

(A) INTRODUCTION

Definition

This training programme outlines the requirements and guidelines for the training and eventual graduation of a Consultant Chemical Pathologist.

Objective(s) of Training

The objective is to train chemical pathologists

- to lead and manage a competent, effective and reliable clinical chemistry laboratory so that maximum benefit may be gained for patient care
- to effectively contribute the investigation and management of patients, especially in the area of metabolic medicine.

By end of the training, trainee is expected to acquire comprehensive skills and knowledge in:

a. Specialized factual knowledge of:

1. biochemistry, physiology & general pathology
2. biochemical basis of disease
3. clinical chemistry analytical methodology and techniques,
4. statistics relevant to laboratory medicine
5. application of results of laboratory tests to the investigation and management of patients

b. Interpretative skills

The trainee must gain the skills for interpreting clinical chemistry laboratory data and functioning as a member of multidisciplinary clinical care teams. He/She should be adept at communication with clinical colleagues and knowing when it is appropriate to initiate clinical contact on the basis of abnormal laboratory results. These skills can only be gained through involvement at the laboratory – clinical interface, with experience in collaborating with clinical colleagues in the investigation and management of patients.

c. Technical knowledge

The trainee must be familiar with the methodology, analytical procedure and interpretation of all tests commonly performed in the clinical chemistry laboratory. In addition, he/she must be aware of state of the art and recent developments in this area, particularly, alternative methods of analysis, new tests or new instrumentation. The trainee's technical knowledge and practical competence should be of a standard such that the allied health laboratory professionals will both seek and value their advice. These skills can only be gained from close acquaintance with laboratory technology, so that methodology appropriate to a clinical question can be chosen, and so that effective quality control and quality assurance procedures can be implemented.

d. Data Management skills

The trainee should be adept at the use of spreadsheets, databases and statistical packages that are relevant to laboratory medicine. He/She should also be familiar with general Laboratory Information System (LIS) principles.

e. Laboratory Safety

Familiarity with all aspects of health and safety requirements for laboratories.

f. Management and communication skills

The trainee is expected to gain knowledge and experience in the management and administration of clinical chemistry laboratory so that it can operate efficiently and effectively. Topics such as staff relationships, motivation and training, laboratory safety, equipment and chemical purchasing, budgets, allocation of resources, and forward planning should be covered. The trainee must gain experience, under supervision, in planning departmental policies and develop the leadership skills necessary to implement them.

g. Research and development

Original thought and critical assessment of published work are important to allow the trainee to contribute in a team, and individually, to the development of the clinical biochemistry laboratory service.

h. Teaching and Education

The trainee is expected to acquire knowledge and skills that allows him/her to competently and actively teach

- 1) allied health laboratory professionals on matters relating to result interpretation in the clinical setting
- 2) medical and nursing staff and students on laboratory science and technical matters

(B) PROGRAMME OVERVIEW

Traineeship Duration for Seamless Training

5 years, *starting from registration as a trainee*

(C) ADMISSION REQUIREMENTS

Entry Criteria/ Pre-requisites

Applicants must fulfill the following entry criteria/ pre-requisites as stated below:

Prior to commencing specialist training, trainees should have completed

1. at least one year of pre-registration experience (Housemanship)
2. at least one year of post-Housemanship experience, *following qualification as a medical practitioner; of which 6 months in a clinical non-laboratory posting is mandatory.*
Prior to commencing specialist training, trainees are also strongly encouraged to complete a 6-month laboratory medicine posting.

(D) TRAINING SYLLABUS

In lieu of a Singapore-based exit examination in Chemical Pathology, the training programme is based on fulfilling the training requirements that qualify the trainee to attempt either

1. the Fellowship examinations, FRCPA (Basic Pathological Sciences, Part I and Part II) of the Royal College of Pathologists of Australasia, or
2. the Fellowship examinations, FRCPath (Part 1 and Part 2) of the Royal College of Pathologists, UK

For trainees on either scheme, the training will be over a period of a minimum of 5 years, notwithstanding RCPA and/or RCPPath prevailing policies on the timing of Part 2 exams. JCST/STC will conduct an exit assessment and have final jurisdiction on the trainee's exit eligibility.

FRCPA (Chemical Pathology) training and examination track

The RCPA Trainee Handbook, available on the college website, contains updated information on:

1. Details and Format of the examination process
2. Knowledge and Experience to be attained in Chemical Pathology
3. Table of Tasks, Learning Outcomes, Activities and Assessment in Chemical Pathology

1. FRCPA Pathological Sciences

This is to be taken by end of second year of training. The trainee should have a deep understanding of the scientific basis of pathological practice and basic mechanism of disease processes. He must also be familiar with the areas of advancing knowledge in the practice of pathology.

