

TRAINEE HANDBOOK 2018



Microbiology

It is essential to read this Handbook in conjunction with the ***Trainee Handbook – Administrative Requirements*** which is relevant to all trainees. This has information about the College's structure and policies, together with details of requirements for registration, training and examination applications.

TABLE OF CONTENTS

Glossary	i
Section 1	1
Introduction	1
General aims of the training program	1
Training requirements	2
Supervision	3
Assessment	4
Learning resources	5
Section 2 Learning outcomes and recommended training activities	6
1 Discipline-specific functions as medical specialist in the laboratory.....	7
2 Functions of the pathologist as manager in the laboratory	15
3 Research and scholarship.....	19
4 Professional qualities	22
Section 3 Appendices	25
Appendix 1 Basic Pathological Sciences Examination	26
Appendix 2 Part I assessment.....	27
Appendix 3 Part II assessment.....	30
Appendix 4 Guidelines for completing the Supervisor Report Form	34
Appendix 5 Portfolio requirements	35
Appendix 6 Forms and logbook pages	37
Appendix 7 Major project proposal and project guidelines.....	51
Appendix 8 Minor project guidelines.....	55
Appendix 9 Assessment matrix.....	57

GLOSSARY

AGAR	Australian Group for Antimicrobial Resistance
AIDS	Acquired Immune Deficiency Syndrome
ASA	Australian Society for Antimicrobials
ASID	Australasian Society for Infectious Diseases
ASM	Australian (American) Society for Microbiology
BSAC	British Society for Antimicrobial Chemotherapy
CAP	College of American Pathologists
CbD	Case-based Discussion
CDC	Centers for Disease Control and Prevention (USA)
CDS	Calibrated Dichotomous Sensitivity (testing)
CJCT	Committee for Joint College Training
CLSI	Clinical and Laboratory Standards Institute
CPDP	RCPA Continuing Professional Development Program
CRBSI	Catheter related blood stream infection
CVL BSI	Central venous line blood stream associated infection
DFAT	Department of Foreign Affairs and Trade
DoHA	Department of Health and Ageing
DOPS	Directly Observed Practical Skills
EAGAR	Expert Advisory Group on Antimicrobial Resistance
EUCAST	European Committee on Antimicrobial Susceptibility Testing, a standing committee of ESCMID
ESCMID	ESCMID European Society of Clinical Microbiology and Infectious Diseases
FRACP	Fellow of the Royal Australasian College of Physicians
FRCPA	Fellow of the Royal College of Pathologists of Australasia
IANZ	International Accreditation New Zealand
ISID	International Society for Infectious Diseases
ISO	International Organization for Standardization
IT	Information Technology
LI(M)S	Laboratory information (management) system
M Epi	Master of Epidemiology
MB1(2)	RCPA Microbiology Part I (II) examination

MD	Doctor of Medicine
MMWR	Morbidity and Mortality Weekly Report
MPH	Master of Public Health
NAA	Nucleic acid amplification
NATA	National Association of Testing Authorities
NPAAC	National Pathology Accreditation Advisory Council
OHS	Occupational Health and Safety
PCR	Polymerase chain reaction
PhD	Doctor of Philosophy
PHLN	Public Health Laboratory Network (Australia)
POWI/SSI	Post-operative wound infection/surgical site infection
QA	Quality Assurance
QAP	RCPA Quality Assurance Programs Pty Ltd
QC	Quality control
QM	Quality management
RACP	Royal Australasian College of Physicians
RCPA	Royal College of Pathologists of Australasia
RNA	Ribonucleic Acid
SOP	Standard operating procedure
SSBA	Security sensitive biological agents
TB	Tuberculosis
WHO	World Health Organization
WHS	Workplace Health and Safety
WPBA	Workplace-based assessment

Section 1

INTRODUCTION

The discipline of Microbiology involves the use of laboratory techniques to diagnose infectious diseases, recommend antibiotic therapy and to advise, correlate, coordinate and educate clinicians regarding aspects of the pathogenesis, epidemiology, prevention and management of infection. Clinical microbiologists work in diagnostic medical/pathology laboratories. The work focuses on the collection, analysis, reporting and interpretation of results to aid in the diagnosis, treatment and surveillance of infectious diseases. Opportunities exist to conduct research in the subspecialties of bacteriology, virology, mycology, parasitology, serology or molecular microbiology.

PERSONAL CHARACTERISTICS NEEDED

The Clinical Microbiologist needs to have:

- the ability to make sound clinical judgments;
- good computing skills and organisational ability;
- the ability to lead, to work autonomously and to work well as part of a team of medical, nursing and laboratory staff as well as the wider discipline of Pathology;
- ability to be patient, inquiring, accurate, listen attentively, be persistent and self-motivated;
- good observation, interpretation and report-writing skills;
- an enjoyment of the scientific basis of medicine and research;
- the ability to communicate well orally and in writing;
- the ability and willingness to offer guidance and teaching to trainees in microbiology, medical, nursing and science undergraduate and postgraduate students

GENERAL AIMS OF THE TRAINING PROGRAM

The general aims of the training program are set out below and are elaborated as specific training outcomes and activities in **Section 2**.

By the time trainees complete the requirements for Fellowship, they should be able to:

- Competently use a microscope to examine specimens, troubleshoot problems, identify artefacts and staining problems and to ensure accurate and high quality material is available for the formulation of diagnostic opinions, as well as to be able to talk to scientific staff about the laboratory and its problems, and write a relevant report;
- Competently examine cultures, recognise contaminants, interpret antimicrobial susceptibility results and write a relevant report;
- Competently interpret serological and molecular microbiology techniques and write a relevant report;
- Apply and interpret laboratory information relevant to clinical care;
- Apply clinical information to cost effective laboratory practice;
- Participate in and advise as part of the infection control team;
- Function effectively as a team member;
- Demonstrate sufficient knowledge and personal communication skills to regularly participate in microbiology review meetings and clinical rounds;
- have a working knowledge of laboratory management procedures including budgeting and financial probity, safety and human resources;
- Understand the need for, and principles of, continuing education and participation in the continuing professional development program (CPDP);

- Be prepared and able to offer guidance and teaching to trainees in microbiology; junior medical staff and undergraduate students;
- Be open to research opportunities and applications;
- Demonstrate commitment to professional and ethical values in the workplace and in clinical practice

Furthermore, the RCPA policy on patient expectations of pathologists specifies that pathologists will:

- Demonstrate and maintain competence
- Be respectful of patients
- Treat specimens respectfully
- Foster constructive collegiality and teamwork within the laboratory
- Be part of the medical team looking after patients
- Provide accurate and timely results
- Be professional in their approach
- Be involved in appropriate accreditation and quality activities
- Provide value for public and private expenditure.

TRAINING REQUIREMENTS

RCPA Single Discipline Training

To gain the FRCPA in microbiology requires five (5) years of accredited training and satisfactory completion of the assessment program detailed below. No more than four (4) years in the one institution will be allowed. Trainees must spend a minimum of four (4) years under the supervision of a medical microbiologist in a laboratory accredited by the RCPA. The fifth year of training may involve clinical practice in infectious diseases or in another pathology discipline. Please refer to the *RCPA Trainee Handbook - Administrative Requirements* for essential information regarding training limitation, retrospective accreditation of training and temporary suspension of training

Research Stream

RCPA single discipline trainees who complete the Part I examination may opt to take a research stream for Part II training. They need to apply prospectively to the Board of Education and Assessment for approval of their application, project, laboratory and supervisor, and the research plan must be relevant and lead to a Doctorate by thesis. During the years spent on the thesis, trainees are expected to maintain competence in clinical general microbiology. Granting of Fellowship is conditional upon being awarded the PhD or MD degree. Research stream trainees must sit the Part II assessment, complete the required workplace based assessment tasks and submit a Portfolio of evidence that they have completed general clinical microbiology activities.

Joint Training in Microbiology and Infectious Diseases

A joint training program is available with the Royal Australasian College of Physicians (RACP). Joint training is a five-year training program combining two (2) years advanced infectious diseases training and three (3) years laboratory training in microbiology. Candidates may enter the joint program when they have completed all the requirements of Basic Physician Training. Joint trainees must be registered with and supervised by the Committee for Joint College Training (CJCT) in Microbiology and Infectious Diseases and registered with the RCPA.

Joint trainees are required to sit the same examinations as RCPA trainees in microbiology and to attain the same standard.

On completion of the five-year joint training program, trainees will be eligible for FRCPA and FRACP.

Components of Joint Training

The training period of 5 years is expected to encompass 2 years of core training in infectious diseases and 3 years in laboratory microbiology. These years can be undertaken in any order or, in some cases

trainees may occupy joint laboratory/clinical positions. In this case trainees will be required to nominate the breakdown of time sought for approval for each of the core infectious diseases or microbiology training.

- Core training in infectious diseases (2 years): The two required clinical years must be a comprehensive and structured program, prospectively approved by the Committee for Joint College Training. Exposure to inpatients and outpatients with a broad range of infectious diseases is required. There is a requirement to undertake two clinical projects while in advanced infectious diseases training. These must be commenced and relate to work undertaken in the two core clinical years of training. This is a requirement of the RACP and is separate and additional to the RCPA project requirements.
- Laboratory training in microbiology (3 years): Training in microbiology may only be undertaken in laboratories accredited with the RCPA Board of Education and Assessment and under approved supervision. It is expected that only a small proportion of time (approximately 10%) would be spent in direct patient care during this time. Joint trainees cannot elect laboratory research stream training.

Trainees will be expected to develop comprehensive knowledge and practical skills in all facets of microbiology and to be proficient at collection and handling of specimens and identifying the range of organisms expected to be encountered in a tertiary care hospital, with attention to safety and quality assurance.

Policies and Procedures for Joint Training

The Joint Training Program is managed by the Committee for Joint Training in Infectious Diseases and Microbiology (CJCT), which comprises representatives of the RCPA and RACP. Training is monitored through annual training program approval and accreditation after submission of the supervisor report each year. Please refer to *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) regarding the submission of forms to the CJCT and the RCPA.

RCPA policy is that trainees must spend at least one year of their five year program in a separate institution. Please refer to *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) regarding the training limitations. Joint trainees may not complete both their clinical and laboratory training entirely within one service of an institution. Alternative employment may occur either in the laboratory or the clinical component of joint training.

Trainees are strongly advised to consult the Royal Australasian College of Physicians (RACP) website for documents relevant to the RACP requirements for joint training.

SUPERVISION

All training must be supervised. More than one supervisor can be nominated if trainees divide the year between two or more unrelated laboratories. The College recommends that any one supervisor be responsible for no more than two trainees.

Who can be a supervisor?

The supervisor will normally be a Fellow of the RCPA; however non-Fellows may be approved by the Board of Education and Assessment if no Fellow is available. Normally, only one supervisor is nominated, but joint trainees may have an additional RACP supervisor. If the trainee spends significant periods working in an area where the supervisor has no personal involvement, the supervisor must certify that suitable supervision is being provided. The supervisor must also ensure that adequate supervision is arranged in their absence.

In some circumstances shared supervision may be necessary, but there must be a nominated primary supervisor with overall responsibility. Trainees working towards higher academic degrees (e.g. PhD), who find that their research supervisor is not suitable to be the RCPA training supervisor, should nominate an RCPA Fellow as co-supervisor.

While it is not appropriate for supervision to be delegated largely to a non-pathologist, it is appropriate for senior scientific staff with relevant experience to sign off some workplace-based assessment forms.

The role of the supervisor

Supervisors should devise a prospective training (or research) program, on initial registration and annually. This should be devised in collaboration with the trainee and submitted to the RCPA. Supervisors should also ensure that the trainee has sufficient time and opportunities to carry out the required training activities.

Supervisors, and others to whom aspects of training have been delegated, are expected to monitor and provide regular feedback on the development of the trainee's competence. In addition to the formal meetings with the trainee which should occur every three months, they should meet regularly with the trainee; observe their laboratory performance and interaction with scientists, peers and clinicians; and review result reporting. This may be delegated to other trainers where appropriate, eg. when the trainee is on secondment to another laboratory for a segment of training.

Detailed information about the formal duties of supervisors, such as requirements to report the Trainee's progress to the Board of Education and Assessment, are described in the RCPA Supervisor Manual and the RCPA policy on Supervision of Training and Accreditation of Supervisors. These and other resources for supervisors are available in the supervisors' section of the RCPA website.

ASSESSMENT

Assessment is by formal examination, workplace-based assessment, a portfolio of evidence of the trainee's achievements during training and the annual supervisor reports. The requirements are summarised below. **Please refer to the Appendices for detailed requirements.**

Formal Examinations

- Basic Pathological Sciences examination. Usually taken before or during the first year of training. All Trainees are required to undertake or apply for exemption from the Basic Pathological Sciences examination. Joint Trainees are an exception to this and are automatically exempt from the Basic Pathological Sciences examination. See **Appendix 1** for detailed requirements.
- Microbiology Part I Examination: emphasises the theoretical, practical and interpretative aspects of investigations in all fields of clinical Microbiology. The Part I examination is taken after at least 18 months of training in diagnostic and clinical microbiology. There are no automatic exemptions given to any Trainee for any component of the examinations. See **Appendix 2** for detailed requirements.
- Microbiology Part II Examination. Trainees who pass Part I are eligible to sit for the Part II examination, which is ordinarily sat in the final year of microbiology training. There are no automatic exemptions given for any component of the examination. See **Appendix 3** for detailed requirements.

All durations refer to full-time training or part-time equivalent in an accredited laboratory.

Projects

A major project and a minor project must be submitted before sitting for the Part II examination. See **Appendix 3** for detailed requirements.

The Portfolio and Workplace-based Assessment

The portfolio is a physical collection of assessment forms and other documents that provide evidence that trainees have successfully completed a range of activities that form part of their daily work in the laboratory. The portfolio records the trainee's progress in developing technical skills and professional values, attitudes and behaviours that are not readily assessed by formal examinations.

