. Analyse use and limitations of the antibiogram for outbreak investigation	Establishes close rapport and understanding with laboratory staff.	ABCDEFGHIP	DOPS MSF FRCPath exams

		and control.			

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Serologic and antigen-based techniques	Describe the basis and clinical interpretation of results of latex agglutination, enzyme-linked immunosorbent assay (ELISA), immunofluorescence, complement fixation test (CFT) and the various controls.	Perform simple serological tests. Provide clinical advice based on interpretation of the results of serology.	Establishes close rapport and understanding with laboratory staff.	ABCDEFGHIP	DOPS MSF FRCPath exams
Molecular diagnostic techniques	Describe the principles current clinically used of nucleic acid based techniques. Describe the selection of appropriate tests and their interpretation (advantages and limitations).	Provide clinical advice based on interpretation of the results of nucleic acid based techniques.	Establishes close rapport and understanding with laboratory staff. Includes reference lab staff where appropriate.	ABCDEFGHIMPR	DOPS MSF FRCPath exams
Automated and semi-automated methodologies in microbiology	Describe automated culture and identification methodologies.		Establishes close rapport and understanding with laboratory staff. Includes reference lab staff where appropriate.	ABCDEFGHIMPR	DOPS MSF FRCPath exams

Point-of-Care Testing	Describe the role of, clinical governance issues with and quality assurance of Point-of-Care Testing.		Establishes close rapport and understanding with laboratory staff. Includes reference lab staff where appropriate.	ABCDEFGHIMPR	DOPS MSF FRCPath exams
Typing methods available	Explain the principles, advantages and limitations of various phenotypic and genotypic methods. Describe the role of typing in incident/outbreak investigations.	Recommend appropriate typing methods for clinical situations and interpret the results.	Establishes close rapport and understanding with laboratory staff. Includes reference lab staff where appropriate.	ABCDEFGHIMPR	DOPS MSF FRCPath exams

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching and learning methods**	**Assessment**
Reference centres	Describe the indications for referral of specimens to reference facilities. Describe regulations for transportation of samples	Refer specimens to reference lab appropriately	Establishes rapport and understanding with laboratory staff.	ABCDEFGHIJP	DOPS MSF FRCPath exams
Principles of laboratory management External bodies/ Institutions relevant to service and their role	Describe the indications for referral of specimens to reference facilities. Describe regulations for transportation of samples	Team working Time management Decision making and prioritisation skills Negotiation skills managing underperformance	Establishes rapport and understanding with laboratory staff.	ABCDEFGHIJP	DOPS MSF FRCPath exams

	Explain: • 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 • wider organisational issues, e.g. pathology				

2. KNOWLEDGE OF HEALTH AND SAFETY

Objective:

• to obtain an in-depth knowledge 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 describe a risk assessment for dealing with category 3 and 4 pathogens and be familiar with the requirements for

handling of such pathogens.

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Health & Safety	Work within and brief others as necessary about the current legislative framework underpinning health and safety (H&S) at work, including: • Health and Safety at Work Act (1974) • Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) • Control of Substance Hazardous to Health (COSHH) Regulations • Genetically Modified Organisms (Contained Use) Regulations (2001) • Management of Health and Safety at Work Regulations (1999)	Perform an infection-prevention and 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.	Behaviours towards laboratory work should be in accord with the principles of good medical practice.	ABCDEFGHIKP	DOPS MSF FRCPath exams

3. 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:

3.1 Infection in the community.
3.2 Hospital-acquired infection and infection control and prevention.
3.3 Infection in immunocompromised patients including HIV, transplantation and neutropenia.
3.4 Infection in critical care and sepsis.

3.5 Outbreaks of infection in hospital and the community.
3.6 Infection in the returning traveller.
3.7 Food and water borne infection.
3.8 Sexually transmitted diseases.
3.9 Occupationally acquired disease.
3.10 Paediatric infection.
3.11 Infection in pregnancy.

3.1 Clinical microbiology – infection in the community

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Aetiology, pathophysiology and presentation of infectious diseases (including those outlined in Section 2 Core Knowledge; Subject Clinical Syndromes; Knowledge domain).	Explain aetiology and clinical presentation of infectious diseases (including those outlined in Section 2 Core Knowledge; Subject Clinical Syndromes; Knowledge domain). Explain pathophysiology of the disease process, with particular reference to common and important infections such as urinary tract infection and respiratory tract disease	Assimilate clinical, laboratory and epidemiological information and use this to differentiate between infections and other conditions. Select and interpret appropriate tests. Analyse data to produce specific or differential **diagnosis.**	Consideration of diagnostic issues. Establish a rapport between laboratory staff and community physicians. Readiness to review and revise diagnostic matrix.	ABCDEFGHI KNP	DOPS MSF CbD FRCPath exams

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Treatment of infections (including those outlined in Section 2 Core Knowledge; Subject Clinical Syndromes; Knowledge domain).	Explain the optimum treatment of infections and **how to access current guidelines**	Select the appropriate antimicrobial in the clinical setting. Liaise between clinicians and **laboratory.**	Collaboration with colleagues. Flexibility to respond to change in the context of the clinical situation.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Spread of infectious disease and its prevention	Explain the epidemiological consequences of different diseases and of the systems available for disease control with reference to: **tuberculosis (TB), viral hepatitides, genitourinary disease, immunisation strategies**	Make an accurate risk assessment. **Demonstrate when urgent action is required based on epidemiology.**	Cooperative working within a multidisciplinary team.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

3.2 Clinical microbiology – hospital-acquired infection and infection control and prevention

Objective: Describe specific infection problems related to hospital-acquired infections (HAIs).