2. FRCPA Part I Examination

The trainee can attempt this exam from the third year of training. By then he/she should have a sound understanding of and practical familiarity with:

- a. The instruments, techniques and analytical procedures being performed in an approved laboratory

The trainee must be familiar with the use, method of analysis, analytical procedure and interpretation of all tests commonly performed in the clinical chemistry laboratory. In addition, he must be aware of the commonly performed tests and developments in this area, relating to alternative methods of analysis, new instrumentation and new tests.

The trainee's technical knowledge and practical competence should be of a standard such that the non-medical laboratory staff will both seek and value their advice on technical matters. He should not only be familiar with the equipment within their own laboratory, but also be aware of recent advances in laboratory instrumentation.

- b. The interpretation of laboratory results with respect to both the patient's disease and test reliability

The trainee must be skilled at interpreting laboratory data, particularly as they contribute to the solving of clinical problems. These skills can only be gained through involvement at the laboratory – clinical interface, with experience in co-operating with clinical staff in the investigation and management of patients. He should know when it is appropriate to initiate clinical contact on the basis of abnormal laboratory results as well as being receptive to enquiries from the clinical staff.

- c. Laboratory Management

Knowledge of the administration of the laboratory so that it can operate efficiently and effectively will be expected. Topics such as staff relationships, motivation and training, laboratory safety, equipment and chemical purchasing, budgets, allocation of resources, and forward planning should be covered.

- d. Research

It is expected that he/she will have undertaken some original investigative work during this period of training, and have been peripherally involved in a number of other research projects. He/she is encouraged to present formal papers at recognised conferences and to publish his original research work.

3. FRCPA Part II Examination

The trainee can attempt this exam from the fifth year of training.

By the end of advanced training, the trainee should have a thorough and deeper understanding of chemical pathology as applied to the clinical situation. The Part II exam moves from technical/scientific elements to an integration of this knowledge with clinical and managerial elements. The scientific/technical elements are assumed to be in place, and will not be further examined except in the context of addressing a particular

clinical problem. The ultimate goal of this examination is to determine whether the candidate has the knowledge, skills and communication ability necessary to function as a consultant.

FRCPath (Chemical Pathology) training and examination track

The examination is the appropriate professional qualification for medical trainees to progress to specialisation in Chemical Pathology, to ultimately enable them to practise chemical pathology at consultant or consultant-equivalent level and to acquire management skills sufficient to lead a department, thereby ensuring that they are able to provide a competent, effective service so that maximum benefit may be gained for patient care.

Trainees are advised to refer to the College website on www.rcpath.org.uk

The FRCPath examination is a key assessment tool (but not the only one) used at 3 stages of training.

1. FRCPath Part 1 Examination

The trainee can attempt this exam from the third year of training. The trainee will be assessed on the following:

1. Core knowledge base
2. Basic Laboratory Skills
3. Integration of laboratory data with clinical situations

The core curriculum is published by the College Advisory Training Team (CATT) for Clinical Biochemistry. Broad topic areas include:

1. Laboratory management competencies
2. Analytical techniques and instrumentation
3. Analytical methodology
4. The chemical pathology of disease – biochemical basis, diagnosis and principles of management, and the basis of metabolic medicine

The examination comprises written papers, practical papers and an oral examination.

2. FRCPath Part 2 (Module 3 – Written component)

The trainee can attempt the written component between 2nd and 4th years of training, and they must obtain project proposal agreement from Royal College of Pathologists before starting the project. It will be assessed based on the following:

- a. Ability to formulate questions that can be answered by laboratory means
- b. Ability to undertake self-directed laboratory work
- c. Ability to write up work in standard scientific format

The written component is in the form of either a dissertation, portfolio of papers or evidence of a higher degree.

3. FRCPath Part 2 (Oral) Examination

The trainee can attempt this exam from the fifth year of training and will be assessed on the following:

- a. Clinical patient management (Medical)
- b. Laboratory problem solving (Scientist)
- c. Laboratory management
- d. Readiness for independent practice

The examination is in the form of a prepared and extended oral examination.