Trainees have responsibility for initiating the workplace-based assessments and ensuring that they have completed the required number by the required dates. They should identify suitable opportunities to have their competence assessed, negotiate a suitable time for the assessment with a suitably qualified assessor and provide the appropriate form. Assessments should be able to be done regularly without significant disruption to workplace productivity. It is important to refer to the detailed portfolio requirements in **Appendix 5**.

Supervisor reports

Trainees must submit to the College a supervisor report for each year of training, including periods of rotation. Copies of all reports should be kept in the portfolio.

LEARNING RESOURCES

Texts, journals and weblinks are in the [Microbiology](#) section of the RCPA website. Other peer-reviewed resources should be consulted as necessary for comprehensive coverage, especially contemporary reviews and key papers in the general microbiology literature.

Section 2

LEARNING OUTCOMES AND RECOMMENDED TRAINING ACTIVITIES

In Section 2, the four broad functions of microbiologists are elaborated as a list of training outcomes and activities. Where possible, learning outcomes are denoted as needing to be achieved early in training [E] or at a more advanced stage [A]. Competence in outcomes achieved early in training should be maintained throughout. Familiarity with new and emerging topics that may not appear in the Handbook is also expected.

Trainees are not expected to do every activity in the list. They should use their judgment to select those that are most likely to achieve the outcomes, being mindful of the range of learning opportunities offered by their particular laboratory.

1	DISCIPLINE-SPECIFIC FUNCTIONS AS MEDICAL SPECIALIST IN THE LABORATORY	7
1.1	Foundation knowledge	7
1.2	Public health and preventive medicine	8
1.3	Use of Antimicrobial Agents	9
1.4	Infection Control.....	9
1.5	Pre-analytic phase: specimen selection, collection & transport	10
1.6	Pre-analytic phase: selection of tests	10
1.7	Analytic phase: microscopy.....	11
1.8	Analytic phase: culture.....	11
1.9	Analytic phase: identification of microorganisms to species level	11
1.10	Analytic phase: non-culture detection of microorganisms (excluding microscopy).....	12
1.11	Analytic phase: susceptibility testing	13
1.12	Analytic phase: management of laboratory equipment and laboratory data.....	13
1.13	Post-analytic phase: report generation (Also see 4.3)	14
2	FUNCTIONS OF THE PATHOLOGIST AS MANAGER IN THE LABORATORY	15
2.1	Quality Management.....	15
2.2	Laboratory Safety.....	16
2.3	Compliance with legislation and institutional requirements.....	16
2.4	Managing People	17
2.5	Managing resources	17
2.6	Information fundamentals.....	18
3	RESEARCH AND SCHOLARSHIP	19
3.1	Research and critical appraisal	19
3.2	Undertaking Self-Education and Continuing Professional Development.....	20
3.3	Educating colleagues, staff, patients and families	20
3.4	Providing data for planning and evaluation.....	21
4	PROFESSIONAL QUALITIES	22
4.1	Ethics and confidentiality.....	22
4.2	Communication	22
4.3	Collaboration and teamwork.....	23
4.3	Cultural competence	23

1 DISCIPLINE-SPECIFIC FUNCTIONS AS MEDICAL SPECIALIST IN THE LABORATORY

Central to the role of the medical microbiologist is the interaction with the laboratory scientist who processes requests and the clinician who has requested the test or advice on behalf of the patient. Experienced medical microbiologists demonstrate a range of knowledge, skills and abilities, including:

- Synthesise laboratory and microbiological knowledge with clinical information to formulate and convey a plan of specimen management, reporting and result interpretation;
- Apply technical expertise in carrying out processing and reporting of sample results involving bacteria, fungi, viruses, parasites, infection control, serology, public health, antibiotic use and stewardship and use of molecular tests;
- Devise and conduct an effective system of laboratory management to ensure quality processing and reporting of samples;
- Coordinate laboratory and clinical information including the appropriate and cost effective collection of samples for further investigation and management of microbial treatment-related problems and participate in antimicrobial stewardship activities;
- Advise clinicians regarding test selection, interpretation and clinical application of microbiological test results;
- Participate in infection control and public health activities to promote the well-being of patients and the community, including advocacy for the appropriate use of vaccinations to control spread of disease;
- Facilitate and initiate clinic pathological research activities;
- Show antimicrobial stewardship by supporting, developing, teaching, participation in and implementation of antimicrobial control policy in the training institution.

By the end of training, trainees are not expected to have developed expertise in all these areas. However, they should be technically fully knowledgeable and competent in the routine aspects of the investigation and management of microbial treatment-related problems. They should also have observed and reflected on the way senior microbiologists fulfil the role of medical specialist in the laboratory and have participated in the more demanding aspects of the role as appropriate for the stage of training, assuming increasing levels of responsibility as they progress. They also should know how to access experts in all these areas and consider where their own interests lie and need to be developed to provide a value added clinical service in their areas of practice

The following lists of learning outcomes and activities are a guide as to what trainees should have achieved by the end of training.

1.1 Foundation knowledge

Outcomes

- [E] Taxonomy and biology of recognized, new and potential human pathogens, including ecology, evolution, metabolism (identification) and replication and treatment;
- [E] Principles of diagnostic medical laboratory identification to the species level of pathogens causing clinical disease, using manual or automated phenotypic, mass spectrometry and molecular methods, with emphasis on newer techniques;
- [E] Pathogenesis of infectious diseases, including host susceptibility and host responses;
- [E] Essential cellular and histological responses to infection;
- [E] Virulence mechanisms of human pathogens;
- [E] Microbial genetics and current and potential applications of genomics, bioinformatics and whole genome sequencing in the diagnostic microbiology laboratory;
- [E] Antimicrobial resistance emergence, detection and reporting, including an understanding of the nature and mechanisms of antibiotic resistance and the implications of these findings on treatment, infection control antimicrobial stewardship and public health, veterinary, and horticultural practices and the environment;

- [E] Principles of pharmacokinetics and pharmacodynamics and their application to the use of antimicrobial agents;
- [E] Effect of microbial biology and pathogenesis on the selection, sampling and testing of human tissue for diagnosis of microbial infections including a basic recognition of infective processes as identified in histopathological specimens;
- [E] Technical literacy associated with the selection, operation and maintenance of equipment used in the microbiology laboratory.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Attend relevant lectures, conferences, training weekends and web-based resources;
- Study authoritative texts and laboratory manuals;
- Review past written questions with supervisors;
- Develop training notes on the above areas in conjunction with experts in the fields;
- Under technical supervision, operate equipment used in the microbiological laboratory including that used for identification of organisms, monitoring blood cultures, antimicrobial susceptibility testing and detection of nucleic acids, antigens and antibodies, autoclaves, equipment used for the detection and measuring of blood levels of antibiotics and other relevant equipment;
- Prepare and/or undertake quality control of media;
- Refer to regulatory documents (eg. Security Sensitive Biological Agents) relevant to pathogen security.

1.2 Public health and preventive medicine

Learning outcomes

- [E] Notify the detection of infectious agents in accordance with local statutes;
- [A] Advise on detection, surveillance and intervention with respect to infectious diseases of public health importance;
- [A] Formulate strategies to investigate and manage outbreaks of infectious disease as part of a team of public health, infection control, infectious diseases physicians and microbiologists;
- [A] Ensure laboratory compliance with notification requirements;
- [A] Advise on immunisation of staff, patients and other relevant groups;
- [A] Maintain up to date knowledge of public health activities and emergence of diseases of public health importance.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg:

- Regular interaction with Public Health Units (or equivalent) to learn about procedures for outbreak investigation ;
- Attend work health and safety (WHS) committees, infection control/public health committees;
- Retrieve statistical information on notifiable diseases and resistant organisms from laboratory database, using CLSI or other appropriate guidelines, including rationale for selection and reporting of these;
- Read current relevant journals and data notifications, eg, by subscribing to ProMED, Ozbug, travel advice from the Australian Department of Foreign Affairs and Trade or other relevant data bases and journals (eg MMWR) as well as regular national and local public health reports of notifiable diseases (see Resources section for web links);
- Read current relevant local, national and international standards relating to microbiology, sterilisation and infection control;
- Formal, academic study, such as MPH, MEpi , which can be credited towards RCPA training time. Joint trainees should note that the RACP does not accredit courses undertaken prior to completing basic RACP training.

1.3 Use of Antimicrobial Agents

Learning outcomes

- [E] Understand mechanisms of action of all classes of antimicrobial agents in current widespread clinical use;
- [E] Maintain up to date knowledge of patterns and mechanisms of resistance, including the molecular basis, and implications for use of antimicrobial agents;
- [E] Apply principles of pharmacokinetics and pharmacodynamics to the use of antimicrobial agents;
- [E] Advise on selection, use, duration and monitoring of treatment with antimicrobial agents to patients, colleagues and institutional bodies;
- [A] Engage in antimicrobial stewardship by supporting, developing, teaching, participation in and implementation of antimicrobial control policy in the training institution.
- [A] Understand current national and global policy development on antimicrobial resistance control and prevention

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Read relevant and up to date articles and attend relevant meetings on the use and development of antibiotics and the emergence of antimicrobial resistance;
- Participate in, initiate and teach about measures to promote antimicrobial stewardship practices;
- Access relevant drug policies in training institution;
- Provide clinical advice on appropriate antibiotic use;
- Seek involvement in institutional drug committee activities, eg audits and meetings;
- Audit antibiotic use in collaboration with a pharmacist;
- Attend relevant sessions of RCPA update and access relevant RCPA on-line resources;
- Review laboratory antibiotic reporting policies and liaise with supervisors regarding suggested changes;
- Undertake laboratory audits on antimicrobial sensitivity testing and provide reports on trends in local and institutional antimicrobial sensitivity results linked with institutional and individual patient antibiotic use;
- Seek to participate in studies on new antibiotics either laboratory based or combined with clinical colleagues while maintaining awareness of the role and influence of the pharmaceutical companies in the process and declare any possible conflicts of interest.

1.4 Infection Control

Learning outcomes

- [E] Understand mechanisms of transmission of microbiological agents and the epidemiological basis of surveillance programs for infection control;
- [E] Understand the principles of sterilisation and disinfection;
- [E] Understand and comply with legislative and regulatory framework in geographic area of practice;
- [A] Advise on infection control measures to patients, colleagues and institutional bodies as part of the infection control team, including hand hygiene, central venous line blood stream infections (CVLBSI) and postoperative wound infection/surgical site infection, (POWI/SSI);
- [A] Implement, support and provide expert input into infection control policies in training institution;
- [A] Liaise between laboratory practice and infection control requirements, eg, outbreak surveillance, phenotypic or molecular typing.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant infection control policies in training institution;
- Access state and national guidelines, regulations and legislation;
- Observe, understand principles and prepare articles for sterilisation by various methods;
- Understand principles, observe the operation and monitoring of heat-sterilising apparatus and understand the safe and effective use of this equipment;

- Practise safe handling and disposal of biohazardous materials, chemicals and radioactive materials and other laboratory waste;
- Participate in institutional infection control committee activities, eg, audits and meetings;
- Participate in infection control rounds, investigation of outbreaks or case reviews/audits of hospital acquired investigations;
- Prepare reports of institutional infection outbreaks and forward to relevant personnel after discussion with supervisor and infection control team.
- Maintain knowledge of current literature and innovations in infection control.

1.5 Pre-analytic phase: specimen selection, collection & transport

Learning outcomes

- [E] Understand how the biology of microorganisms and pathogenesis of infection influences the optimal sampling of human tissue for diagnosis;
- [E] Advise on and review methods for the selection, collection and transport of specimens so as to optimize diagnostic yield, based on up to date knowledge of developments in this area and knowledge of the regulatory framework;
- [E] Review samples designated as “not for testing” to ensure that rejecting these samples is justifiable and communicate with the relevant requestor to educate and inform them as to why the samples were so designated and confirm that the decision is acceptable to the treating clinicians;
- [E] Triage, examine and set up specimens;
- [E] Solve problems in unusual situations;
- [A] Prepare standard operating procedure (SOP) documents to fill any gaps identified in the laboratory manual in consultation with supervisor and in line with the current laboratory SOPs.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg:

- Access relevant sections of the laboratory manual;
- Ensure appropriate collection and transport of specimens and clinical advice by reviewing specimens designated “not for processing” and samples of tissue for microbiology processing;
- Write relevant referral letters to accompany selected important samples referred to a reference laboratory;
- Maintain up to date knowledge of the literature, regulations and innovations in methods of specimen selection, collection and transport;
- Participate in RCPA QAP or similar external QAP activities undertaken by the laboratory.

1.6 Pre-analytic phase: selection of tests

Learning outcomes

- [E] Advise on the optimal diagnostic algorithm (eg samples to be collected, tests to be undertaken, time for a result to be available, costs) for a given clinical problem;
- [E] Resolve uncertainty in situations not addressed by the laboratory manual;
- [E] Contribute to the evaluation and implementation of new and existing tests and new equipment.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Supervised clinical liaison;
- Access relevant sections of the laboratory manual;
- Execute tests and participate in other relevant laboratory activities;
- Maintain up to date knowledge of the literature and innovations in microbiological testing;
- Compile reports on participation and resolution of uncertainties to assist laboratory to improve standard operating procedures and quality manuals in consultation with supervisor;
- Participate in RCPA QAP or similar external QAP activities undertaken by the laboratory.

1.7 Analytic phase: microscopy

Learning outcomes

- [E] Prepare specimens for microscopy;
- [E] Examine material stained with routine stains using light and digital microscopy, demonstrating an understanding of the principles involved
- [E] Interpret microscopic findings appropriately, demonstrating awareness of pitfalls and the limitations of the techniques;

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual;
- Participate in laboratory activities including, but not limited to:
 - prepare faecal and other parasite stains and concentrates
 - identify ova cysts and parasites;
 - prepare and examine skin scrapings and other tissues for fungal examination;
 - prepare and examine specimens by Gram's, acidfast, toluidine blue, India ink, Giemsa, fluorescent antibody stains, and other stains which may be relevant to local practice;
 - prepare and examine blood films for blood-borne parasites;
 - attend, observe and undertake the above activities with the relevant laboratory section responsible for any of the above activities if not part of the routine microbiology laboratory activities;
- Participate in RCPA QAP or similar external QAP activities undertaken by the laboratory.