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Sources and risk factors for the acquisition of HAIs	Describe the reservoirs, sources, routes of transmission and portals of entry of common HAIs Describe interactions between the microbe, the patient risk factors and others in the environment, e.g. device and antimicrobial exposure Explain importance of the colonised patient and infected or colonised staff **Describe the epidemiology and control of common and important multi-resistant organisms, e.g. meticillin-resistant *Staphylococcus aureus* (MRSA), glycopeptide-resistant enterococci (GRE), *Clostridium difficile***	Make an accurate risk assessment. Demonstrate when urgent action is required based on epidemiology.	Multi-disciplinary team working	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Prevention of HAIs by sterilisation and disinfection	Describe the processes for disinfection and sterilisation in the hospital and primary care settings including **their indications advantages and limitations.**	Make an accurate risk assessment. **Demonstrate when urgent action is required if disinfection or sterilisation fails.**	Enthusiastic approach to learning	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Definition and prevention of speciality-associated HAIs	Describe the definitions of speciality-based HAIs. Describe the evidence for	Make an accurate risk assessment. Use antimicrobials appropriately to treat of prevent HAIs.	Consistency in approach to problems Risk-based approach	ABCDEFGHIKNP	DOPS MSF

	current recommendations on management in specific clinical situations, eg, particular surgical procedures, device-associated infections, adult and neonatal intensive care units, burns units, oncology and transplant units, cystic fibrosis units. Describe the context of in which HAIs occur due to resistant organisms, eg, MRSA, vancomycin-resistant enterococcus (VRE), ESBL producers. Describe antimicrobial treatment or prophylaxis appropriate above contexts. **Describe the use of methods of isolation/cohorting to control specific HAIs or resistant organisms in specialities.**	Use isolation/cohorting of patients to prevent HAI spread, including the pragmatic use of bed management.			CbD FRCPath exams
Physical layout of ward, departments and operating theatres	Describe ward, departmental and operating theatre design & layout relevant to infection prevention and control Demonstrate interpretation of regulations relating to hospital design and function.		Multidisciplinary team working.	**ABCDEFGHIKNP**	DOPS MSF CbD **FRCPath exams**
Ventilation	Describe the role of ventilation in operating theatres and suites, isolation rooms and other areas, e.g.	Make an accurate risk assessment. Demonstrate when urgent action is required	**Ventilation**	**ABCDEFGHIKNP**	DOPS MSF CbD

	pharmacy and laboratory. Describe the principles and importance, e.g. in surgical site infection, prevention of spread of TB. Describe the principles of operating theatre air sampling, validation of theatre ventilation commissioning tests and the regulations governing theatre ventilation. Describe the actions and solutions that may be necessary when ventilation systems do not meet current requirements.				**FRCPath exams**
Patient isolation	Describe when patient isolation or cohorting or ward closure, is used to control or prevent the spread of micro-organisms or infections. Describe the types of patient isolation, the specific precautions they use and in what circumstance they are used.	Make an accurate risk assessment. Demonstrate when urgent action is required Pragmatic use of bed occupancy	**Patient isolation**	**ABCDEFGHIKNP**	DOPS MSF CbD **FRCPath exams**
Reporting HAI's	Describe the requirements and mechanisms for reporting of HAIs within healthcare organisations (eg, route cause analysis), locally and nationally, including manadatory surveillance and 'serious untoward incidents' of infection.	Demonstrate when action is required Report clearly and accurately	**Reporting HAI's**	**ABCDEFGHIKNP**	DOPS MSF CbD **FRCPath exams**

	Describe the role of HAI reporting in total quality management, controls assurance, review body inspections, e.g. CQC				

3.3 Clinical microbiology – immunocompromised patients including HIV, transplantation and neutropenia

Objective: Describe specific problems related to opportunist infection including preventative diagnostic and therapeutic strategies

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Pathophysiology and clinical signs and symptoms of infection in compromised hosts **Biological and iatrogenic causes of immunodeficiency**	Describe the causes and risk factors of immunocompromise. Describe clinical and laboratory manifestations of immunocompromise.	Perform assessments of patients' risk of immunocompromise. **Integrate clinical and laboratory data to define immunocompromise in patients.**	Establish close rapport with clinical and laboratory staff.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Diagnosis, therapy and prevention of infection in immunocompromised host	Explain available diagnostic techniques and their limitations **Explain available therapeutic options and preventative measures**	Perform and interpret investigations relevant to the patient and achieve specific or differential diagnosis and initiate appropriate treatment. Perform risk-benefit analyses.	Non-judgmental, multidisciplinary team working.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

3.4 Clinical microbiology – Infection in critical care and sepsis

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Sepsis syndrome	Describe the pathophysiology of sepsis syndrome **Describe the rationale for interventions in sepsis syndrome**	**Recognition of the consequences of severe infection including disseminated intravascular coagulation (DIC) and sepsis syndrome.**	**Sepsis syndrome**	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Clinical management of patients	Explain the diagnosis and management of common infection problems in the ICU setting, e.g. ventilator-associate pneumonia, line-infections, septicaemia Describe outcomes of infection Outline evidence-base for diagnosis and management	Recognition and management of specific infection problems in the critically ill. Justify a course of action to clinical teams **Communication skills.**	**Clinical management of patients**	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

3.5 Clinical microbiology – outbreaks of infection in hospital and the community

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
General principles of outbreak investigation and prevention and control	Describe the use of surveillance to identify incidents/outbreaks. Ability to initiate investigation and control measures. Describe of the role of others in outbreak management, e.g. CCDC/CHP, RE, Centre for Infections (CfI) reference laboratories.	Dealing with the unexpected. Initiation of investigation and control measures. Recognition of abnormal patterns of infection. **Communication (both in writing and verbally) with colleagues, the media and the public.**	Working with colleagues and interacting as part of a team.	ABCDEFGHIJKLNP	DOPS MSF CbD FRCPath exams
Local procedures for the prevention and control of infectious diseases	**Describe the local 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.**	Know limits of knowledge.	ABCDEFGHIJKLNP	DOPS MSF CbD FRCPath exams
Specialist expertise	Describe the availability of expertise, including reference centres. **Outline modelling methods and their limitations.**	Ability to contact other sources of information and support when appropriate.	Appreciation of the role of other team workers.	ABCDEFGHIJKLNP	DOPS MSF CbD FRCPath exams

3.6 Clinical microbiology – infection in the returning traveller

Objective: to describe 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.

