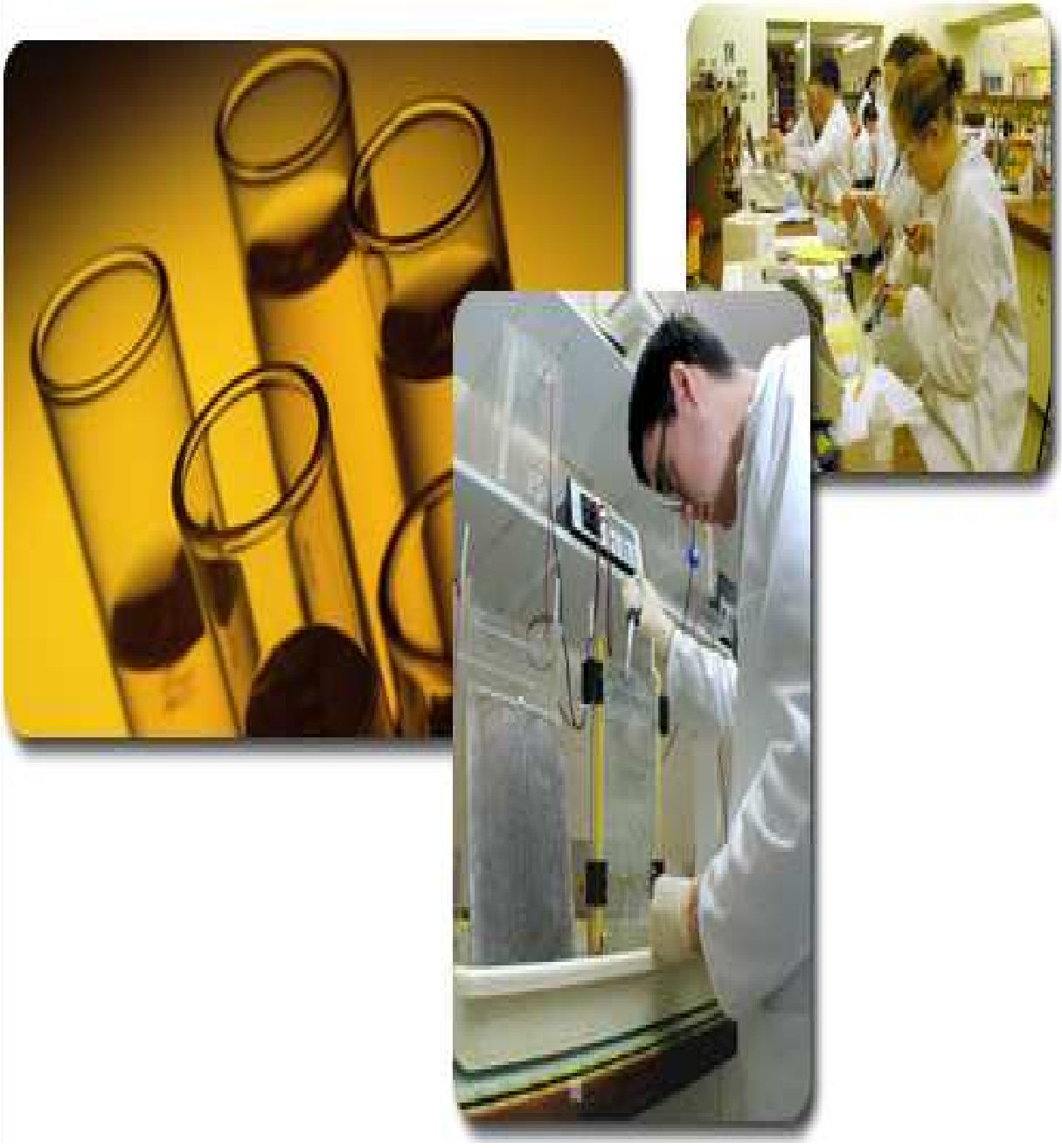
OMAN MEDICAL SPECIALTY BOARD

Clinical Biochemistry

Clinical Biochemistry Residency Program



Information Booklet

June 2009

CLINICAL BIOCHEMISTRY SCIENTIFIC COMMITTEE MEMBERS

CHAIRMAN
PROF. RIAD BAYOUMI

PROGRAM DIRECTOR
DR. MAHA AL-AMRI

ASSISTANT PROGRAM DIRECTORS
DR. WAAD MULA ABED
DR. DAVID NKANSA-DWAMENA

MEMBERS
DR. JUMANA SALEH
DR. NADIA AL-WARDY
DR. KHALID HUMAID MOHAMMED AL RASSADI
DR. ASILA KHALIFA AL-MUSHEIFRI
DR. MANAL KHALIFA ABDULLAH AL-KINDI

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INTRODUCTION

Clinical biochemistry encompasses both practical laboratory and clinical skills. The award of the Certificate of Completion of Training (CCT) will require evidence of satisfactory completion of training in both the Good Medical Practice and core aspects of Clinical Biochemistry, which are outlined in this curriculum. The curriculum complies with the Postgraduate Medical Education and Training Board Recommendation of the Oman Medical Specialty Board (OMSB) that will be integrated to produce a coordinated training package. The relevant documentation of the curriculum has been developed with reference to the curriculum recommended by the Royal College of Pathologists, UK.