1.8 Analytic phase: culture

Learning outcomes

- [E] Understand the principles and quality control requirements of media preparation and supply;
- [E] Select media appropriately for specimen inoculation according to laboratory protocols;
- [E] Select appropriate atmosphere, temperature and duration of culture;
- [E] Process specimens appropriately;
- [E] Recommend problem solving strategies in the event of unexpected results.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual;
- Participate in laboratory activities, including but not limited to:
 - Observe and prepare culture media and agar plates;
 - Review the regular and boutique media available in the laboratory, the media quality control and test organisms especially for bulk media purchased from outside the training institution;
 - Plate out clinical specimens;
 - Set up anaerobic cultures;
 - Set up pure cultures from mixed growth on a primary plate;
 - Maintain and inoculate tissue culture for virus isolation;
 - Detect viral replication in tissue culture;
 - Prepare mycological slide cultures;
- Maintain up to date knowledge of the literature and innovations in culture methods;
- Participate in RCPA QAP or similar external QAP activities undertaken by the laboratory

1.9 Analytic phase: identification of microorganisms to species level

Learning outcomes

- [E] Correctly select significant organisms and identify them by colony and cell morphology, biochemical, mass spectrometry, molecular and other methods, both manual and automated;
- [E] Explain the basic principles of phenotypic and biochemical identification;
- [E] Understand the principles of mass spectrometry, prepare specimens and understand the generation of spectral scores, operation of the equipment and necessary troubleshooting including the software and interfaces;

- [E] Understand the theory and processes of molecular identification and essential bioinformatics related to molecular sequences, the limitations of molecular techniques and the pitfalls of online databases;
- [E] Understand the strengths, limitations and applications of current and emergent methods for microbial identification and justify the most appropriate approach in a given situation;
- [E] Apply problem solving strategies or recommend alternative approaches in the event of unexpected or inconclusive results.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual.
- Access relevant text books, journals and internet to assist with organism identification;
- Attend meetings, seminars, symposia, etc, dealing with current and emerging methods in microbiology;
- Participate in laboratory activities, including but not limited to:
 - Recognise the colonial and microscopic appearance of commonly encountered or medically important organisms (ie, phenotypic methods of identification);
 - Perform and interpret tests commonly used to identify microorganisms;
 - Determine viable counts in bacterial suspensions;
 - Use automated apparatus to detect bacteraemia and identify microbes;
 - Identify medically important fungi;
 - Use phenotypic and biochemical methods to identify organisms unable to be identified by mass spectrometry or molecular methods;
- Undertake audits of selected isolates and methods of detection, and suggest updates if relevant;
- Participate in RCPA QAP or similar external QAP activities undertaken by the laboratory.

1.10 Analytic phase: non-culture detection of microorganisms (excluding microscopy)

Learning outcomes

- [E] For serological assays, know the principles of manual and automated methods, their applications, limitations and technical factors affecting validity and interpretation;
- [E] For molecular biologic assays, know the principles of manual and automated methods, their applications, limitations and technical factors affecting validity and interpretation;
- [E] Recommend problem solving strategies in the event of unexpected or inconclusive results

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual;
- Participate in laboratory activities, including but not limited to preparing, reading and interpreting assays for the detection of antigens and antibodies, including manual and automated methods such as:
 - agglutination
 - precipitation
 - immunoassay
 - complement fixation
 - immunofluorescence
 - immunoblotting
 - Rapid, eg, strip tests
- Review literature related to historical development of serological tests, automation and manual tests;
- Appraise the role of near patient /point of care tests and the microbiology laboratory
- Understand the principles of molecular diagnostics and participate in laboratory activities, including but not limited to:
 - The design and maintenance of molecular suites
 - The appropriate specimen type and collection methods used
 - The extraction of nucleic acids from specimens;

- The running of and trouble-shooting of polymerase chain reaction (PCR) assays;
- The interpretation of real time polymerase chain reaction (PCR) graphs;
- The principle and methods used in sequencing of nucleic acids of microbes;
- Understand the requirements for detection of 16s rRNA, 18s rRNA etc in relevant samples and the use and limitations of these and other relevant microbial molecular tests.
- Participate in RCPA Quality Assurance Programs Pty Ltd (QAP) or similar external quality assurance activities undertaken by the laboratory.

1.11 Analytic phase: susceptibility testing

Learning outcomes

- [E] Understand principles, theory and limitations of susceptibility testing and interpretations of breakpoints
- [E] Be able to carry out under supervision, manual, molecular, automated and other relevant methods in relation to antibiotic susceptibility testing and detection of resistance mechanisms;
- [E] Observe and understand the principles of antifungal and antiviral susceptibility testing.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual
- Participate in laboratory activities, including but not limited to:
 - Prepare and interpret antibiotic susceptibility tests;
 - Detect beta-lactamases and other bacterial enzymes;
 - Determine the synergy between combinations of antibiotics;
 - Perform antimicrobial assays on blood and body fluids by bioassay or other methods;
- Participate in laboratory activities, including but not limited to:
 - Observe and interpret antifungal susceptibility tests;
 - Determine synergy between combinations of antifungal agents;
 - Observe and interpret antiviral susceptibility testing.
- Observe and determine relevant test methodology, for example
 - Automated testing;
 - Disc-diffusion testing MIC determination using eTest, microbroth or agar dilution
 - Molecular detection of resistance factors;
- Utilise relevant quality control/quality assurance methods to validate all results.

1.12 Analytic phase: management of laboratory equipment and laboratory data

Learning outcomes

- [E] Understand principles, communicate with scientific staff members and laboratory managers, and provide expert input regarding the operation and maintenance of laboratory equipment.
- [E] Collaborate in the application of problem solving strategies in the event of unexpected results or equipment failure.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual;
- Maintain current knowledge by reading relevant journals and text books; to supplement laboratory manuals;
- Participate in relevant sections of the laboratory;
- Use and maintain (under supervision) laboratory equipment, including but not limited to:
 - incubators
 - centrifuges
 - safety cabinets
 - refrigerators
 - freezers (-20°C, -80°C)
 - liquid nitrogen
 - autoclaves
 - hot air ovens

- microscopes
- anaerobic cabinets
- Gram staining equipment
- microwaves
- water baths
- heating blocks
- automated equipment used in serology, NAA testing, bacterial/fungal ID and susceptibility testing

1.13 Post-analytic phase: report generation (Also see 4.3)

Learning outcomes

- [E] Communicate and interpret results to clinicians,(initially under supervision pre part 1) including urgent results;
- [A] When reporting, comply with principles involved in the formulation of an opinion and generation of a laboratory report, including review, synthesis and interpretation of all relevant clinical and laboratory information (including quality control data) pt 2;
- [A] Report in accordance with the relevant regulatory framework;
- [A] Utilize concepts of selective reporting and antimicrobial stewardship, including reasons for testing and instances where special tests are needed or indicated;
- [A] Use the laboratory information system to develop and apply algorithms and rules for the production of results, interpretative comments and recommendations for further tests and alerts for non-routine action.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access relevant sections of the laboratory manual;
- Maintain current knowledge by reading relevant journals and text books to supplement laboratory manuals;
- Participate in laboratory activities, including but not limited to:
 - record, verify and interpret laboratory test results
 - Identify parameters of measurement uncertainty
 - develop and apply action limits
 - notify abnormal results to pathologists and clinicians
 - appraise quality control relevant to result;
 - assess relevance of the result in conjunction with previous laboratory data, clinical history and response to therapy prior to finalization of the microbiology laboratory result;
- Participate in teaching, grand rounds, clinical rounds and contribute effectively to these;
- Review relevant reports from RCPA Quality Assurance Programs Pty Ltd (QAP).

2 FUNCTIONS OF THE PATHOLOGIST AS MANAGER IN THE LABORATORY

With growing experience, medical microbiologists are expected to assume managerial responsibilities in the laboratory. In this role they are expected to:

- Apply clinical information to cost effective laboratory practice;
- Supervise and manage the microbiology laboratory safely and effectively in the context of finite resources;
- Ensure effective work practices through staffing and by developing policies and procedures based on appropriate use of information and evidence;
- Demonstrate leadership in an organisation to promote safe patient care.

By the end of training, trainees are not expected to be fully competent in all these areas, however they are expected to have become familiar with managerial tasks by observing and reflecting on the duties of senior microbiologists and to have participated in managerial activities that are appropriate for their stage of training, assuming increasing levels of responsibility as they progress.

The following lists of learning outcomes and suggested activities are a guide as to what trainees should have achieved by the end of training.

2.1 Quality Management

Learning outcomes

- [E] Understand principles and practices related to quality management required in the laboratory;
- [E] Understand accreditation requirements and participation in these;
- [E] Understand external quality assurance requirements and participation in these;
- [E] Promote timely and appropriate use of pathology investigations;
- [E] Apply risk management strategies to minimise errors.
- [E] Document, notify and apply corrective actions, employing laboratory information systems where appropriate, in the event of incidents, errors and adverse events
- [E] Advise on retention and preservation of biological materials including specimens, bacterial, fungal isolates;
- [E] Execute quality controls for common tests, reagents and media;
- [E] Recognise when quality controls have failed and institute remedial action
- [A] Apply, review and plan quality assurance strategies for monitoring processes and outputs in the microbiology laboratory
- [A] Be familiar with the roles and requirements of relevant local, national and international laboratory accreditation bodies and standards (including ISO 900 and ISO 15189) and know how to access specific details.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Review summaries of relevant requirements for lab accreditation and performance, for example the NATA Checklist for Laboratory Accreditation or equivalent checklists in other jurisdictions;
- Participate in case/slide/laboratory/clinical rounds, peer review meetings;
- Participate in external quality assurance (e.g. RCPA QAP) activities;
- Read current literature on QA strategies, risk management, informatics and evidence based medicine in microbiology laboratories.
- Participate in workflow checks to ensure effective and efficient laboratory function;
- Recognise, report and analyse quality problems when they arise in the laboratory;
- Participate in implementing plans for testing and evaluating measures to improve the quality of laboratory practice and patient care;
- Clinical or case audit, including reviews of methods, and present to the laboratory;
- Complete the [Quality Management eLearning module](#) in RCPA Education Online and print the certificate of completion for your portfolio
- Participate in RCPA committees or represent RCPA on institutional committees.
- Participate in auditor training and practice;

- Access relevant websites and review the roles of the National Pathology Accreditation Advisory Council (NPAAC), National Association of Testing Authorities (NATA) or International Accreditation New Zealand (IANZ), ISO 900, ISO 15189 or other relevant local, national and international laboratory accreditation bodies and registration requirements

2.2 Laboratory Safety

Learning outcomes

- [E] Understand laboratory safety procedures, to protect self and others against infection, radiation, toxic, gas, chemical, electrical and fire hazards;
- [E] Be familiar with safety manual and action plans;
- [E] Be familiar with actions for exposures and their currency;
- [E] Apply biosafety training and management when handling all microbial samples especially those deemed to be biosafety threats;
- [A] Analyse incident reports and near misses to identify opportunities for improvements in practice;
- [A] Contribute to the management of staff needs in the event of an adverse event in the laboratory;
- [A] Evaluate processes for assessing risk, investigating and reporting hazards, in accordance with legal aspects of investigation and disclosure after an event;
- [A] Be familiar with the requirements of safety standards relevant to jurisdiction (e.g. AS/NZS 2243.3)
- [A] Provide expert input into the documented requirements and implementation of safety procedures in the laboratory

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Complete the Safety checklist in **Appendix 8** of this Handbook (mandatory activity)
- Participate in biosafety training immediately upon commencing work in the laboratory;
- Participate in orientation program for new staff members as soon as practicable after commencing appointment;
- Schedule meeting with workplace health and safety (WHS) Officer early in appointment;
- Participate in regular occupational health and safety drills and meetings, especially fire safety according to institutional requirements usually annually and update as required by the institution;
- Participate in training to use equipment for biological, chemical and fire safety, first aid and resuscitation;
- Prepare or review incident reports and explore improvements if relevant;
- Report incidents and accidents as required by local protocol;
- Follow relevant infection control processes and reporting in the laboratory;
- Wear appropriate safety (personal protective) equipment when in the laboratory;
- Ensure relevant personal vaccinations are completed prior to commencement of duties;
- Report breaches in laboratory safety protocols;
- Complete the [Laboratory Safety eLearning module](#) in RCPA Education Online and print the certificate of completion for your portfolio
- Be familiar with [Security Sensitive Biological Agents](#) (SSBA) Regulatory Scheme (Australian Government site).

2.3 Compliance with legislation and institutional requirements

Learning outcomes

- [A] Be familiar with legal requirements relevant to jurisdiction and acceptable standards relating to performance of and billing for pathology services
- [A] Demonstrate basic knowledge of funding mechanisms in the public and private sectors in the jurisdiction of practice;
- [A] Operate with awareness of the potential for medical litigation and the role of pathologists as defendants or consultants, and apply appropriate risk management strategies;
- [A] Ensure laboratory compliance with current local or national requirements for notifiable diseases;
- [A] Comply with current legal requirements for notifiable diseases relevant to jurisdiction;
- [A] Demonstrate knowledge of local, national (e.g. Australian Dangerous Goods Code or equivalent elsewhere) and international regulatory frameworks surrounding the collection, packaging, transport, storage, and disposal of microbial specimens and microbiological materials.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Review reports and seek advice from appropriate senior staff;
- Locate sources of information relating to pathology financing, billing and legal aspects of professional practice, e.g. Medicare Benefits Schedule, Health Insurance Act, Approved Pathology Provider undertakings (Australia) or other documentation relevant to your jurisdiction;
- Document incidents and discussions with medicolegal implications and discuss with supervisor or a senior colleague;
- Review laboratory manuals and State/Territory/country legislation regarding notifiable diseases;
- Maintain currency with the relevant requirements for notifiable diseases;

2.4 Managing People

Learning outcomes

- [E] Be familiar with orientation and training protocols for new staff;
- [E] Display skills in avoiding, managing and resolving conflict in the workplace;
- [E] Be familiar with the RCPA policy on bullying and harassment. Refer to Appendix 1 of the *RCPA Trainee Handbook - Administrative Requirements*
- [E] Behave in accordance with equal opportunity and anti-discrimination practices in the workplace;
- [E] Understand and practice the role of working in teams and the importance of valuing all staff.
- [A] Understand workflow and the roles of staff members in order to review standard operating procedures, introduce new tests and optimise efficiency whilst maintaining or enhancing job satisfaction and motivation.
- [A] Develop the skills needed to mentor, supervise and provide constructive feedback to staff;

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Participate in staff and business meetings in the Department;
- Observe administrative procedures in relation to selection and appointment of staff;
- Observe administrative procedures concerned with rosters;
- Participate in training on giving and receiving feedback and/or read articles on the subject;
- Participate in a conflict resolution course and/or read articles on the subject;
- Reflect on observations of interactions in the workplace, especially those concerned with biosafety and those with the potential to involve conflict;
- Assist in the orientation and mentoring of junior colleagues;
- Take opportunities to participate as trainee representative on College and State/regional committees;
- Complete the 6 [Ethics eLearning modules](#) in RCPA Education Online (mandatory). Complete relevant activities from the [Monash University Clinical Ethics Resource](#) (optional).
- Attend local courses where available and funded including but not limited to:
 - staff appraisal;
 - staff selection and review;
 - the exit interview;
 - conflict management;
 - equal opportunity processes;
 - anti-discrimination.