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Common causes of infection in returning travellers	**Describe the common causes of infection in returning travellers**	**Performing clinical/epidemiological assessment to investigate and manage patients with specific presentations, e.g. diarrhoea, fever, lymphadenopathy, soft tissue involvement.**	Enthusiasm and desire to diagnose and treat travellers' infections. Enthusiastic approach to learning and keeping up to date Willingness to seek expert advice Willingness to seek expert advice.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Common measures for preventin g infection in travellers	**Describe common measures for preventing infection in travellers, eg, travel vaccination, malaria prophylaxis, mosquito bite prevention, food and water precautions.**		Enthusiasm and desire to diagnose and treat travellers' infections.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Malaria	**Describe epidemiology, diagnosis, prevention and treatment.**	Using clinical and epidemiological assessment to select laboratory investigation and initial management. Risk assessing need for urgent action, eg, malaria, yellow fever, enteric fever. Statutory notification as appropriate Acquiring up-to-date information.	The ability to seek expert advice when necessary	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

Viral haemorrhagic fever	**Describe epidemiology, diagnosis, prevention and treatment.**	Clinical and epidemiological assessment and initial management	The ability to seek expert advice when necessary	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Emerging travellers or imported infections	**Outline diagnosis, prevention and treatment.of emerging travellers or imported infections, e.g. West Nile virus, other arboviruses**	Clinical and epidemiological assessment and initial management	The ability to seek expert advice when necessary	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Common tropical infections	**Describe epidemiology and distribution of common tropical infections, e.g. schistosomiasis, onchocerciasis, filariasis, trypanosomiasis, gastro-intestinal parasites, dengue, yellow fever, TB, HIV, enteric fever, cholera, dysentery**	Skills in the diagnosis of these infections	Enthusiastic approach to learning and keeping up to date Willingness to seek expert advice		

3.7 Clinical microbiology – food- and water-borne infection

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Food and water pathogens	**Describe the basic biology 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)**	Selection of the appropriate laboratory tests and their interpretation **Reporting to CCDC/CHP, health protection agencies and environmental health colleagues when appropriate.**	Establish good working relationships with CCDC/CHP, HPA and environmental health officers (EHOs).	ABCDEFGHI KNP	DOPS MSF CbD FRCPath exams
Food and water microbiology legislation	**Outline current legislation and guidelines on the microbiological testing of food and water. (Food includes milk and dairy products; water includes potable and bathing waters)**	Ability to select the appropriate tests and interpret their results. Describe the role of the CCDC/CHP, Health Protection Agency (HPA) and environmental health colleagues.	Establish good working relationships with CCDC/CHP, HPA and environmental health officers (EHOs).	ABCDEFGHI KNP	DOPS MSF CbD FRCPath exams
Endoscope water-disinfector microbiology	Describe the requirements for testing endoscopy rinse water and renal unit water, and the results that should be achieved	**Ability to interpret the results and take appropriate action.**	Establish good working relationships with the infection prevention and control team, clinicians and the Estates department.	ABCDEFGHI KNP	DOPS MSF CbD FRCPath exams

3.8 Clinical microbiology – sexually transmitted diseases

Objective: Description of STIs, including diagnostic, therapeutic and preventative strategies.

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Aetiology, pathogenesis and presentation of STIs	Describe the aetiology, pathophysiology and clinical presentation of STIs Describe the changing epidemiology of STIs	Analyse clinical, laboratory and epidemiological information and to use this to differentiate between the different STIs. Achieve a specific or differential diagnosis.	Enthusiastic approach to learning.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Diagnosis of STIs	Describe the available diagnostic tests for STIs and their limitations, including culture, serology, antigen detection and nucleic acid detection. Compare and contrast the advantages and disadvantages of different diagnostic methods	Select, perform and interpret appropriate tests. **Rational use of resources.**	Establish close rapport and understanding with laboratory staff.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Congenital infections	Describe the infections that can be transmitted from mother to baby during the antenatal, perinatal and postnatal period. **Explain the role of risk avoidance, therapeutic interventions, immunisation and**	**Interpret and explain simply and effectively results to clinicians**	Establish rapport with clinical and primary care staff.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

	Caesarian section in the prevention of congenital infections				
Management of STIs	Describe therapeutic options and preventative measures. Explain the importance of health education, contact tracing and partner notification in reducing the incidence of STIs.	Select the appropriate antimicrobial in the clinical setting. Liaise between clinicians, laboratory and genito-urinary medicine (GUM) staff including health advisors. Coordinate laboratory testing within screening programmes if indicated.	Work collaboratively within a multidisciplinary team. Recognise the need for confidentiality.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

3.9 Clinical microbiology – occupationally acquired disease

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Occupationally-acquired infection	Outline the zoonotic infections that may be occupationally acquired Discusss the implications of blood-borne viruses (BBVs) for HCWs. Describe the management of 'inoculation incident' and follow-up for healthcare workers (HCWs), including screening and counselling Describe local, national and international guidelines and standards in relation to occupational exposure to infection	Management of 'inoculation incident'. Organise the laboratory testing associated with 'inoculation incident' and liaise with Occupational Health.	Recognise the need for confidentiality at all times. Empathy towards co-workers. Recognise limits of knowledge and need to seek specialist advice.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

3.10 Clinical microbiology – paediatric infection

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Paediatric infection	Describe the 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. Describe relevant diagnostic techniques. Outline the pharmacokinetics of prescribing for children. Describe the antimicrobials best avoided in children	Consider different diagnostic possibilities and treatments in children compared to adults.	Empathy with parents and children. Cooperative working within a multidisciplinary team	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

3.11 Clinical microbiology – Infection in pregnancy

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Pregnancy and the immune system	Describe the effects of pregnancy on the immune system	Recognise clinical manifestations of physiological immunodeficiency associated with pregnancy.	Empathy with patient and family. Cooperative working within a multidisciplinary team.	ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Pregnancy-specific infections	Describe the aetiology, risk factors, clinical presentation and diagnosis of infections specific to pregnancy, e.g. septic abortion, chorioamnionitis and endometritis	Take relevant clinical history, select, interpret and perform relevant laboratory tests.		ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Infections important in pregnancy	Describe the aetiology, risk factors, clinical presentation and diagnosis of infections considered important in pregnancy, including urinary tract infections, sexually transmitted infections, fungal infection including candidosis, parasitic diseases, e.g. toxoplasmosis and malaria in pregnancy			ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams
Treatment of infections in pregnant women	Describe the use of antimicrobials in treating infections in pregnancy Describe potential teratogenicity when prescribing in pregnancy and the need to avoid certain antimicrobials	Consider different therapeutic strategies in pregnant women compared to other patients.		ABCDEFGHIKNP	DOPS MSF CbD FRCPath exams

4 SPECIALIST AREAS OF MICROBIOLOGY

Objectives: the trainees will acquire a working knowledge of:
4.1 Virology.
4.2 Health protection and epidemiology.
4.3 Mycology.
4.4 Parasitology.
4.5 Oral microbiology

4.1 Virology

(Microbiology trainees should normally undertake 6–12 months training in virology, at least one month of which should take place before the FRCPath Part 1 examination. The delivery of the virology training is a local matter.)