MISSION

To set standards for training of Medical graduates to attain a competency level of consultant in Clinical Biochemistry during a period of 5 years.

VISION

The Clinical Biochemistry Training Program will develop and prepare graduates to lead a full and comprehensive high quality clinical biochemistry service in the hospital.

GENERAL OBJECTIVES

The objectives of the OMSB (Oman Medical Specialty Board) of Clinical
Biochemistry Fellowship program are to provide:

- Experience of laboratory practice to attain an understanding of biochemical processes with pathological change, rationale for investigation and treatment of disease and interpretation of test results
- Experience of diagnostic techniques required to become technically competent, and to master the underlying principles
- The opportunity to gain knowledge of specialist area such as pediatric clinical biochemistry and toxicology
- The acquisition of ability to provide special opinion acquisition of management skill to lead a department providing an effective service
- Experience of conducting developmental projects research, audit studies through evaluation of practice
- Training in the communication and teaching |skills necessary for effective practice

SPECIALTY ADMISSION REQUIREMENTS

1. He/she must be a holder of Bachelors Degree in Medicine & Surgery or equivalent from a University recognized by the OMSB.
2. He/she must have completed a year of internship.
3. He/she must be of good conduct & medically fit for the specialty.

4. He/she must provide three letters of recommendation from three consultants with whom he/she has worked confirming his/her ability & capability of training.
5. He/she must submit a letter of approval from his/her sponsor confirming permission to join the OMSB Specialty Training Program on full time basis for the entire period of training.
6. He/She must pass the interview.
7. The Scientific Committees may add other conditions, oral or written exams, or tests for admission as approved by OMSB.
8. The trainee must fulfill the additional conditions & pass the oral and written examinations set by the program.
9. The trainees are selected as per the OMSB rules & regulations.

Trainees are eligible for entry to a clinical biochemistry training programme following satisfactory completion of a foundation training programme or equivalent. This is usually achieved by a minimum of 2 year post-graduation clinical training. Selection of the trainees will be achieved following an interview, prior to entry to the programme, by the OMSB Clinical Biochemistry Committee.

STRUCTURE OF TRAINING PROGRAM

Duration of Program

The OMSB anticipates that training of five and half years duration would normally be required to satisfactorily complete the clinical biochemistry curriculum to the required depth and breadth. The CCT in clinical biochemistry will be awarded on the recommendation of the OMSB following evidence of:

- satisfactory completion of the clinical biochemistry curriculum (including workplace based assessments) and the minimum training period
- attainment of the OMSB's Clinical Biochemistry Year 1 Assessment and OMSB membership examination or FRCPath examination

Core Structure / Core Clinical Biochemistry (Stage A : R1, R2 And R3)

1. LABORATORY COMPETENCIES

Introduction to clinical biochemistry

Objectives:

To achieve sufficient knowledge of laboratory clinical biochemistry to offer basic advice on the interpretation of results.

Analytical Techniques and Instrumentation

Objectives:
To become competent analyst in a range of analytical techniques, their performance, comparative usefulness and applications so as to be competent in the management of the clinical biochemistry laboratory.

Evaluation of an Analytical Method

Objectives:
Knowledge of the processes required to establish and validate a new method.

2. CLINICAL GOVERNANCE AND AUDIT COMPETENCIES

Objectives:
Knowledge of the lines of accountability, quality improvement programmes, clinical audit, evidence-based practice, clinical standards and guidelines, managing risk and quality assurance programmes.

3. COMPETENCIES IN CLINICAL BIOCHEMISTRY OF DISEASES

Objectives:
To relate understanding of normal human biochemistry and physiology to the clinical biochemistry of screening, diagnosis and monitoring of disease. Should be fully conversant with generic aspects.

4. COMPETENCIES IN THE INTERPRETATION OF LABORATORY DATA

Objectives:
With supervision, ability to safely advise on the interpretation of laboratory results in diagnosis, treatment and monitoring of patients.

To attain a level of knowledge of clinical practice, giving the ability to conduct a dialogue with clinical colleagues:

- appropriate selection of tests
- interpretation of their results
- initiation of further investigation based on these results.

5. COMPETENCIES IN RESEARCH AND DEVELOPMENT

Objectives:
Critical assessment of published work and an understanding of basic statistical methods.

6. COMPETENCIES IN DIRECT PATIENT CARE

Generic aspects of clinical management

Objectives:
Competent in the generic clinical and communication skills required for assessment and treatment of patients, referred for a specialist biochemical opinion, within an outpatient setting. Regular attendance at appropriate outpatient clinics under Consultant supervision is required.