2.5 Managing resources

Learning outcomes

- [A] Communicate effectively with managers regarding budgetary considerations in an established microbiology laboratory;
- [A] Collaborate with managers in the assessment, procurement, installation, maintenance and use of laboratory equipment and electronic information systems in the laboratory environment and evaluation of cost-effectiveness;
- [A] Be aware of sources of funding for laboratory testing;
- [A] Contribute advice to reduce expenditure without reducing quality;

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Review laboratory budget reports including income, expenditure, salary, overtime, annual leave and sick leave costs, maintenance and consumables costs and discuss with senior staff any discrepancies noted or ideas to ensure budget integrity;
- Participate as an observer in committees concerned with resource management;
- Teach colleagues to use new laboratory equipment and IT software and hardware;
- Attend training sessions concerned with implementing new technology;
- Attend RCPA Management Course or local courses where available and funded including but not limited to reading financial statements and budgeting.

2.6 Information fundamentals

Learning outcomes

- [E] Use laboratory information systems in recording patient and request information, including a storage and retrieval system for specimens, results, comments and final reporting.
- [E] Recommend and use standardised information structures, terminology and units for requesting and reporting;
- [E] Understand statistical concepts, methods and tools used to assess the accuracy, uncertainty, variation and reproducibility of test results, including data for both individual patients and populations, and to be able to determine confidence levels, reference or expected values and the clinical significance of testing;
- [E] Understand the role and scope of informatics in laboratory medicine, including concepts of information architecture, quality and analysis, systems design, and specialised sub-domains such as bioinformatics, imaging and statistics;
- [E] Explain the basics of laboratory systems architecture and the movement of data for communication of requests, reports and instrument interfacing;
- [E] Identify the information technology environment in which the laboratory information system operates, including integrated systems (i.e. hospital information systems, back-ups, reporting and network structure);
- [E] Describe meaningful and secure use of electronic health records in pathology practice;
- [A] Explain evidence-based advice, guideline development, prediction and research, and describe the knowledge and information tools that can be used to help with this;
- [A] Conform to specimen indexation conventions of the laboratory and use laboratory information systems to retrieve reports/specimens for examination and review to satisfy clinical audit and/or research purposes.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access and read documents and view video presentations relating to informatics to be found in RCPA Education Online
- Develop computer knowledge (undertake courses) and use this knowledge to assist with effective teaching, audits, reviews;
- Understand the functions, limits and potential of LIS in enhancing efficient management and providing better reporting and decision support for an effective laboratory;
- Participate in departmental and clinical meetings;
- Network and share information with colleagues;;
- Plan, organise and review teaching activities, together with supervisor, peers and laboratory staff;
- Participate in College activities and meetings.

3 RESEARCH AND SCHOLARSHIP

Professional microbiologists have responsibilities with regard to the processes of scientific inquiry, research and education. They are expected to:

- Maintain professional competence throughout their careers, by keeping up to date with new knowledge in technical aspects of microbiology and other aspects of the roles of medical microbiology professionals, and integrating this knowledge in their practice;
- Contribute to advancing knowledge and/or enhancing practice in microbiology;
- Critically appraise scientific literature and research;
- Contribute to the collection, analysis and interpretation of data relating to the quality of health care;
- Contribute to the education of peers, trainees, other health care providers and to the understanding of microbiology by the general community.

By the end of training, trainees should be able to critically appraise scientific literature and research in microbiology and be sufficiently skilled in scientific inquiry to conduct a small scale laboratory investigation or participate in a larger-scale research study. They should have developed the self-discipline to support the habit of lifelong self-education. Through personal experience and observation they should have sufficient understanding of teaching and learning to be able to mentor and supervise junior staff and to conduct educational sessions for colleagues and for the general community .

The following lists of learning outcomes and suggested activities are a guide as to what Trainees should have achieved by the end of training.

3.1 Research and critical appraisal

Learning outcomes

- [E] Critically appraise sources of medical information, discriminating between them in terms of their currency, format, authority and relevance;
- [E] Develop the ability to ask research questions, plan and perform research; and be familiar with research tools and approaches used by basic laboratory scientists;
- [E] Apply and interpret basic statistical and epidemiological concepts and data;
- [E] Collaborate with and acknowledge clinical colleagues.
- [A] Develop a personal strategy, using IT software where appropriate, to discover, store, access and share information resources;
- [A] Demonstrate skill in developing a research proposal, conducting appropriate research activities and writing up for peer review/publication;
- [A] Comply with the requirements of relevant bodies concerned with ethics in human and animal research;
- [A] Prepare reports and papers for publication that comply with the conventions and guidelines for reporting biomedical research;
- [A] Contribute to data analysis and publication in the department.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- During training undertake at one major and one minor project under supervision post completion of microbiology Part I assessment (MB1). These should be of publishable quality and written up for submission for publication;
- Participate in and present cases, reviews, original work, to peers at grand rounds, specialist meetings, journal club, etc;
- Attend research meetings;
- Contribute to writing research proposals and ethics submissions post MB1;
- Use clinical and laboratory databases for research for collecting, organizing and analysing data;
- Use a standard bibliographic application (e.g. EndNote) to download citations from a literature search and organise them into a personal database;
- Read reference material on basic statistical concepts including distribution, mean, median, standard deviation, statistical significance, confidence intervals, correlation, sensitivity, specificity, predictive values, incidence and prevalence;

- Consult a medical librarian, statistician or researcher;
- Prepare articles for publication;
- Give oral and poster presentations at scientific meetings
- Use the [research and scholarship resources](#) in RCPA Education Online:

3.2 Undertaking Self-Education and Continuing Professional Development

Learning outcomes

- [E] As part of a personal continuing education strategy, practice the habit of identifying and documenting own learning needs, planning educational strategies to meet them, monitoring achievements through self-assessment and reflecting on the outcomes;
- [E] Identify personal learning preferences and reflect on how effective they are in developing competence;
- [A] Demonstrate up to date knowledge of and ability to appraise medical and pathological literature and innovations in areas relevant to microbiology.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Formulate a personal learning plan and participate in continuing professional development activities;
- Complete an online learning style inventory and explore a variety of ways to learn;
- Apply various computer-based instructional tools, such as electronic tutorials for confirming or updating knowledge and skills;
- Review RCPA CPDP documentation to identify and apply activities and recording strategies that may be applicable;
- Select relevant mentors to guide professional activities;
- Regularly review journals relevant to microbiology and participate in or lead discussions on contemporary issues;
- Present personal work at clinical and pathology educational meetings and journal clubs.

3.3 Educating colleagues, staff, patients and families

- [E] Prepare and deliver educational sessions, incorporating the principles of adult learning, using effective oral, visual or written modes, and reflect on their effectiveness;
- [E] Contribute to the informal education of laboratory personnel, peers, medical students and other health professionals;
- [E] Translate and convey microbiology-related concepts and information in an understandable manner to non-microbiologists;
- [E] Promote understanding of health and disease, including relevant epidemiology and public health issues, to patients, clinicians and the community.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Participate in and contribute to departmental teaching sessions, clinic-pathological and other institutional meetings;
- Prepare posters, presentations, articles of scientific investigations in pathology and present to peers and other health professionals;
- Develop assessment or educational modules for RCPA;
- Review or develop educational materials for non-pathologists, eg, Lab Tests Online
- Facilitate patient education if relevant to discipline;
- Mentor students and other trainees and advise on effective preparation for examinations;
- Read and discuss articles on effective teaching strategies;
- Participate in training on the effective teaching and supervision of adult learners in laboratory and clinical settings, such as the “Teaching on the Run” program;
- Seek evidence of own teaching effectiveness.

3.4 Providing data for planning and evaluation

Learning outcomes

- [A] Identify requirements for reporting and costing of clinical and laboratory information and requirements in the provision of new or outbreak services.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Assemble costing and test selection and possible test numbers information to assist in health service planning;

4 PROFESSIONAL QUALITIES

Medical microbiologists are required to uphold the legal and ethical responsibilities of the profession and to behave with diligence, integrity and compassion. Their concern for patient safety and the reputation of the profession should be evident in their daily practice. They should:

- Maintain their professional competence throughout their career;
- Act with honesty, trustworthiness, diligence and integrity at all times.
- Conduct respectful communications with colleagues, patients and others;
- Be skilled in a variety of modes of communication and able to use them appropriately depending on the circumstances;
- Establish and maintain co-operative relationships with colleagues, patients and others in health services.

During training, trainees should reflect on and strive to adopt the attitudes and values that underpin professional practice and take advantage of opportunities to extend themselves in these areas so that by the end of training, they are fully able to assume their professional responsibilities.

The following lists of learning outcomes and suggested activities are a guide as to what Trainees should have achieved by the end of training.

4.1 Ethics and confidentiality

Learning outcomes

- [E] Practice ethically, which includes:
promptness of reporting;
interacting appropriately with clinicians, laboratory staff and other health professionals;
knowing when to seek opinion from others;
financial probity;
- [E] Comply with legal, ethical and medical requirements relating to patient records and documentation, including confidentiality, informed consent and data security;
- [E] Differentiate between ethically appropriate and ethically inappropriate procedures and actions;
- [E] Identify appropriate courses of action in regard to unprofessional conduct by or ill health in a colleague;
- [E] Comply with copyright and intellectual property rules;
- [E] Describe strategies to ensure equity of access to pathology testing for patients;
- [E] Advocate for, and protect, patient rights.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Review appropriate literature and guidelines including the National Patient Safety Education Framework;
- Read the most recent Australian Medical Association Code of Ethics;
- Access and read documents relating to cultural competence, including those concerning indigenous people, such as Aboriginal and Torres Strait Islander and Maori people;
- Reflect on professional behaviour of self and others, identifying potential for ethical dilemmas and strategies to deal with them;
- Complete the 6 [Ethics eLearning modules](#) in RCPA Education Online (mandatory)
- Complete the [Monash University Clinical Ethics Resource](#) (optional)

4.2 Communication

Learning outcomes

- [E] Employ effective oral, written and electronic communication strategies, including the production of concise, grammatically correct written reports;
- [E] Use appropriate language in all communications, showing awareness of cultural and linguistic diversity;

- [E] Demonstrate good interpersonal communication skills such as active listening and accepting and offering appraisal;
- [E] Comply with guidelines for handling sensitive information;
- [E] Advise laboratory staff about testing methodologies, quality assurance techniques and delineating protocols for the issuing of results;
- [E] Communicate appropriately with scientific staff in the laboratory;
- [E] Advise clinicians on the choice and performance of laboratory procedures and the interpretation and relevance of pathological findings, taking into account clinicians' and patients' needs;
- [E] Consult with clinical specialists and pathologists on issues of patient care and professional practice and in seeking and providing referral opinion on difficult cases.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Participate in training sessions on communications, cross-cultural communications, presentation skills, etc;
- Compose written reports at an appropriate level of responsibility and seek feedback from supervisor, colleagues and clinicians;
- Document telephone communication of pathological findings, interpretations, clarification of requests and complaints where appropriate, seeking feedback from supervisors and colleagues;
- Read documents relating to etiquette and proper use of electronic communications such as email;
- Consult style guides for correct use of grammar and terminology for written communications;
- When making oral presentations, take advantage of opportunities to raise the level of challenge by making formal presentations to people you don't know well.

4.3 Collaboration and teamwork

Learning outcomes

- [E] Contribute effectively to the activities of laboratory and health care teams, recognizing responsibilities and limitations of own role;
- [E] Consult and collaborate with laboratory scientists, other laboratory colleagues, laboratory informaticians, other medical practitioners and health care professionals;
- [E] Contribute effectively to inter-disciplinary team activities, such as peer review sessions and other education and quality activities, recognizing responsibilities and limitations of own role;
- [E] Promote the role of pathologists and microbiologists as vital contributors to patient care.

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Identify the elements of an effective team and reflect on your observations of teams in your work place and others with which you interact;
- Network and share information with colleagues, using available technologies;
- Plan, organize and review teaching activities, together with supervisor, peers and laboratory staff;
- Participate in mentoring programs;
- Participate in College activities and meetings;
- Participate in departmental and multidisciplinary meetings;
- Participate in collaborative research and prepare collaborative publications.