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessmen
Pregnancy and viral infection	Describe the investigation, intervention and advice for women with, or in contact with, rash/illness in pregnancy. Describe the natural history of cytomegalovirus rubella, parvovirus B19, measles, enterovirus, hepatitis B, HIV, hepatitis C in relation to pregnancy. Describe rates of abnormality and fetal loss in cases complicated by, in comparison to those not complicated by, viral infection. Describe risk, and absence of evident risk, of viral immunisations.	Select, interpret and perform (kit-based) relevant virological tests. Use past results and archived serology samples to achieve diagnosis.	Empathic with women concerned regarding rash illness or exposure thereto in pregnancy. Empathic with hospital and community midwives in managing reported exposure or illness. Able to maintain productive relationship with reference laboratory staff and consultants.	ABCDEF GHIKNOP QR	DOPS MSF CbD FRCPath exams

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Blood-borne virus infected healthcare worker	Describe the investigation, intervention and advice following ascertainment of a healthcare worker with a blood-borne viral infection. Describe the reporting mechanisms of such incidents. Explain the relevance of past employment. Describe role and use of prophylactic measures. Outline the role of public notification exercises, helplines and lookback investigation testing.	Recognise potential situations requiring intervention, whether as a result of an enquiry or upon reviewing results, and constructively support the infection prevention and control doctor/Director of Infection Prevention Control/CCDC 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. Select, perform and interpret relevant virological tests. Able to act as resource for protocol drafting for helpline staff. Capable of managing time in fluid situations.	Empathic with concerns of public, healthcare workers, managers and laboratory staff. Able to maintain productive relationship with all involved in such episodes. Practised in media interview behaviour.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Eye infections	Describe the aetiology, risk factors, and clinical presentation of eye infections with adenovirus, herpes simplex virus, chlamydia	Competent to select, perform and interpret relevant virological tests.	Empathic with patients, clinical, laboratory and ancillary staff. Able to create and maintain productive relationships with all involved.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Pharyngitis	Describe the aetiology, risk factors, and clinical presentation of viral causes of pharyngitis and infectious mononucleosis	Competent to select, perform and interpret relevant virological tests.	Empathic with patients, clinical, laboratory and ancillary staff. Able to create and maintain productive relationships with all involved.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Viral hepatitis	Describe the epidemiology and risk	Select, perform and interpret relevant virological tests.	Empathic with patients, clinical, laboratory and	ABCDEFGHIKNOPQR	DOPS

	factors. Describe the management of acute cases, including appropriate information for the management of contacts, ascertainment of risk factors and notification. Describe the investigation of individual cases, methods for and significance of virus quantitation.	Perform statutory notification	ancillary staff. Able to create and maintain productive relationships with all involved.		MSF CbD FRCPath
Rotavirus **Norovirus**	Describe the epidemiology and risk factors of infections. Describe the management of acute cases, including infection prevention and control.	Select, perform and interpret relevant virological tests. Working with infection prevention and control team in management of outbreak of infection with suspected norovirus.	Assertiveness. Recognition of skills and priorities of other specialties.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath
Respiratory infections with RSV and influenza	Describe the epidemiology and risk factors in hospitals and the community of RSV and influenza. Describe the use of antivirals in prophylaxis and treatment of risk groups. Describe the use of immunisation in prevention. Describe infection prevention and control precautions to prevent	Select, perform and interpret relevant virological tests. Use antivirals to treat and prevent infection.	Cooperative working within a multidisciplinary team. Prompt and relevant decision-making with clear communication	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath

	spread				

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching & learning methods**	**Assessment**
Smallpox	Describe the identification and investigation of suspected cases. Describe the need for liaison reference facilities and public health teams (notification) and infection prevention and control team in investigation and management.		Recognise limits of knowledge and need to seek specialist advice.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Rabies	Describe the investigation and management of potential contact in returned travellers, of bat associated bites and of suspected clinical cases			ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Viral haemorrhagic fevers and dengue	Describe the epidemiology and risk factors Describe the identification, including differential diagnosis, and investigation of suspected cases. Describe the need for liaison reference facilities and infection prevention and control team in investigation and management.	Select appropriate tests and to interact with reference laboratories in arranging specimen transport and testing; interpret relevant virological tests. Advise infection prevention and control team where appropriate	Recognise limits of knowledge and need to seek specialist advice. Cooperative working within a multidisciplinary team. Prompt and relevant decision-making with clear communication	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Rickettsial diseases	Describe the epidemiology and risk factors Describe the identification, including differential diagnosis, and investigation of suspected cases. Describe the need for liaison	Select appropriate tests and to interact with reference laboratories in arranging specimen transport and testing; interpret relevant virological tests.	Recognise limits of knowledge and need to seek specialist advice.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams

	reference facilities				

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Encephalitis and meningitis	Describe the clinical presentation, management and investigation of CNS infections due to Herpes simplex virus (including recurrent infection) and enteroviruses	Select appropriate tests and to interact with reference laboratories in arranging specimen transport and testing when needed; interpret relevant virological tests. Advise clinical teams on treatment. Advise infection prevention and control team where appropriate	Recognise limits of knowledge and need to seek specialist advice. Prompt and relevant decision-making with clear communication	**ABCDEFGHIKNOPQR**	DOPS MSF CbD FRCPath exams
Psittacosis and *Chlamydia pneumoniae* **Q fever**	Describe the clinical presentation, management, investigation and notification			**ABCDEFGHIKNOPQR**	DOPS MSF CbD FRCPath exams
Varicella-zoster	Chickenpox; describe the 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 prevention and control in relation to the immunosuppressed, and neonates and the pregnant Zoster: describe risk factors and the management of infection in 'normal' people, pregnancy and the immunocompromised				