General Requirements

1. Teaching
The trainee is expected to take an active part in teaching of undergraduates, medical officers, allied health professionals and nurses.
2. Clinical Chemistry Laboratory Rotations
The trainee must rotate out of his/her host clinical chemistry laboratory for at least 6 months or according to FRCPA or FRCPPath requirements, whichever is longer.
3. Clinical Non-laboratory Rotations
Clinical Rotations are an essential part of training in Chemical Pathology and the training program should include appropriate clinical rotations, keeping in view RCPA and RCPPath requirements. FRCPPath, in particular, expects the trainee to attain capabilities to provide direct clinical care to patients in the following five areas of metabolic medicine:
 - nutrition
 - inborn errors of metabolism in adults
 - cardiovascular risk management and disorders of lipid metabolism
 - disorders of calcium and bone metabolism
 - diabetes mellitus
4. Research and Presentations
The trainee will participate in research projects and present posters or give oral presentations at relevant local, regional and international meetings.

(E) INSTITUTIONAL REQUIREMENTS (FACILITIES & RESOURCES)

1. The Pathology or Laboratory Medicine Department must provide a comprehensive clinical chemistry laboratory service to a general hospital that
 - a. see a wide range of medical, surgical and emergency cases.
 - b. hosts a 24-hour Emergency Department.
 - c. hosts intensive care facilities.
2. The laboratory should have adequate trained full-time staff, including chemical pathologists and allied health professionals.
3. There should be regular journal clubs, joint conferences and audit reviews.
4. The hospital must have online access to a wide range of appropriate journals and medical texts.
5. The laboratory must be accredited where applicable e.g. RCPA requires the laboratory to be accredited by RCPA prior to training of trainees.

(F) SUPERVISION OF TRAINEES

Appropriate supervisors include chemical pathologists with FRCPA or FRCPPath qualifications.

A supervisor should be identified for each trainee, although all chemical pathologists and allied health professionals are duty bound to take an active part in teaching. Assessment of training progress and logbooks should take place at least 6 monthly.

It is advised that a full-time chemical pathologist should not be supervising more than 2 trainees.

A trainee who has passed the respective FRCPA or FRCPPath Part 1 exams (i.e. a senior trainee) can be appointed to assist with supervision of a trainee who is in his/her first 3 years of training (ie. the junior trainee). However, formal appointment of senior trainee as supervisor of a junior trainee should only be carried out if

1. the supervisor to trainee ratio of 1:2 cannot be met under extenuating circumstances and
2. each senior trainee may only supervise one junior trainee and

3. after approval by the STC and
4. there is a minimum of 3-year gap between the senior and junior trainee and
5. the senior trainee's supervisor must countersign all forms of assessment of training progress, logbooks and performance appraisals.

(G) ASSESSMENT AND FEEDBACK

Logbook

All trainees are expected to keep a log book that records training activities and milestones in compliance with FRCPA or FRCPath requirements and is reviewed on a monthly basis by the supervisor.

Assessment and Feedback

Trainees are appraised at least every 6 monthly.

During the open appraisal, interviews with the trainees should be conducted to ensure that the training objectives for each rotation have been adequately met, as well as to monitor for any difficulties in workload and training activities. Feedback should be provided to the trainee at the end of every 6 months or at the end of each rotation, whichever is shorter. The appraisal of a senior trainee should take into account the time and effort committed by a senior trainee towards supervising a junior trainee.

(H) EXIT EXAMINATION AND ASSESSMENT

In lieu of a Singapore-based exit examination in Chemical Pathology, the training programme is based on fulfilling the training requirements that qualify the trainee to attempt and pass either

1. the Fellowship examinations, FRCPA (Pathological Sciences, Part I and Part II) of the Royal College of Pathologists of Australasia, or
2. the Fellowship examinations, FRCPath (Part 1 and Part 2) of the Royal College of Pathologists, UK

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Exit Examination Format

FRCPA training and examination track

Complete FRCPA Part II Examination and Portfolio requirements.

FRCPath training and examination track

Complete FRCPath Part 2 Examination and Portfolio requirements.

(I) GENERAL GUIDELINES

Please refer to Annex 1 for General JCST Guidelines on the following:

1. Leave Guidelines
2. Training Deliverables
3. Retrospective Recognition
4. Changes to Training Period
5. Part-time Training
6. Overseas Training
7. Withdrawal of Traineeship
8. Exit Certification

(J) APPLICATION FOR SEAMLESS TRAINEESHIP

Eligible doctors may enquire with the Joint Committee on Specialist Training (JCST) Secretariat on the next Seamless intake exercise.

Shortlisted applicants will be required to attend an interview.

All successful applicants will be issued with an offer letter of traineeship and are required to revert with their acceptance of traineeship offer to JCST. All successful applicants must be formally registered as a Trainee with the JCST Secretariat prior to commencement of traineeship.