4.3 Cultural competence

Learning outcomes

- [E] Demonstrate an awareness of cultural diversity and the ability to function effectively, and respectfully, when working with and treating people of different cultural backgrounds. Diversity includes but is not limited to ethnicity, gender, spiritual beliefs, sexual orientation, lifestyle, beliefs, age, social status or perceived economic worth.
- [E] Apply knowledge of population health, including issues relating to health inequities and inequalities; diversity of cultural, spiritual and community values; and socio-economic and physical environment factors; to specialist pathology practice

- [E] Apply knowledge of the culture, spirituality and relationship to land of Aboriginal, Torres Strait Islander and/or Māori peoples to specialist pathology practice and advocacy

Activities

Select activities that are appropriate to your training environment and, if relevant, keep a record for your portfolio, eg,

- Access and read documents relating to cultural competence, including those concerning indigenous people, such as Aboriginal and Torres Strait Islander and Maori people;
- Complete the [Cultural Competence eLearning modules](#) in RCPA Education Online and print the email verifying completion of the relevant module/s for your portfolio OR provide evidence of having completed the cultural competence activities required by your employer, if a registered health services provider.
- Participate in departmental and clinical meetings;
- Network and share information with colleagues;;
- Plan, organise and review teaching activities, together with supervisor, peers and laboratory staff;
- Participate in mentoring programs;
- Participate in College activities and meetings.

Section 3

Appendices

Appendix 1 Basic Pathological Sciences Examination	26
Appendix 2 Part I assessment.....	27
Appendix 3 Part II assessment	30
Appendix 4 Guidelines for completing the Supervisor Report Form	34
Appendix 5 Portfolio Requirements	35
Appendix 6 Forms and logbook pages	37
Appendix 7 Major project proposal and project guidelines.....	51
Appendix 8 Minor project guidelines.....	55
Appendix 9 Assessment matrix	57

Appendix 1

Basic Pathological Sciences Examination

All trainees must pass or be [exempted](#) from the Basic Pathological Sciences examination. The examination may be taken before commencement of training and is open to registered trainees as well as any medical graduate or medical student.

Although a pass in Basic Pathological Sciences is not a prerequisite for attempting Part I examination, a pass or exemption must be achieved before proceeding to sit the Part II examination.

The purpose of the Basic Pathological Sciences Examination is to assess familiarity with the most important pathological processes and biological principles of disease that form essential knowledge for any medical graduate who considers a career in the pathological disciplines.

The examination has become necessary because pathology may no longer be taught as a “core” discipline in some Australasian medical schools, hence an understanding of basic patho-biological processes is no longer guaranteed in many medical graduates. Such knowledge is essential for a successful start and satisfactory progress in the training program.

Examination Format and Content

The examination is a single 2.5 hour paper of 100 one-best-answer multiple choice questions, based on the [BPS syllabus](#) on the RCPA website

The syllabus reflects knowledge that appears in current, authoritative texts as well as newer knowledge that may not yet appear in textbooks.

The topics cover the basic mechanisms of disease that trainees need to understand so they are equipped to train in their chosen discipline and to understand pathology disciplines other than their own chosen field. To cite just a few examples, the microbiology trainee needs to know what a septic infarct looks like; the chemical pathology trainee needs to know about the anatomical pathology changes seen in metabolic syndrome; the anatomical pathology trainee needs to understand why certain antibodies are used in routine diagnosis and the genetic pathology trainee needs to understand how enzyme deficiencies may lead to morphological changes.

The syllabus is primarily based on Chapters 1-11 of the Professional Edition of Robbins and Cotran Pathologic Basis of Disease (9th ed. 2015. Elsevier) by Abul K. Abbas, Vinay Kumar, and Jon C. Aster. References to supplementary materials are also given, which explain details more clearly than the textbook or contain helpful diagrams. As much as possible these references are from Open Access journals, but for copyright reasons the actual articles are not able to be placed on the College website.

Appendix 2

Part I assessment

Assessment in Part I for RCPA single discipline trainees and for Joint Trainees is by

- Formal examinations
- A portfolio of evidence of having participated in a sufficient number and type of activities
- Satisfactory progress (supervisor reports)

See assessment matrix in Appendix 9.

Examinations are prepared in accordance with [RCPA Guideline 3/2015 Quality Framework for RCPA Examinations – Written, Practical and Oral](#).

Part I formal examinations

The Part I examination is taken after at least 18 months of training in diagnostic and clinical microbiology.

The Part I examination has an emphasis on the theoretical, practical and interpretative aspects of investigations in all fields of clinical microbiology. It is taken after at least 18 months of training in diagnostic and clinical microbiology. There are no automatic exemptions given to any trainee for any component of the examinations. The Part 1 examination must be taken during a year of laboratory training.

The Part I examination has two phases and addresses issues including but not limited to:

- epidemiology, pathogenesis and prevention of infectious diseases;
- sterilisation and disinfection, media production, QC and laboratory safety;
- basic microbial structure and metabolism and genetics;
- host-pathogen relationships;
- specimen collection, processing, identification and further testing (e.g. antimicrobial susceptibility) of the full range of likely samples and pathogens to be experienced at the tertiary care level hospital, including bacteriology, mycology, virology and parasitology;
- contemporary issues in microbiology, including for example, emerging pathogens, bioterrorism;
- molecular biology techniques relevant to diagnostic microbiology, microbiology research and molecular epidemiology.

Phase 1:

- Written paper A ,duration 3 hours 15 minutes, with 20 questions requiring extended answers;
- Written paper B, duration 3 hours 15 minutes, with up to 50 short answer questions with images to be identified, data to be interpreted, problems to be solved.
- A 'wet' practical examination, testing practical ability to identify up to 10 unknown organisms such as those in the RCPA QAP. Antibiotic susceptibility testing and microscopy may be required. This is held in the Trainee's own laboratory.

Phase 2 (only offered to those who pass all Phase 1 components)

- An oral examination, in which candidates rotate through up to eight (8) structured interview stations. Reading time is allowed prior to the examination.

Results

Candidates must pass both phases of the examination for a pass result. At the discretion of the Chief Examiner components of the Phase 1 that are passed may be carried over for 1 year only.

Each phase of the examination stands alone. At the discretion of the Chief Examiner, candidates who pass Phase I but are unsuccessful in Phase 2 may be given an exemption from the Phase 1. Exemptions granted are valid for one year.

Portfolio

The portfolio is a record of activities associated with the trainee's daily work. Trainees are advised to commence these activities at the earliest possible time after commencing training. The hard copy portfolio must be made available to the supervisor to check periodically. A print-out of the portfolio summary spreadsheet must be included as the front page of the portfolio.

The hard copy portfolio and summary spread sheet will be checked for completeness by the supervisor before the Part I examination.

Please refer to the portfolio requirements which are set out in Appendix 5.

Detailed instructions are included on the forms that must be used to record the activities. The forms are in **Appendix 6**. The portfolio summary spread sheet (Excel file) may be downloaded from the RCPA website.

The portfolio and summary spreadsheet must be provided to the supervisor to review when they are preparing the supervisor report.

A print copy of the portfolio summary spreadsheet should be appended to the annual report (in a laboratory year for Joint Trainees) and to supervisor report which is sent to the RCPA prior to the Part I oral examination. The summary spreadsheet will be reviewed by the Chief Examiner and the Registrar of the Board of Education and Assessment. The signatories and trainee may be contacted to confirm evidence of satisfactory completion.

NOTE: The portfolio itself should not be sent to the College unless requested for audit.

Supervisor Reports

Trainees must submit a [supervisor report](#) for each year of laboratory training, including periods of rotation. There are different forms for single discipline and joint trainees. Trainees who are sitting the Part I examination must submit an additional pre-examination supervisor report and a print-out of the portfolio summary spreadsheet in the year of the examination.

Please refer to *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) for the due dates for these reports.

It is the trainee's responsibility to ensure that the pre-examination supervisor report is completed and submitted by the due date. Failure to do so may jeopardise the accreditation of training time or finalisation of examination results. The can be downloaded from the website:

Submission of supervisor reports: Single discipline and joint trainees should ensure that they use the appropriate form and follow the advice in **Appendix 4**.

Summary of assessment requirements for Part I

Item	Completion	Assessed by	Comments
Written exam A	Before oral exam	Chief Examiner. Questions are double marked by microbiology examiners.	Questions set by the examinations subcommittee of the Microbiology Advisory Committee See Appendix 2
Written exam B			
Wet practical exam	Before oral exam	Marked by QAP representative. Results reviewed by Chief Examiner.	Samples prepared by QAP Held in own laboratory
Structured oral examination: up to 8 structured interviews	After passing written and wet practical exams.	Appropriately trained examiners with at least 5 years post-Fellowship experience	Set by panel of independent examiners and sub-committee of Microbiology Advisory Committee
Portfolio items to be signed off by supervisor or delegate (see Appendix 5 for items to complete)	Before the oral MB1 exam.	The Portfolio summary spreadsheet is checked for completeness by BEA Registrar or Deputy Registrar. If incomplete, the candidate may be required to undertake further activities.	Portfolio items are to be reviewed by the supervisor when preparing the supervisor report The portfolio itself should not be sent to the College unless requested for audit
Supervisor reports: end-of-rotation, annual and pre-exam reports, with print copy of portfolio summary spreadsheet appended to the annual and pre-exam reports. Note for Joint Trainees, send the pre-exam spreadsheet directly to RCPA.	See RCPA or RACP website for submission dates	Reviewed by the Registrar and chief examiner or delegate. Joint trainees reports are also reviewed by CJCT Coordinator of Advanced Training	Referral to Chief Examiner if necessary See Appendix 4

Assessment calendar

Please refer to the [RCPA Training Handbook – Administrative Requirements](#) on the RCPA website for key assessment dates.

Appendix 3

Part II assessment

All trainees must have passed all components of the Part I assessment to be eligible to enrol in the Part II assessment. RCPA trainees are ordinarily eligible to sit the Part II examination in the final year of training. Joint RCPA/RACP trainees must sit this examination no earlier than their final (third) year of laboratory microbiology training. As with the Part 1 examination, the Part 2 examination can only be attempted during a year of laboratory training.

This more advanced training encourages diversity, specialisation and investigation within fields of microbiology and trainees will have sufficient choice to be assessed in an area of sub-specialisation (e.g. virology). However, knowledge of the wide field of microbiology and in particular, recent issues in microbiology is still expected.

Assessment in Part II is by:

- Formal structured oral examination;
- A major project
- A minor project
- Portfolio: successful completion of the required number and type of activities
- Satisfactory supervisor reports

The same requirements apply to RCPA-only trainees, Joint RCPA/RACP trainees and research stream trainees, **except** that research stream candidates complete a PhD or MD thesis instead of the major project. All components must be completed satisfactorily for a pass result.

See Assessment matrix in **Appendix 9**.

Examinations are prepared in accordance with [RCPA Guideline 3/2015 Quality Framework for RCPA Examinations – Written, Practical and Oral](#).

Oral examination

Candidates rotate through a multi-station set of structured interviews (up to 8 stations). There is reading time before and between stations. The topics examined may include quality assurance, safety, management, medico-legal issues, communication and teamwork and well as technical aspects of microbiology. The issues are those which it is likely that a recently qualified Fellow would have to deal with.

A repeat examination later in the same year may be offered to unsuccessful candidates, as per the RCPA Policy on Repeat Examinations 7/2001.

Major project

The major project report is due in the year the trainee sits the Part II examination. Please refer to the *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) for the due date.

It should demonstrate the trainee's ability to plan, perform and present the results of a scientific investigation in medical microbiology. As evidence of this trainees must submit one of the following:

- A paper of which the trainee is senior or sole author, published in a refereed medical journal;
- A completed and accepted thesis for a higher degree;
- The manuscript of a research project written in a style suitable for publication.

It should be a significant piece of laboratory based research work related to the pathogenesis, antimicrobial therapy or diagnosis of infectious diseases.

Reports, including theses from candidates undertaking the research stream, must be submitted in triplicate for perusal by the Chief Examiner and two other examiners. If, in the opinion of the examiners, the project work is inadequate, the trainee will be asked to revise and resubmit the work.

A solely clinical project is not appropriate for satisfying this component of the joint training program. Project planning may begin at any stage of training. The project must be completed after the Part I examination and submitted on the due date, prior to the Part II oral examination.

Please refer to **Appendix 7** for further guidelines.

Minor project

The minor project is a written report demonstrating the trainee's understanding of laboratory practice. The report should be 1000 – 3000 words long, plus references. It must be the work of the candidate alone and must not have been submitted for assessment previously, eg, to satisfy the infectious disease project requirements of joint training program candidates.

Suitable projects may include, but are not restricted to:

- Case based report focusing on the laboratory issues of diagnosis and testing;
- Literature review of a relevant topic;
- Audit of a specific test, with recommendations for change if appropriate, including cost, turnaround times, sensitivity, specificity and measurement of uncertainty

The project can be completed at any time after the Part 1 examination. Please refer to the *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) for the due date. The project will be graded by a member of the microbiology examiners panel as either satisfactory or not satisfactory. Candidates whose projects are not satisfactory will be asked to revise and resubmit the work.

Please refer to **Appendix 8** for further guidelines.

Portfolio

The portfolio is a record of activities associated with the trainee's daily work. Trainees are advised to commence these activities at the earliest possible time after commencing training. The hard copy portfolio must be made available to the supervisor to check periodically. A print-out of the portfolio summary spreadsheet must be included as the front page of the portfolio.

The hard copy portfolio and summary spread sheet will be checked for completeness by the supervisor before the Part II examination. It is strongly recommended that trainees commence these activities at the earliest possible time after commencing training.

Please refer to the portfolio requirements which are set out in Appendix 5.

Detailed instructions are included on the forms that must be used to record the activities. The forms are in **Appendix 6**. The portfolio spread sheet (Excel file) may be downloaded from the RCPA website.

The portfolio and summary spreadsheet must be provided to the supervisor to review when they are preparing the supervisor report.

A print copy of the summary spreadsheet should be appended to the annual report (only in a laboratory year for Joint Trainees) and to the supervisor report which is sent to the RCPA prior to the Part II oral examination. The summary spreadsheet will be reviewed by the Chief Examiner and the Registrar of the Board of Education and Assessment. The signatories and trainee may be contacted to confirm evidence of satisfactory completion.

NOTE: The portfolio itself should not be sent to the College unless requested for audit.

Supervisor Reports

Trainees must submit a [supervisor report](#) for each year of laboratory training, including periods of rotation. There are different forms for single discipline and joint trainees. Trainees who are sitting the Part II examination must submit an additional pre-examination supervisor report and a print-out of the portfolio summary spreadsheet in the year of the examination.