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Creutzfeldt-Jakob disease (CJD) **Variant CJD**	Describe the clinical presentation, management, investigation and reporting.	Competent to liaise with reference facilities in investigation, and to advise infection prevention and control teams.		ABCDEFGHIKNOP QR	DOPS MSF CbD FRCPath exams
Viral infection of immunocompromised patients	Describe the risk factors for, clinical presentation, management and investigation of infection due to: BK, CMV, EBV, HHV-6, adenovirus Outline the treatment of infections. Outline the infection prevention and control precautions for these infections	Competent to select, perform and interpret relevant virological tests.	Recognise limits of knowledge and need to seek specialist advice. Cooperative working within a multidisciplinary team. Prompt and relevant decision-making with clear communication	ABCDEFGHIKNOP QR	DOPS MSF CbD FRCPath exams
Occupational health and viruses	Describe the risk factors for, clinical presentation, management and investigation of infection from: Hepatitis B virus, Hepatitis C virus, HIV, Influenza virus, Varicella-Zoster virus, and Herpes simplex virus. Describe precautions required by healthcare workers if infected with these viruses.	Competent to select, perform and interpret relevant virological tests. Liaise with Occupational Health	Recognise limits of knowledge and need to seek specialist advice. Cooperative working within a multidisciplinary team. Prompt and relevant decision-making with clear communication	ABCDEFGHIKNOP QR	DOPS MSF CbD FRCPath exams

4.2 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.

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Surveillance	Demonstrates the principles and practices of surveillance of infectious disease, including the use of routine and enhanced surveillance systems	Correctly utilise laboratory reporting and monitoring trends (e.g. in antimicrobial resistance). Demonstrate competence in data handling and interpretation. Recognition of value and limitations of surveillance systems (e.g. for surgical site infection, other HAI, Legionnaires' disease, meningococcal disease, TB).	Adopt an enthusiastic approach Methodical but intuitive.	ABCDEFGHI KNOPQR	DOPS MSF CbD FRCPath exams
Individuals responsible for Health Protection	Describe the role of others in the prevention and control of infection	Liaise and communicate with CCDCs, Consultants in Health Protection, EHOs, REs, etc.	Collaborative, establishes rapport and understanding with colleagues.	ABCDEFGHI KNOPQR	DOPS MSF CbD FRCPath exams
Immunisation	Describe the general principles involved in immunisation programmes Describe methods of vaccine delivery, surveillance of immunisation programmes and evaluation of vaccine efficacy.		Risk-based approach.	ABCDEFGHI KNOPQR	DOPS MSF CbD FRCPath exams
Occupational health and travel health procedures		Able to give basic health and travel advice and refer to other sources of information and support.	Know limits of knowledge.	ABCDEFGHI KNOPQR	DOPS MSF CbD FRCPath exams

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Agents of bio-terrorism	Describe the epidemiology, risk factors, clinical presentation of current perceived potential microbiological agents for bio-terrorism. Outline the potential for abuse of laboratory organisms for bioterrorism and the current relevant legislative framework, including the Prevention of Terrorism Act 2004.	Recognise abnormal patterns of infection. Deal with the unexpected. 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.	Multidisciplinary team working. Recognition of skills and priorities of other. Willingness to seek advise and help. Seek expert help when necessary. Attitudes towards laboratory security should be in accord with the principles of Good Medical Practice.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Reference Laboratories	**Describe the role and function of reference laboratories**	Awareness of the need for timely referral of material to reference laboratories. Use the expertise of reference laboratories to inform local practice.	Know how to obtain expert advice and support.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams

4.3 Mycology

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

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Superficial fungal infection	Describe the aetiology, risk factors and clinical presentation and treatment of fungal infections of skin, hair, nails and mucous membranes.	Recognise clinical features of superficial infection caused by dermatophytes and yeasts. Examine skin, hair, nails etc for presence of fungal elements. Identify yeast, dermatophyte fungi and other common moulds from clinical material. Recommend appropriate treatment.	Establishes close rapport and understanding with laboratory staff.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Systemic fungal infection and endemic fungal infection	Describe the aetiology, risk factors and clinical presentation systemic and endemic mycoses including candidosis, aspergillosis, cryptococcosis, histoplasmosis. coccidioidomycosis, and blastomycosis. Describe use of appropriate antifugal agents. Describe methods available for susceptibility testing and their limitations. Describe the use of chemoprophylaxis and environmental measure to prevent infection in the immunocompromised.	Patient risk assessment for systemic infection or infection acquired from endemic area. Request appropriate specimens for diagnosis reference laboratory tests including appropriate serological and molecular test as available. Identify yeasts and filamentous fungi commonly encountered. Ability to recognise when susceptibility testing is required for an individual patient.	Prompt and relevant decision making with clear communication. Multidisciplinary team working. Risk-based approach.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams

4.4 Parasitology

Subject	Knowledge	Skills and knowledge application	Behaviours	Teaching & learning methods	Assessment
Epidemiology of parasitic disease	Describe the epidemiology of: • Imported parasitic infections with an emphasis on the infections common in European practice: e.g. malaria, intestinal protozoa, intestinal helminths, leishmaniasis, trypanosomiasis, filariasis and schistosomiasis • Endemic parasitic infections including for example toxoplasmosis, toxocariasis, giardiasis, hydatid disease • Parasitic infections associated with severely immunocompromised patients, e.g. microsporidiosis, cryptosporidiosis Describe the conditions under which infections are acquired so that the risk of infection to patients can be assessed	Plan an appropriate investigation scheme for individuals at risk of tropical infection.	Prompt and relevant decision making with clear communication. Multidisciplinary-team working. Risk-based approach	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Clinical features and laboratory diagnosis of parasitic	Describe the clinical features and laboratory diagnosis of: • Imported parasitic infections (above)	Examine blood, stool, and other tissues for the presence of protozoa and helminths. Identify major parasitic species. Measure parasite size under the	Establishes close rapport and understanding with laboratory staff.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams

disease	• Endemic parasitic (above) Parasitic infections associated with severe immunocompromise (above)	microscope. Estimate malaria parasite numbers. Select appropriate serological and molecular diagnostics for parasitic infections. Use reference facilities appropriately. Recommend appropriate treatment.	Willingness to use reference services appropriately.		
Treatment of parasitic disease	Describe the use antiparasitic drugs including antimalarial agents, imidazoles, ivermectin, praziquantel Describe in detail the diagnosis and management of toxoplasmosis in the context of pregnancy.		Prompt and relevant decision making with clear communication. Multidisciplinary-team working. Risk-based approach Willingness to use reference services appropriately.	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams

4.5 Oral Microbiology

Background: The period of training in oral microbiology will consist of consolidation of clinical and laboratory work started in Stage A up to consultant level. The trainee will have a sound theoretical and practical knowledge of clinical microbiology practice but will not have had a great deal of unsupervised experience in applying that knowledge. The time spent in clinical oral microbiology will be dependent on individual trainee background and local circumstances. The training may take the form of blocks on secondment or on a sessional basis in a laboratory processing diagnostic oral microbiology specimens. It is recommended that trainees continue their training in medical microbiology in Stages B, C and D which may include exposure to on-call microbiology experience (see section 6) whilst undertaking oral microbiology training.The stage of oral microbiology training is thus devoted to acquiring self-sufficiency in the specialty. It is meant to be a guide for both the educational supervisor and trainee on the learning topics and themes that should be covered during these stages of training. It is recommended that the educational supervisor and the trainee plan this training at the beginning of Stage B and plan the training as much as possible.
Use should be made of the College's LEPT system to record progress in training. In order to facilitate training in oral microbiology a number of additional in-course assessments are provided which should be submitted in the trainees training portfolio.
Objectives: Description of infectious diseases of the oral cavity and head and neck region, including diagnostic, therapeutic and preventative strategies. Description of infection control procedures relevant to all branches of dental and oral surgery.

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Dental caries	Describe the normal flora of the oral cavity. Explain the pathophysiology of, and risk factors for the development of, dental caries. Describe the therapy and prevention of dental caries.	Select appropriate tests for diagnosis and interpret their results in relation to treatment and prevention. Liaise between clinicians and laboratory. Recommend appropriate treatment and preventative measures.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIK NOPQR	DOPS MSF CbD FRCPath exams
Peridontal diseases	Describe the normal flora of the oral cavity. Explain the pathophysiology pathophysiology of, and risk factors for the development of, periodontal diseases. Describe the therapy and prevention of periodontal diseases.	Select appropriate tests for diagnosis and interpret their results in relation to treatment and prevention. Liaise between clinicians and laboratory.. Recommend appropriate treatment and preventative measures.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIK NOPQR	DOPS MSF CbD FRCPath exams

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessmen
Purulent infections of the head and neck region, including dentoalveolar infections, osteomyelitis of the jaws and salivary gland infections	Describe the normal flora of the oro-pharynx. Explain the pathophysiology of,, and risk factors for the development of, purulent infections of the head and neck region, including dentoalveolar infections, osteomyelitis of the jaws and salivary gland infections.	Select appropriate tests for diagnosis and interpret their results in relation to treatment and prevention. Liaise between clinicians and laboratory.. Recommend appropriate treatment and preventative measures.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Fungal infections of the oral cavity	Describe the normal fungal flora of the oral cavity. Explain the pathophysiology of,, and risk factors for the development of, fungal infection of the oral cavity Describe methods available for antifungal drug susceptibility testing	Select appropriate tests for diagnosis and interpret their results in relation to treatment and prevention. Liaise between clinicians and laboratory.. Recommend appropriate treatment and preventative measures.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Viral infections of the head and nectk	Explain the pathophysiology of,, and risk factors for the development of, viral infections of the head and neck region caused by: herpes simplex, herpes zoster, Epstein Barr virus	Select appropriate tests for diagnosis and interpret their results in relation to treatment and prevention. Liaise between clinicians and laboratory.. Recommend appropriate treatment and preventative measures.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Oral infection in the compromised host including oral	Describe the role of immunocompromise in the pathophysiology of oral infection. Describe the clinical	Recognise clinical and laboratory manifestations of immunodeficiency. Select appropriate tests for diagnosis of oral infection and interpret their results in relation to treatment and prevention.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath

manifestations of HIV infection	manifestations of oral infection in the immunocompromised host. Describe the manifestations of oral disease in patients with HIV infection	Liaise between clinicians and laboratory.. Recommend appropriate treatment and preventative measures for oral infection.			exams
Systemic infection caused by oral flora	Describe the role of the oral flora in systemic infection, eg, endocarditis, neutropenic sepsis and ventilator associated pneumonia	Select appropriate tests for diagnosis and interpret their results in relation to treatment and prevention. Liaise between clinicians and laboratory.. Recommend appropriate treatment and preventative measures related to the oral source of infection.	Establishes close rapport and understanding with clinical and laboratory staff	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Antibiotic prophylaxis	Describe the use of prophylactic use of antimicrobial drugs in dental and oral surgery. Describe the national guidelines currently applicable. Explain the risks and benefits of this prophylaxis.	Recommend appropriate antimicrobial prophylaxis for patients undergoing dental proceduces.	Establishes close rapport and understanding with clinical staff	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams
Infection Control relevant to dental surgery	Describe current procedures and legislation relevant to infection control in dental surgery. Explain recommended procedures involved in instrument decontamination in dentistry Discuss the risks of transmission of microorganisms from infected dental health care workers to patients	Advise clinical staff on practical issues related to infection prevention and control in dentistry.	Establishes close rapport with clinical staff and infection prevention and control practitioners	ABCDEFGHIKNOPQR	DOPS MSF CbD FRCPath exams

	Describe the national guidelines on restrictions of working practices of such staff.				

5 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.