Please refer to *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) for the due dates for these reports.

It is the trainee's responsibility to ensure that the pre-examination supervisor report is completed and submitted by the due date. Failure to do so may jeopardise the accreditation of training time or finalisation of examination results. The can be downloaded from the website:

Submission of supervisor reports: Single discipline and joint trainees should ensure that they use the appropriate form and follow the advice in **Appendix 4**.

Summary of assessment requirements for Part II for RCPA single discipline and Joint trainees

A pass or exemption in the BPS examination is required before enrolling for the Part II examination.

Item	Completion	Assessed by	Comments
Major project	In the year of sitting the MB II oral exam	Chief examiner and two additional examiners	Trainee and supervisor declarations to be completed. 3 copies to be submitted.
Minor project	Before the MB II oral exam	Member of Microbiology Examiners Panel	Trainee and supervisor declarations to be completed. 3 copies to be submitted
Oral examination: multi-station set of structured interviews	After submission of projects and Portfolio	Appropriately trained examiners with at least 5 years post-Fellowship experience	Questions set by panel of independent examiners and compiled by sub-committee of the Microbiology Advisory Committee
Portfolio items to be signed off by supervisor or delegate (see Appendix 5 for items to complete)	Before the oral MB II exam	The Portfolio summary spreadsheet is checked for completeness by BEA Registrar or Deputy Registrar. If incomplete, the candidate may be required to undertake further activities.	Portfolio items are to be reviewed by the supervisor when preparing the supervisor report The portfolio itself should not be sent to the College unless requested for audit
Supervisor reports: end-of-rotation, annual and pre-exam reports, with print copy of portfolio summary spreadsheet appended to the annual and pre-exam reports.	See RCPA or RACP website for submission dates	Reviewed by the BEA Registrar and Chief Examiner or delegate. Joint trainees: also reviewed by CJCT Coordinator of Advanced Training	Referral to Chief Examiner if necessary See Appendix 4

Assessment requirements for Research Stream candidates

Research stream candidates must

- satisfy the DOPS, CbD and supervisor report requirements specified in the Table above;
- provide evidence that they have participated in a sufficient number and type of activities specified in the portfolio;
- submit formal confirmation that the PhD thesis or MD thesis has been accepted;
- achieve a pass in the structured oral examination;

Assessment calendar

Please refer to the [RCPA Trainee Handbook – Administrative Requirements](#) (on the RCPA website) for key assessment dates

Appendix 4

Guidelines for completing the Supervisor Report Form

Please refer to the following documents:

- [Information about the role and responsibilities of supervisors and resources to support supervision](#)
- [The RCPA policy on the Supervision of Training and Accreditation of Supervisors](#)

The [supervisor report](#) form should be completed by the supervisor in consultation with other laboratory staff who have a significant role in the trainee's training program and with reference to the trainee's portfolio.

Please refer to the portfolio requirements which are set out in Appendix 5.

Trainees must make their up-to-date portfolio available to the supervisor for the annual rotation and pre-examination reviews. For the pre-examination review, a print-out of the portfolio summary spread sheet must also be made available.

Supervisors should be mindful that scoring trainee performance is of critical importance in early notification of underperforming trainees so that remedial action can be initiated early in training, if appropriate. Experience tells us that most trainees score 3, which indicates that they are performing at the expected level of training. A score of 1 or 2 identifies to the College an underperforming trainee and flags the need for evaluation for trainee support pathways.

Trainees are responsible for the safe keeping of all these records and should **not** contact the College for the previous year's supervisor report.

Submitting the Supervisor Report

It is the trainee's responsibility to ensure that the form is completed and submitted by the due date. At least one supervisor report is due annually and may be submitted with the annual registration for the subsequent year. For trainees who participate in rotational programs, one report is required to be submitted on completion of each period of rotation at a different institution.

For trainees sitting for Part I and Part II examinations, the additional pre-examination supervisor report with a print copy of the portfolio summary spreadsheet is to be submitted to the RCPA by the date specified in the *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website).

Joint Trainees should use the Joint RCPA-RACP Joint Trainee Supervisor Report form and follow the submission guidelines on the final page. The RCPA will accept the mid-year supervisor report as the pre-examination report. A print-out of the RCPA portfolio summary sheet must be appended.

Single Discipline Trainees should post the RCPA supervisor report form by the due date to:
The Royal College of Pathologists of Australasia
207 Albion Street
Surry Hills NSW 2010 AUSTRALIA

Faxed reports will not be accepted.

Appendix 5

Portfolio Requirements

The table below contains guidelines to assist trainees to compile the portfolio and the portfolio summary spreadsheet.

Portfolio activities are carried out in the workplace and provide evidence that the trainee is developing technical skills and professional values, attitudes and behaviours that are not readily assessed by formal examinations.

Trainees should start accumulating evidence for the portfolio as early as possible in training and aim to have half of them underway or complete before the Part I examination.

Appendix 6 contains the forms and detailed instructions for recording these workplace activities. Please file the (hard copy) forms in a **portfolio folder** with separate sections for each category of activity.

A soft copy **portfolio summary** (Excel spreadsheet) should also be compiled so that trainees can keep track of what they have completed. The spreadsheet can be downloaded from the RCPA website. It is the trainee's responsibility to keep both hard and soft copy records **up-to-date**.

The supervisor should review and sign off completed portfolio items on the annual, rotation and pre-exam supervisor report.

The portfolio summary spreadsheet should be printed and appended to the pre-exam supervisor report and submitted to the RCPA prior to the oral examination at a time determined by the RCPA. The summary will be reviewed by the Registrar, Board of Education and Assessment and the Chief Examiner. The signatories and trainees may be contacted to confirm evidence of satisfactory completion.

Note: The actual portfolio should not be sent unless requested for audit.

Cat	Item	Part I	Part II	Evidence
1	Laboratory safety checklist.	Checklist to be completed within 3 months of starting training. eLearning module to be completed during training		Checklist – one required Certificate of completion of eLearning module (see point 12 below)
1	DOPS 12 to be completed satisfactorily during training	8 general benches before Part I Special benches can be done but not required until Part II	4 special benches	DOPS form All forms to be signed by supervisor or other appropriately qualified person. See Appendix 6
1	CbD	2 per year and 5 before Part I. These must come from five (5) different sites of infection	2 per year. 4 from high complexity cases before Part II	CbD form All forms to be signed as satisfactory by supervisor or other appropriately qualified person. See Appendix 6
1	Incident reports Reflections on significant incidents during the year	2 per year throughout training.		Significant incident report form See Appendix 6

Cat	Item	Part I	Part II	Evidence
1	Supervisor report/s for each year and/or rotation. Must have a brief reflection (max 1 page) on the supervisor's comments for each report.	End-of-rotation and annual reports. An additional pre-exam report is required in the year of the Part I and II assessments See RCPA website for submission dates.		Supervisor Guidelines See Appendix 4
2	Clinical meetings Chosen from the list on the form in Appendix 6.	3 per year throughout training,		Clinical Meetings Report Form See Appendix 6
3	Research and scholarly activities Chosen from the list on the form in Appendix 6.	Minimum 2 per year. 7 required before Part I.	Minimum 3 per year 8 required before Part II	Research and scholarly activities form Note some activities have maximum and minimum restrictions. See Appendix 6
4	Quality activities Chosen from the list on the form in Appendix 6. Note mandatory activity	2 per year throughout training		Quality activities form Certificate of completion of activity 4.6 See Appendix 6
5	Management, safety, ethics, cultural competence Chosen from the list on the form in Appendix 6. Note some mandatory activities	1 per year throughout training		Management, ethics, safety, cultural competence form. Certificate or email verifying completion of activities 5.3, 5.4, 5.5 See Appendix 6
6	Infection control and public health Chosen from the list on the form in Appendix 6.	2 per year throughout training		Infection control and public health form See Appendix 6
7	Antimicrobial stewardship Chosen from the list on the form in Appendix 6.	1 per year throughout training		Antimicrobial stewardship form See Appendix 6

Summary of requirements

	Cat 1				Cat 2	Cat 3	Cat 4	Cat 5	Cat 6	Cat 7
	DOPS	CbD	Incident reports	Lab safety	Meetings	Research scholarship	Quality activities	Mgmt, Ethics, Safety	Infection control & pub health	Antibiotic stewardship
Part I	8	5	2/yr	1	3/yr	7	2/yr	1/yr	2/yr	1/yr
Part II	4	4	2/yr	0	3/yr	8	2/yr	1/yr	2/yr	1/yr
Total for joint trainees (3 yrs MB)	12	9	6	1	9	15	6	3	6	3
Total for single trainees (5 yrs MB)	12	10	10	1	15	15	10	5	10	5


Appendix 6

Forms and logbook pages

Appendix 6 contains master copies of forms to be used to record activities for the portfolio. Please make as many copies as you need and file the completed forms in the portfolio folder.

The forms are

- Laboratory safety checklist
- DOPS form
- CbD form
- Significant incident report form
- Clinical meetings sign off form (portfolio category 2)
- Research and scholarly activities sign off form (portfolio category 3)
- Quality activities sign off form (portfolio category 4)
- Management, safety, ethics and cultural competence sign off form (portfolio category 5)
- Infection control and public health sign off form (portfolio category 6)
- Antimicrobial stewardship sign off form (portfolio category 7)
- Major project proposal, project guidelines and cover page
- Minor project guidelines and cover page

	<h2 style="margin: 0;">Laboratory Safety Checklist</h2>
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This form is designed to confirm that trainees have understood and are able to apply laboratory safety instruction provided by the employer as it relates to the RCPA curriculum. It covers the essentials for new trainees and is the basis for subsequent learning that will be assessed and eventually lead to the ability to function in a laboratory management role as a pathologist.

- I have participated in a laboratory safety induction program or educational session
- I have reviewed the laboratory safety manual
- I know where to find the laboratory safety equipment and how to use it
- I have known immunity to hepatitis B (natural or vaccine)
- I have been vaccinated and/or screened for other infectious diseases as required by my laboratory
- I know how and when to wash my hands and carry this out
- I wear enclosed shoes in the laboratory and tie back long hair if applicable
- I wear appropriate protective clothing (gown, gloves, goggles, mask as needed) and always remove it before leaving the laboratory
- I cover any cuts or wounds before working in the laboratory
- I never eat or put anything in my mouth whilst in the laboratory
- I know how to handle blood and other body substances and tissues to avoid transmission of infection to myself and others
- I know how to prevent sharps injury
- I am aware of electrical, chemical, radiation and biological hazards and how to prevent them
- I know what to do in an emergency
- I know the procedure for reporting safety-related incidents
- I know where to find information about legislative requirements for laboratory safety
- I know where to find detailed information about laboratory hazards such as dangerous chemicals
- I always clean up after myself
- I set up my workspace and ensure correct posture and lifting technique so as to avoid strain and injury

Trainee name (print) Signature.....

Witness (supervisor or other senior member of staff):

Name (print) Signature.....

Date:

Directly Observed Practical Skills

The purpose of the Direct Observation of Practical Skills (DOPS) assessment is to indicate trainees' acquisition of practical laboratory skills; to show that they can work safely in the laboratory; and to provide feedback on progress by highlighting strengths and areas for improvement, thereby encouraging their professional development.

A minimum of four (4) DOPS per year are required; eight (8) general bench DOPS are required before Part I. The four (4) specialist bench DOPS can be done prior to Part I but must be completed by the Part II exams.

It is important to observe the trainee doing the activity. Observations can be made by the supervisor and also by suitably qualified scientific staff. Assessors who are RCPA Fellows can note this as a quality activity in their annual CPDP submission.

Trainees should initiate the DOPS assessment by requesting an appropriate assessor to observe them when they are confident they can complete it satisfactorily. The time taken will vary according to the skill. QAP specimens may be used for DOPS.

When observing competence in a multi-part skill, the assessor should tick the bench in Section A of the form and as many of the Section B boxes as have been observed. Observations might take place intermittently over the course of 2-3 days. Assessors should observe all Section B steps at least once but it is not necessary to observe the same step repeatedly.

Over time the assessments should cover each general and special bench and all the skills of microscopy, staining, culture, reading, microbial identification, susceptibility testing, molecular techniques and antigen testing. If a laboratory is unable to provide all 8 specified general benches, one (1) unspecified bench may be substituted.

The assessor should complete the DOPS form while the trainee is present and spend 5-10 minutes providing immediate feedback.

Grading, standards and outcome of assessment

Each aspect of the trainee's performance should be graded. The "n/a" option should be used if the assessor has not observed that aspect or is otherwise unable to comment.

The trainee's strengths as well as areas for improvement should be discussed with the trainee. Feedback should be given sensitively, in a suitable environment. Areas for development should be identified, agreed and recorded on the DOPS form.

The final outcome should be graded according to whether the standard of performance is as expected for the stage of training. The level of competence should be such that the trainee would be able to perform the task safely without supervision, usually at the level of a competent junior scientist. A trainee whose performance does not meet the standard will be able to repeat the assessment with no penalty.