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Laboratory management and practice	**Define good laboratory management** **Explain the concepts of good laboratory practice** **Summarise the process of management and being managed**	Demonstrate awareness of organisation and structure of a microbiology/virology laboratory including: • staffing and financial issues • planning • implementation of policies and rotas.	Establish a close rapport and understanding with laboratory staff. Respond constructively to change. Demonstrate appropriate behaviours in multidisciplinary team working. Display leadership		
Laboratory accreditation	**Describe the criteria for laboratory accreditation**	Implement these criteria.			
Appraisal	**Describe how the appraisal process works**	Use constructive listening, mentoring, and appraisal skills. Use personal appraisal constructively			

Clinical audit	Describe the process of clinical audit	Audit and evaluate: • personal and departmental activities • existing and new tests, techniques or clinical services.	qualities. Show prompt and relevant decision making with clear communication. Recognise need for change, and principles involved. Be open minded		

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching & learning methods**	**Assessment**
Standards of professional practice and clinical governance	Describe the importance of clinical governance and delivery of high-quality standards in microbiology and virology. Describe the concept of clinical risk management and procedures designed to minimise risks. Outline the importance of patient consent to use data or specimens for ethically approved research or teaching.				
External organisations	Maintain an up to date knowledge of the organisation of NHS and allied organisations Outline the role of HPA, Food Standards Agency (FSA), CQC and NICE Outline the healthcare structures (including primary care teams).		Demonstrate appropriate behaviours in multidisciplinary team working. Network appropriately		

Teaching	Explain how to utilise the teaching methods, assistance and resources available	Demonstrate good presentation skills, good public speaking and organisation of teaching.	Teach and communicate competently. Describe the methods available for susceptibility testing and outline their limitations.		

Subject	**Knowledge**	**Skills**	**Behaviours**	**Teaching & learning methods**	**Assessment**
Information technology	Information technology: Demonstrate: • a working knowledge of laboratory data entry and retrieval and surveillance systems. • knowledge of the Data Protection Act	Search electronic databases and use the Internet as a learning and communication resource. Demonstrate competent use of database, word processing and statistics programmes. Define how to undertake searches. Apply the principles of confidentiality and their implementation in terms of clinical practice.	Adopt proactive and enquiring attitude to new technology.		

6. Developing independent practice

Objective: Throughout their training, trainees are given increasing responsibility and independence appropriate for their demonstrated level of competence and professional development, as judged by their clinical and educational supervisors. The purpose of this component of training is to take such graded responsibility further, to enable the transition to the independent practice required of a CCST holder.

Demonstration of the skills required for independent practice is a requirement of the curriculum, and the relevant competencies must be assessed and achieved prior to completion of the training programme.

Currently, the most appropriate context in which to train for and achieve the competencies for independent practice is out of hours working, in an "on-call" setting. However, there may be practical alternatives to this training context. If a training programme does not offer the opportunity to develop and demonstrate these skills through out of hours working, there must be alternative arrangements agreed by the Training Programme Director in consultation with the local Deanery Specialty Training Committee or Postgraduate School of Pathology Board

Since the trainee will have reduced supervision during this form of training, to ensure patient safety and to optimise the benefits of this training, the following criteria must be met before it starts:

- The trainee must have been assessed by clinical and educational supervisors to be capable of safe practice with reduced supervision in the areas of clinical, laboratory, infection prevention & control and public health work. He/she must therefore be in full compliance with the educational processes of RITA i.e., ready to start more independent practice.
- Before starting this training, the trainee must have a formal induction to ensure that he/she is familiar with the clinical, laboratory, infection prevention & control, public health, occupational health and administrative/management aspects of the work to be performed. This induction must be relevant to the time at which the work is to be performed, and for the organisations for which it is to be performed. It will include relevant local policies.
- The supervisor must ensure that the trainee can describe the professional obligations of this form of practice, including availability and confidentiality.
- The trainee must have demonstrated to clinical and educational supervisors through previous directly supervised practice, competence in managing common clinical, laboratory, infection prevention & control, public health, occupational health problems of the kind likely to be encountered in the microbiology service, relevant to the setting in which the trainee will undertake this form of practice. Such competence will include the investigation and management of serious sepsis acquired in healthcare institutions and the community; the investigation and management of outbreaks of infection in healthcare institutions; statutory and ‘good practice’ notification of infectious disease; and the management of inoculation incidents acquired in healthcare institutions and the community.
- Arrangements for ‘handover’ of clinical responsibility during this form of practice must be explicit.

Arrangements for cover by clinical supervisor

The ultimate responsibility for the quality of patient care and the quality of training lies with the supervisor. However, the trainee will be expected to exercise professional judgement in recognising the limits of his/her capabilities and in involving senior colleagues in complex or challenging issues/decisions. The arrangements for obtaining such help and advice, at any time during this training period, must be formal and explicit. Whilst the purpose of this training is enable independent working, the trainee must not be discouraged from asking for help from a clinical supervisor during this period at any time.

After a period of independent practice, the trainee must be debriefed by the clinical supervisor. The purpose of this debrief is to ensure that patients are being managed safely, and that prompt feedback is provided on the trainee's performance against the relevance competencies for this form of training (see below) and other competencies in the curriculum. The debriefing session may take the form of 'handover' to colleagues.

This training is evaluated using Case-based Discussion (CbDs) and/or Evaluation of Clinical/Management Events (ECEs).

Competencies to be demonstrated

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Independent practice	Demonstrate: Increasing familiarity with laboratory and clinical aspects (including infection prevention and control, public and occupational health) aspects of bacterial, viral and related infections Knowledge of what must be dealt with urgently and what may be dealt with in a longer time period	Recognising one's own limitations in knowledge. Liaising and communicating with a wide range of healthcare workers involved the diagnosis, management, prevention and control of infection. Communicating effectively in person or by phone. Referring to more experienced colleagues as appropriate. Providing continuity of care Prioritising work in relation to clinical urgency. Dealing with difficult situations independently. Recognising competing pressures on healthcare resources, eg, availability of laboratory tests, availability of beds. Collecting, analysing and interpreting information from a variety of sources. Making safe decisions when clinical, laboratory or epidemiological information is incomplete or evolving. Working with clinical and laboratory colleagues under pressure.	Flexibility to respond to change depending on the clinical situation. Confidence to work progressively independently. Willingness to seek appropriate senior advice. Willingness to take responsibility for being available and for decision making. Willingness to communicate effectively with other healthcare workers. Collaborating with other healthcare workers over use of resources.		

6. Research And Development In Oral Microbiology

Trainees should undertake a short research project relevant to the field of oral microbiology. The objective of the project is to equip the trainee with the basic skills necessary to undertake a laboratory-based research project and to understand other people's research output.
Duration: an indicative period of a minimum of three months that would normally be expected to result in a dissertation being produced to the standard of that expected for a Masters degree.
Special requirements: those trainees who wish to obtain an MD/PhD should make every effort to obtain a clinical fellowship. These are awarded by research councils and charities (information available from the academic supervisor). One year of a three-year postgraduate programme will count towards training, and these trainees will be required to complete an OOPE form. Further advice can be sought from the academic representative on the Microbiology CATT if required.

Subject	Knowledge	Skills	Behaviours	Teaching and learning methods	Assessment
Research and development	Demonstrate familiarity with skills required for planning, undertaking and reviewing research projects.	• Undertake a preliminary literature review around the project, a summary of this literature should be retained in the portfolio. • Write a one-page proposal outlining the study. Apply for funding if required. Apply for Ethics approval, if required. • If required perform bench work skills associated with the project. • If required undertake work to support project such as, epidemiology/surveillance/informatics associated with the project. • Keep clear concise records of results. • Analyse project results.	Enthusiastic approach to research. Observe safe working laboratory practice. Establish a rapport with other scientific staff.	AFGHQR	This can be **either**: a) paper accepted for publication **or** b) project report (equivalent in standard to Master degree project) **or** c) MD/PhD thesis.

		• Write up project in the form of a dissertation (max 6000 words), formal publication or thesis (MD/PhD only). • Present project to collegues in oral (?+other) form.			

7. 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.

Subject	Knowledge	Skills	Behaviours	Teaching & learning methods	Assessment
Laboratory management and practice	Laboratory management Concepts of good laboratory practice Describe the process of management and being managed	Awareness of organisation and structure of a microbiology /virology laboratory including: • staffing and financial issues • planning • implementation of policies and rotas.	Establishes close rapport and understanding with laboratory staff.	ABCDEFGHIJKL NOPQR	DOPS MSF CbD FRCPath exams
Laboratory accreditation	Laboratory accreditation Describe the criteria for accreditation	Able to implement these criteria.	Responds constructively to change.	ACEHJL	MSF

Appraisal	Appraisal	Constructive listening, mentoring, appraisal skills.	Multidisciplinary team working.	ACEHJL	MSF
Clinical audit	**Define good laboratory management** **Explain the concepts of good laboratory practice** **Summarise the process of management and being managed**	Demonstrate awareness of organisation and structure of a microbiology/virology laboratory including: • staffing and financial issues • planning **implementation of policies and rotas.**	Establish a close rapport and understanding with laboratory staff. Respond constructively to change. Demonstrate appropriate behaviours in multidisciplinary team working. Display leadership qualities. Show prompt and relevant decision making with clear communication. Recognise need for change, and principles involved. Be open minded	ABCDEFGHIJKL NOPQR	DOPS MSF CbD
Standards of professional practice and clinical governance	**Describe the criteria for laboratory accreditation**	**Implement these criteria.**		ACEHJL	MSF
External organisations	**Describe how the appraisal process works**	Use constructive listening, mentoring, and appraisal skills. **Use personal appraisal constructively**		ACEHJL	MSF
Teaching	**Explain how to utilise the teaching methods, assistance and resources available**	Demonstrate good presentation skills, good public speaking and organisation of teaching.	Teach and communicate competently. Describe the methods available for susceptibility testing and outline their limitations.	HIOQ	MSF
Information Technology	Information technology: Demonstrate: a working knowledge of laboratory data entry and	Search electronic databases and use the Internet as a learning and communication resource. Demonstrate competent use of database,	Adopt proactive and enquiring attitude to new technology.	GHS	MSF

	retrieval and surveillance systems. **Knowledge of the Data Protection Act**	word processing and statistics programmes. Define how to undertake searches. Apply the principles of confidentiality and their implementation in terms of clinical practice.			

APPENDIX 1 ABBREVIATIONS

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

GRE Glycopeptide-resistant enterococci
GUM Genito-urinary medicine
HAI Hospital-acquired infection
HCC Healthcare Commission
HCW Healthcare worker
HEV Hepatitis E Virus
HIV Human immunodeficiency virus
HPA Health Protection Agency
ICC Infection Control Committee
ICD Infection control doctor
ICT Infection Control Team
ICU Intensive care unit
IF Immunofluorescence
IgG Immunoglobulin G
IgM Immunoglobulin M
IT Information technology
JCPT Joint Committee on Pathology Training
JRCPTB Joint Royal Colleges of Physicians Training Board
LAC Lay Advisory Committee
LCR Ligase chain reaction
Mini-CEX Mini-clinical evaluation exercise
MLA Medical laboratory assistant
MMC Modernising Medical Careers
MRCP Membership of The Royal College of Physicians
MRCP(I) Membership of The Royal College of Physicians, Ireland
MRSA Meticillin-resistant *Staphylococcus aureus*
MSF Multi-source feedback
NASBA Nucleic Acid Sequence Based Amplification
NEQAS National External Quality Assurance Service
NHS National Health Service
NICE National Institute for Health and Clinical Excellence
NICU Neonatal intensive care unit
NPSA National Patient Safety Agency
NTN National Training Number
NTN(A) National Training Number (Academic)

OOPE Out-of-programme experience
PCR Polymerase chain reaction
PMETB Postgraduate Medical Education and Training Board
RE Regional epidemiologist
RIDDOR Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
RITA Record of In-Training Assessment
RNA Ribonucleic acid
RSV Respiratory syncytial virus
RT-PCR Real time - polymerase chain reaction
SAC Specialist Advisory Committee
SCBU Special care baby unit
SDA Strand Displacement Assay
SGM Society for General Microbiology
SOP Standard operating procedures
ST Specialty training
STC Specialty Training Committee
STI sexually transmitted infection
TAC Trainees Advisory Committee
TB Tuberculosis
TSE Transmissible spongiform encephalopathy
vCJD Variant Creutzfeldt-Jakob disease
VHF Viral haemorraghic fever
VRE Vancomycin-resistant enterococcus