Record keeping

The DOPS forms must be fully completed, signed and dated by the trainee and the assessor. The forms must be retained by the trainee in his/her portfolio. Only DOPS for which the trainee has met the standard need to be kept in the portfolio

		Microbiology DOPS Assessment Form Directly Observed Practical Skills			
Trainee name		Trainee ID (RCPA)	Stage of training Y1 Y2 Y3 Y4 Y5 if >Y5, please specify		
Assessor name		Assessor position <input type="checkbox"/> Pathologist <input type="checkbox"/> Scientist <input type="checkbox"/> Snr Trainee <input type="checkbox"/> Other (pls specify)			
USE ONE FORM PER BENCH. <i>For Section A and tick as many from Section B as apply. For Section C, tick the bench being observed.</i>					
Section A: General Benches (tick box that applies) <input type="checkbox"/> Specimen reception and accessioning <input type="checkbox"/> Urine bench <input type="checkbox"/> Faeces examination for parasites <input type="checkbox"/> General bacteriology, eg, respiratory, faeces, genital, pus <input type="checkbox"/> Microscopy of fluids, eg, joint fluids, CSF <input type="checkbox"/> Blood culture bench <input type="checkbox"/> Mycology bench <input type="checkbox"/> Organism not identifiable on MALDI-TOF <input type="checkbox"/> Other (please specify)		Section B (tick as many as apply) <input type="checkbox"/> Microscopy/staining <input type="checkbox"/> Culture set up (eg media, atmosphere, etc) <input type="checkbox"/> Culture reading <input type="checkbox"/> Microbial identification <input type="checkbox"/> Susceptibility testing <input type="checkbox"/> Other (please specify)			
Section C - Special processes (tick box that applies) <input type="checkbox"/> Quality control <input type="checkbox"/> Molecular <input type="checkbox"/> Serology <input type="checkbox"/> Other (please specify)					
Brief description of procedure to be observed and assessed					
Please comment on whether these aspects of the trainee's performance are as expected for the stage of training			Yes	No	n/a
Specimen handling, preparation, laboratory information system requirements					
Select appropriate media/equipment; use according to standard operating procedures					
Interpret and discuss findings, with reference to specimen, test and patient type					
Investigation of possible laboratory error					
Perform and record quality control information relevant to the bench					
Safe handling and observes appropriate occupational health and safety requirements					
Final written report					
Timely, efficient, cooperative performance					
Please comment on other relevant aspects, especially on aspects for improvement					
Final outcome (circle one) As expected for the stage of training Below expected for the stage of training		Date of DOPS	Time taken for DOPS	Time taken for feedback	
Name (print) and signature of assessor			Signature of trainee		
Name of laboratory					

CbD (Case-based Discussion) Assessment Form

Throughout training, trainees should seek opportunities to present and discuss cases with experienced colleagues and receive feedback. The CbD form should be used to formally record at least 2 of these sessions per year. At least five (5) low-to-medium complexity CbD forms should be signed off as satisfactory before the Part I examination. These should be for routine situations and those with frequently occurring, manageable complications. A minimum of four (4) high complexity cases should be signed off as satisfactory between the Part I and Part II examinations. These should be for difficult or unusual situations in which the level of complexity may relate to the organism itself, and specialised technical procedures required to identify it; to clinical complexity where there is a wide differential diagnosis and hence a range of investigation needed; or complexity in terms of implications e.g. public health significance.

CbD assessments in microbiology indicate the trainee's ability to interpret and relate pathological results to clinical findings, to plan appropriate investigations and make decisions regarding patient care, including decisions with ethical and legal dimensions. The purpose of the CbD assessment is also to provide feedback about trainees' progress by highlighting strengths and areas for improvement.

The trainee should initiate each CbD assessment by selecting two recent cases of patient infections in which s/he has been involved clinically or through laboratory tests. The assessor should select one of these for the trainee to present and discuss. The assessor, should be an RCPA Fellow but not necessarily the listed supervisor. The trainee should request a mutually convenient time for a 30 minute discussion, which allows 15-20 minutes for the presentation/discussion and 5-10 minutes for the assessor to give immediate feedback and complete the CbD form.

Each CbD topic should exemplify a **different** site of infection (see CbD form) and can focus on one or more of the following aspects:

- medical record keeping;
- clinical/microbiological assessment;
- clinical management, ie, selection of investigation(s), interpreting and reporting results, advice regarding antimicrobial therapy, prophylaxis or immunisation;
- infection control and health protection/public health;
- quality improvement;
- professionalism, eg ethical/legal aspects, teamwork


Grading, standards and outcome of assessment


Each aspect of the trainee's performance should be graded. The "n/a" option should be used if the assessor has not observed that aspect or is otherwise unable to comment. Feedback should be given sensitively in a suitable environment and should include strengths and areas for development which should be identified agreed and recorded on the CbD form.

The final outcome should be graded according to whether the standard of performance is as expected for the stage of training. A trainee whose performance does not meet the standard will be able to repeat the assessment with no penalty.

Record keeping

The CbD forms must be fully completed, signed and dated by the trainee and the assessor. The forms must be retained by the trainee

		Microbiology Case-based Discussion (CbD) Assessment Form	
Trainee name		Trainee ID (RCPA)	Stage of training Yr1 Yr2 Yr3 Yr4 Yr5 if more than Yr5, please specify
Assessor name		Assessor position <input type="checkbox"/> Pathologist <input type="checkbox"/> Senior registrar <input type="checkbox"/> other(specify)	
Site of infection (tick box) <input type="checkbox"/> blood stream <input type="checkbox"/> cardiovascular <input type="checkbox"/> respiratory <input type="checkbox"/> bone/joint <input type="checkbox"/> wound/soft tissue <input type="checkbox"/> gastrointestinal <input type="checkbox"/> central nervous system <input type="checkbox"/> intra-abdominal <input type="checkbox"/> urinary tract <input type="checkbox"/> burns/plastics <input type="checkbox"/> sexually transmitted infections <input type="checkbox"/> other (please specify)		Technique <input type="checkbox"/> microscopy <input type="checkbox"/> culture <input type="checkbox"/> serologic diagnosis <input type="checkbox"/> molecular <input type="checkbox"/> other (please specify)	
Complexity of case (tick box)		<input type="checkbox"/> low	<input type="checkbox"/> medium <input type="checkbox"/> high
Brief description of case presented, discussed and assessed			
Please comment on whether these aspects of the trainee's performance are as expected for the stage of training		Yes	No n/a
Initial assessment of clinical, pathological, microbiological aspects of case			
Appropriate initial and follow up investigation/s selected			
Interpretation of findings			
Clinical management advice (eg, regarding therapy, prophylaxis, immunisation)			
Infection control/public health advice			
Overall laboratory and clinical judgment			
Reporting of findings			
Ability to present and discuss case			
Please comment on other relevant aspects, especially on aspects for improvement			
Final outcome (please circle) As expected for the stage of training Below expected for the stage of training	Date of CbD	Time taken for CbD	Time taken for feedback
Name (please print) and signature of assessor		Signature of trainee	
Name of laboratory			

		Microbiology Significant incident report form				
Trainee name		Trainee ID (RCPA)		Stage of training Year1 Yr2 Yr3 Yr4 Yr5 if more than Yr5, please specify		
Nature of incident: what happened and why was it significant?						
What led to the incident?						
Action taken at the time of the incident. Could it have been handled differently?						
Review of similar incidents						
Actions taken (or needed) to prevent future similar incidents						
Reflection by trainee						
Supervisor name (please print) and signature					Date	



**Microbiology
Sign off form for Portfolio Category 2
Clinical Meetings**

How to use this form

This form is to be used to record that the trainee has attended at least **3 different clinical activities per year** from the following list

- Code 2.1** Multi-disciplinary clinical meetings, grand rounds, ward rounds, CPC clinic-pathological correlation meetings, morbidity and mortality meetings, etc. Signature required from supervisor or meeting chair.
- Code 2.2** Conferences, courses, seminars, workshops, forums. Please attach receipt or other evidence of attendance.
- Code 2.3** Journal club, small group learning session
- Code 2.4** Other (please specify)

Note: meetings concerned with management, QA, ethics, infection control, etc, are not to be recorded on this form.

For each activity, trainees must write a one page (maximum) reflection on what they gained from the activity.

At the end of each year, this form, appended reflections and any other appended documentation should be sighted by the supervisor and signed off on the annual supervisor report.

Trainee name	Trainee ID	Stage of training Y1 Y2 Y3 Y4 Y5 if > Y5 please specify
---------------------	-------------------	--

	Meeting date	Code	Brief description of clinical meeting (include meeting name, location, where relevant)	Signature of supervisor or meeting chair
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				



Microbiology
Sign off form for Portfolio Category 3
Research and scholarly activities

How to use this form

This form is to be used to record that the trainee has engaged in at least **2 different activities per year before Part I and 3 different activities per year before Part II** from the following list:

- Code 3.1** Literature review and preparation of materials (eg slides) to support teaching or conference presentation. Record the topic and list the references reviewed. **Minimum 1, maximum 3 before Part 1 and between Parts I and II.**
- Code 3.2** Teaching sessions (lecture, seminar) for medical students, lab staff, GPs, etc. Attach a reflection on what you gained from the activity (max 1 page). **Minimum 2 maximum 4 before Part I. Minimum 1 between Parts I and II.**
- Code 3.3** Oral or poster presentation at scientific meeting. Attach a reflection on what you gained from the activity (max 1 page). **Minimum 1, maximum 3 before Part I and between Parts I and II.**
- Code 3.4** Publications, journal articles, book chapter, monograph, published or written to a standard suitable for publication. Cite the reference for published works. Attach the manuscript for unpublished works
- Code 3.5** Develop assessments or educational modules for RCPA. Attach a copy or synopsis of material developed. Limit of 2 during training.
- Code 3.6** Review or develop educational materials for non-pathologists, eg, Lab Tests Online. Attach a copy or synopsis of material.
- Code 3.7** Self-assessment activities. Attach a reflection on what you gained from the activity (max 1 page).
- Code 3.8** Formal self-education study, eg, on-line educational modules (eg College of American Pathologists (CAP) modules), journal review of cases you have worked up. Attach a reflection on what you gained from the activity (max 1 page).
- Code 3.9** Academic award courses. Attach a copy of transcript of results.
- Code 3.10** Other (please specify)

For each activity, trainees must write a one page (maximum) reflection on what they gained from the activity. At the end of each year, this form, appended reflections and any other appended documentation should be sighted by the supervisor and signed off on the annual supervisor report.

Trainee name		Trainee ID		Stage of training Y1 Y2 Y3 Y4 Y5 if > Y5 please specify		
	Date	Code	Brief description of activity (include meeting name, URL, etc where relevant)	Supervisor signature		
1						
2						
3						
4						
5						
6						
7						
8						



**Microbiology
Sign off form for Portfolio Category 4
Quality activities**

How to use this form

This form is to be used to record that the trainee has attended at least **2 different activities per year** from the following list.

- Code 4.1** Participate in external and internal quality management, processing external QA samples, review of documents/manuals, etc. Examples of suitable activities are on the following page.
- Code 4.2** Attend NATA training courses or RCPA management course. Attach registration or other evidence of attendance.
- Code 4.3** Clinical or case audit, including review of methods. Examples of suitable activities are on the following page.
- Code 3.4** Participate in and contribution to meetings concerned with introducing new tests or instruments, altered work flow, etc. Examples of suitable activities are on the following page.
- Code 4.5** Participate in RCPA committees (eg TAC); participate in a planning group for an RCPA-sponsored workshop or course; represent RCPA on other committees, eg regulatory or institutional bodies. Attach a letter from RCPA confirming representation.
- Code 4.6** **MANDATORY REQUIREMENT.** Complete the [Quality Management eLearning Module](#) in RCPA Education Online and attach the certificate of competence.
- Code 4.7** Other (please specify)

For each activity, trainees must write a one page (maximum) reflection on what they gained from the activity.

At the end of each year, this form, appended reflections and any other appended documentation should be sighted by the supervisor and signed off on the annual supervisor report.

Trainee name			Trainee ID	Stage of training				
				Y1	Y2	Y3	Y4	Y5
				if > Y5 please specify				
Date	Code	Brief description of activity (include committee, meeting, location, where relevant)					Supervisor signature	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Examples of quality activities

When devising quality activities, trainees should use the following examples as a guide to the type of activity and the amount of effort that is expected.

4.1 External and internal quality management

External quality management: Review a survey report from QAP. Note any errors or discrepancies, and write or present a brief discussion about possible sources of error and possible corrective/preventive actions.

Internal quality management: Read the [ASM document on quality control](#) and carry out one of the test procedures described in it.

4.3 Clinical or case audit, including reviews of methods

Read about [pre-analytical errors](#) and carry out an audit of a selected series of samples in the laboratory, for example document all instances of specimen rejection over a period of time, noting reasons for rejection, appropriateness of actions taken and/or suggestions for preventive strategies.

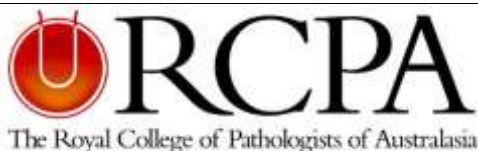
Review requests for a particular type of test, eg hepatitis serology, correlating clinical information with test procedures carried out in the laboratory. If any deficiencies noted, what could be done to correct them?

Carry out an audit relating to post-analytical factors, eg, assess whether there are appropriate mechanisms to ensure that wound culture reports to surgical units are reviewed by a doctor caring for the patient.

Carry out an audit relating to post-analytical factors, eg, correlate a series of antibiotic sensitivity reports with patient charts to determine whether antibiotic therapy was appropriate or if suitable modifications were made based on the reports.

4.4 Introduce new tests/instruments, altered work flows, etc

Write a brief discussion about how introduction of MALDI-TOF technology will impact on specimen turnaround times and/or the impact on work flow for scientists and/or the impact on how and when pathologists sign out reports.



**Microbiology
Sign off form for Portfolio Category 5
Management, Safety, Ethics, Cultural
Competence**

How to use this form

This form is to be used to record that the trainee has performed at least **1 activity per year** from the following list:

- Code 5.1** Attend departmental management committees, budget meetings, other management-related meetings, ethics review committees.
- Code 5.2** Undertake significant management roles, eg, chairperson, secretary, treasurer of microbiology-related committees.
- Code 5.3 MANDATORY ACTIVITY.** Complete the 6 [Ethics eLearning modules](#) in RCPA Education Online and attach evidence of completion.
- Code 5.4 MANDATORY ACTIVITY** Complete the [Laboratory Safety eLearning module](#) in RCPA Education Online and attach the certificate of competence.
- Code 5.5 MANDATORY ACTIVITY.** Complete the Cultural Competence eLearning module in RCPA Education Online. Attach the certificate of competence. OR provide evidence of having completed cultural competence training provided by your employer, if a registered health services provider.
- Code 5.6** Other (please specify)

For each activity, trainees must write a one page (maximum) reflection on what they gained from the activity.

At the end of each year, this form, appended reflections and any other appended documentation should be sighted by the supervisor and signed off on the annual supervisor report.

Trainee name			Trainee ID	Stage of training Y1 Y2 Y3 Y4 Y5 if > Y5 please specify				
Date	Code	Brief description of activity (including committee name, location, where relevant)			Supervisor signature			
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								



Microbiology
Sign off form for Portfolio Category 6
Infection control, public health

How to use this form

This form is to be used to record that the trainee has performed at least **2 different activities per year** from the following list:

- Code 6.1** Participate in WHS committees, infection control/public health committees. Statement from committee chair regarding trainee’s role in the committee.
- Code 6.2** Participate in infection control rounds, investigation of outbreaks or case reviews/audits of hospital acquired infection.
- Code 6.3** Visit public health laboratory to learn about procedures for outbreak investigation.
- Code 6.4** Retrieve statistical information on notifiable diseases and resistant organisms from the lab database, using CLSI or other guidelines, including rationale for selection/reporting.
- Code 6.5** Discuss procedures for notification of infectious diseases with supervisor or clinician.
- Code 6.6** Other (please specify)

For each activity, trainees must write a one page (maximum) reflection on what they gained from the activity.

At the end of each year, this form, appended reflections and any other appended documentation should be sighted by the supervisor and signed off on the annual supervisor report.

Trainee name			Trainee ID	Stage of training				
				Y1	Y2	Y3	Y4	Y5
				if > Y5 please specify				
	Date	Code	Brief description of activity (including committee name, location, where relevant)					Supervisor signature
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								



**Microbiology
Sign off form for Portfolio Category 7
Antimicrobial stewardship**

How to use this form

This form is to be used to record that the trainee has engaged in at least **1 different activity per year** from the following list:

- Code 7.1** Participate in drug committee meetings. Statement from committee chair regarding trainees role in the committee.
- Code 7.2** Audit antibiotic use in collaboration with a pharmacist.
- Code 7.3** Read papers on drug resistance (while we encourage you to read as many as you like, one only can be counted for the portfolio)
- Code 7.4** Provide clinical advice on appropriate antibiotic use. Keep a diary that records de-identified patient history, advice given and outcomes on up to 10 patients.
- Code 7.5** Other (please specify)

For each activity, trainees must write a one page (maximum) reflection on what they gained from the activity.

At the end of each year, this form, appended reflections and any other appended documentation should be sighted by the supervisor and signed off on the annual supervisor report.

Trainee name			Trainee ID	Stage of training Y1 Y2 Y3 Y4 Y5 if > Y5 please specify				
Date	Code	Brief description of activity (including committee name, location, where relevant)			Supervisor signature			
1								
2								
3								
4								
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10								

Appendix 7

Major project proposal and project guidelines

The major project is a significant piece of laboratory-based research work related to the pathogenesis, antimicrobial therapy or diagnosis of infectious diseases. The trainee must personally have done at least 80% of the bench work either supervised or unsupervised. The project should demonstrate the trainee's ability to plan, perform and present the results of a scientific investigation in medical microbiology. A solely clinical project is not appropriate for satisfying this component of the joint training program.

Examples of **suitable** major projects would be:

- The development of an assay (molecular or serological), novel bacteriological bench tests, utilisation of MALDI-TOF for novel testing eg: susceptibility testing, virulence determination etc.
- The development and assessment of novel media
- Typing studies. Eg MLST, that have been done by the candidate
- Sequencing projects: It is acknowledged that most trainees would not have the skills to undertake a sequencing project unaided. If this is to be a major part of the project, then the candidate must demonstrate that they have spent sufficient time with the relevant bioinformatics resource person and have significantly participated in the process.

Examples of **unsuitable** major projects would be:

- A basic comparison of commercial test kits or platforms as part of validation
- A review of laboratory data relating to susceptibility testing or test methods used where these tests were not performed by the candidate themselves
- A literature review or meta-analysis
- A report on an outbreak where typing of isolates was not done by the candidate
- A clinically based study eg: the efficacy of one intervention compared with another.

BEFORE commencing the project, the topic should be discussed with the supervisor and a written proposal must be prepared in consultation with the supervisor. If there is any uncertainty about the suitability of the topic, please write to the Examinations Officer at College who will refer your query to the Chief Examiner. exams@rcpa.edu.au

The approved proposal, signed by supervisor, should be submitted to the RCPA as soon as it is approved and no later than the closing date for enrolling for the Part II examination. The project proposal form is in **Appendix 7**.

The following assessment criteria will be used by the major project examiners:

- Are the project aims well formulated (e.g. scope, purpose, desired outcomes)? (15 marks)
- Are the background conditions described in sufficient detail to provide a rationale for the project? (10 marks)
- Are relevant concepts and findings critically reviewed to draw light on the subject matter of the project? (25 marks)
- Are the methods appropriate to the project aims; do they reflect an adequate amount of effort? (10 marks)
- Are the findings well summarized? (10 marks)
- Are the findings interpreted appropriately and discussed adequately? (10 marks)
- Are the lessons derived from project discussed adequately; are the implications related to the candidate's own situation? (20 marks)


Other research alternatives to the major project are:

- A paper of which the trainee is senior or sole author, published in a refereed medical journal;
- A completed and accepted thesis for a higher degree;

Project planning may begin at any stage of training. The proposal must have been approved by the supervisor before commencing and the project must be completed after the Part I examination and submitted on the due date, prior to the Part II oral examination.

Attach the completed cover sheet and declaration of originality to the project report and submit three (3) copies to the College for examination by the chief examiner and two other examiners. Keep your own copy of the project because the copies you send to the College will not be returned to you.

If, in the opinion of the examiners, the project work is inadequate, you will be asked to revise and resubmit the work. A pass in the Part II assessment will be delayed until the project has been graded as satisfactory

 <b style="font-size: 2em; margin-left: 10px;">RCPA <small>The Royal College of Pathologists of Australasia</small>	<h2 style="margin: 0;">Microbiology</h2> <h3 style="margin: 0;">Major project proposal form</h3>	
<p>How to use this form</p> <p>The purpose of the major project proposal is to enable your supervisor to ascertain whether your plan is feasible and whether the resulting project is likely to meet the expected standard. It is important to consult your supervisor during the process of developing the proposal and to commence only after receiving your supervisor's approval.</p> <p>The aim of the major project is to introduce trainees to planning and conducting research, critical analysis of the literature and to improve written scientific communication skills.</p> <p>DUE DATE: The approved proposal, signed by the supervisor, should be submitted to the RCPA within 6 months (or FTE) of having completed the Part I examinations for single-discipline trainees or before the closing date for enrolling for the Part II examination for joint RCPA/RACP trainees.</p>		
Trainee name	Trainee ID	Stage of training Y1 Y2 Y3 Y4 Y5 if > Y5 please specify
Project title		
<p>Preliminary literature review – <i>please attach separate pages.</i></p> <p><i>This should be brief – just enough to summarise and evaluate current knowledge in the field and show why the project is worth doing.</i></p>		
<p>Methodology - <i>please attach separate pages.</i></p> <p><i>Outline and justify the method/s you propose to use. If you intend to collect data, specify the type of data, list the variables of interest and the method/s of analysis, including statistical methods. Include a detailed list of equipment and any other resources you will need.</i></p>		
<p>Ethics approval</p> <p><i>If ethics approval is needed, state the committee from which it will be obtained. Indicate how long this will take</i></p>		
<p>Schedule - <i>please attach separate pages.</i></p> <p><i>Include a schedule with target dates and a Gantt chart for each phase.</i></p>		
<p>Declaration by laboratory supervisor</p> <p>I hereby give approval for traineeto undertake the project specified in this proposal and confirm that the project will be undertaken after the Trainee has passed the RCPA Part I examinations.</p> <p>Supervisor name</p> <p>Supervisor signature and date</p>		
<p>Declaration by project supervisor (if different to the laboratory supervisor)</p> <p>I hereby agree to supervise traineewhile undertaking the project specified in this proposal and confirm that the project will be undertaken after the Trainee has passed the RCPA Part I examinations.</p> <p>Supervisor name</p> <p>Supervisor signature and date</p>		



**Microbiology Part II
MAJOR PROJECT cover page**

Please attach this cover page to the major project when submitting for examination.

Name of Trainee.....

Name of Supervisor.....

Laboratory.....Date submitted.....

Title of major project.....

Who conceived of this project? If not you alone, please describe your involvement.

Was ethical approval required for the project? No Yes

Give details

Were patient samples used in this project? No Yes

If yes, who collected the samples?

Who stored the samples?

Who tested the samples?

Who entered the data?

Who analysed the data?

How was the project funded? (eg laboratory budget, research grant, commercial grant, other?)

Please state any potential or actual conflict of interest associated with the project

Has the work been, or will it be, submitted for publication? No Yes

Who assisted you with the project? (name, position)

Trainee's declaration: "I certify that I undertook this project during my accredited training in microbiology. The project is original and has not been used by any other trainee in this laboratory. I have read and understand RCPA Policy 10/2002 on Plagiarism and Cheating in Examinations.

Trainee signature.....date.....

Supervisor's declaration: I certify Dr.undertook this project during training in microbiology. The work is original and has not been used by any other trainee in this laboratory. I have reviewed this project report and read the project requirements and believe it is suitable for submission to the RCPA examiners

Supervisor name (print) signature.....

date.....

Appendix 8

Minor project guidelines

The minor project report should demonstrate the Trainee's understanding of laboratory practice. The report should be 1000 – 3000 words, plus references. It must be the work of the candidate alone and must not have been submitted for assessment previously, eg, to satisfy the infectious diseases project requirements of joint training program candidates.

Suitable projects may include, but are not restricted to:

- Case based report focusing on the laboratory issues of diagnosis and testing;
- Literature review of a relevant topic;
- Audit of a specific test, with recommendations for change if appropriate, including cost, turnaround times, sensitivity, specificity and measurement of uncertainty

The project can be completed at any time after the Part 1 examination. Please refer to the *RCPA Trainee Handbook – Administrative Requirements* (on the RCPA website) for the due date.

Attach the completed cover sheet and declaration of originality to the project report and submit three (3) copies to the College for examination by the chief examiner and two other examiners. Keep your own copy of the project because the copies you send to the College will not be returned to you.

The following assessment criteria will be used by the minor project examiners:

- Scholarship (including literature review & references) (50 marks)
- Logical approach to topic (25 marks)
- Clarity of discussion (10 marks)
- Presentation including grammar and spelling (5 marks)
- Originality (10 marks)

If, in the opinion of the examiners, the project work is inadequate, you will be asked to revise and resubmit the work. A pass in the Part II assessment will be delayed until the project has been graded as satisfactory.



**Microbiology Part II
MINOR PROJECT cover page**

Please attach this cover page to the minor project when submitting for examination.

Name of Trainee.....

Name of Supervisor.....

Laboratory.....Date submitted.....

Title of minor project.....

Type of project

- Case report – focusing on diagnosis and testing
- Audit of a laboratory test
- Literature review
- Other (please specify)

Trainee’s declaration: "I certify that I undertook this project during my accredited training in microbiology. The project is original and has not been used by any other trainee in this laboratory. I have read and understand RCPA Policy 10/2002 on Plagiarism and Cheating in Examinations.

Trainee signature.....date.....

Supervisor’s declaration: I certify Dr.undertook this project during training in microbiology. The work is original and has not been used by any other trainee in this laboratory. I have reviewed this project report and read the project requirements and believe it is suitable for submission to the RCPA examiners.

Supervisor name (print)
.....signature.....date.....

Appendix 9

Assessment matrix

	Outcomes to be assessed Outcomes are organised according to the RCPA common curriculum framework	Assessment method (see key below)									
		Part 1			Part 2				Portfolio		
		A	B	C	D	E	F	G	H	I	J
1.1	Foundation knowledge and skills	X	X	X							
1.2	Public health and preventive medicine	X		X			X			X	X
1.3	Use of antimicrobial agents	X		X			X			X	X
1.4	Infection control	X		X			X			X	X
1.5	Pre-analytic: select, collect, transport specimens	X		X			X		X	X	X
1.6	Pre-analytic: selection of tests	X	X	X			X		X	X	X
1.7	Analytic: microscopy	X	X	X			X		X	X	X
1.8	Analytic: culture	X	X	X			X		X	X	X
1.9	Analytic: identify microorganisms to species level	X	X	X			X		X	X	X
1.10	Analytic: non-culture detection – not microscopy	X	X	X			X		X	X	X
1.11	Analytic phase: susceptibility testing	X	X	X			X		X	X	X
1.12	Analytic: manage specimens, equipment, data	X	X	X			X		X	X	X
1.13	Post-analytic phase: report generation		X				X		X	X	X
2.1	Quality management: assurance & control		X	X	X	X	X	X	X	X	X
2.2	Laboratory safety		X	X	X	X	X	X	X	X	X
2.3	Compliance with local legislation		X	X	X	X	X	X	X	X	X
2.4	Manage people						X			X	X
2.5	Manage resources						X			X	X
2.6	Information fundamentals		X		X	X		X	X		X
3.1	Research and critical appraisal				X	X	X	X		X	X
3.2	Undertake self-education and CPD				X	X		X		X	X
3.3	Educate colleagues staff, patients/families						X				X
3.4	Provide data for planning and evaluation				X	X					X
4.1	Ethics and confidentiality				X	X	X	X		X	X
4.2.1	Communication - oral		X	X			X			X	X
4.2.2	Communication – report writing		X			X					X
4.2.3	Communication – academic writing				X	X		X			X
4.3	Collaboration and teamwork		X		X	X	X				X
4.4	Cultural competence			X			X			X	X

Assessment methods	
A Part 1 written exams A and B	J Portfolio evidence in the following categories
B Part 1 wet practical exam in own laboratory	Safety
C Part 1 structured oral exam	Incident reports
D Part 2 major project: scientific investigation	Presentations at clinical meetings
E Part 2 minor project: on laboratory practice	Research and scholarship activities
F Part 2 structured oral exam	Quality
G Part 2 research thesis, eg PhD	Management
H DOPS: directly observed practical skills	Ethics
I CbD: case-based discussion	Cultural competence