Core Clinical Biochemistry
(Stage B : R4 And R5)

1. LABORATORY COMPETENCIES

1.1. Introduction to clinical biochemistry

Objectives:
To achieve sufficient knowledge of laboratory clinical biochemistry to offer basic advice on the interpretation of results.

1.2. Analytical techniques and instrumentation

Objectives:
To become a competent analyst with appreciation of a range of analytical techniques, their performance, comparative usefulness and applications so as to be competent in the management of the clinical biochemistry laboratory.

1.3. Evaluation of an analytical method

Objectives:
Competence to establish and validate a new method.

2. LABORATORY MANAGEMENT COMPETENCIES

Objectives:
To develop skills to take independent responsibility for the direction and management of the service for example choosing new analyzer, quality management, accreditation and laboratory safety.

3. CLINICAL GOVERNANCE AND AUDIT COMPETENCIES

Objectives:
Knowledge of the lines of accountability, quality improvement programmes, clinical audit, evidence-based practice, clinical standards and guidelines, managing risk and quality assurance programmes.

4. COMPETENCIES IN CLINICAL BIOCHEMISTRY OF DISEASES

Objectives:
To relate understanding of normal human biochemistry and physiology to the clinical biochemistry of screening, diagnosis and monitoring of disease.

5. COMPETENCIES IN THE INTERPRETATION OF LABORATORY DATA

Objectives:
Ability to advice on the interpretation of laboratory results in diagnosis, treatment and monitoring of patients.

To attain a level of knowledge of clinical practice, giving the ability to conduct a dialogue with clinical colleagues, confidently and competently, in relation to:

- appropriate selection of tests
- interpretation of their results
- initiation of further investigation based on these results
- contribution to the construction, organization and interpretation of clinical research projects.

6. COMPETENCIES IN RESEARCH AND DEVELOPMENT

Objectives:
Experience in research and development to develop skills in independent and team-driven problem solving, critical assessment of published work and for gaining analytical expertise.

All trainees to undertake at least one research project during their first three years of training. The project should be consistent with the research and development programme of the laboratory or hospital and should be sufficiently novel and timely to be suitable for presentation at a scientific meeting and publication in a peer reviewed journal. Research for a higher degree, or for a dissertation for the Part 2 examination may be initiated during this period.

7. COMPETENCIES IN DIRECT PATIENT CARE

Generic aspects of clinical management

Objectives:
Competent in the generic and communication skills required for assessment and treatment of patients, referred for a specialist biochemical opinion within an outpatient setting. During training they become competent in all modalities but develop special interest in one or more modalities as a sub-specialty.

The trainee should be competent to diagnose and manage a patient with:

- Calcium and metabolic bone disorders
- Diabetes mellitus
- Inherited metabolic disorders
- Lipidology and cardiovascular risk assessment
- Nutrition
- Renal disease
- Thyroid disease
- Liver disorder

Outline of Major & Minor Rotations

R1

Rotation	Duration	Training Centre(s)
MSc Program	12 blocks	SQUH

R2

Rotation	Duration	Training Centre(s)
MSc Program	6 blocks	SQUH
Biochemistry	1 block	SQUH/RH
Haematology	1 block	SQUH
Adult Endocrinology	2 blocks	RH
Pediatrics Endocrinology	1 block	SQUH/RH
Metabolic Medicine	1 block	SQUH

R3

Rotation	Duration	Training Centre(s)
Nephrology	2 blocks	SQUH/RH
Neonatology	1 block	SQUH/RH
Cytogenetics	1 block	SQUH/RH
GI/Hepatology	2 blocks	SQUH/RH
Biochemistry	5 blocks	SQUH/RH
Research	1 block	SQUH/RH

R4

Rotation	Duration	Training Centre(s)
Biochemistry/Lipids	6 blocks	SQUH/RH
Research	4 blocks	SQUH/RH
Electives (Toxicology, Nutrition TPN, Genetics)	2 blocks	Abroad

**Note: Electives for R4 can be altered as necessary as per OMSB rules and recommendations from the Biochemistry Scientific Committee.

R5

Rotation	Duration	Training Centre(s)
Biochemistry	12 blocks	SQUH/RH

**Note: R5 residents will act as seniors in the laboratory with more managerial roles.

PARTICIPATING TEACHING CENTERS

- Royal Hospital Clinical Laboratory
  One Senior Consultant, One Senior Specialist
  Fully Automated Laboratory

- SQUH Clinical Laboratory
  One Professor, One Senior Consultant, One Consultant
  Fully Automated Laboratory

- Khoula Hospital
  One Senior Specialist
  Fully Automated Laboratory

MEMBERS OF TEACHING FACULTY

- One Professor (FRCPath)
- Two Senior Consultants (FRCPath)
- One Consultant (Canadian Board)
- One Consultant (PhD)
- Three Assistant Professors (PhD)

1. Members of the training faculty must be holders of specialty certificate of the training program.

2. Members of the training faculty must be experienced in the field of academic and clinical teaching.

THE TEACHING STAFF

Prof. Riad Abdel Latif Bayoumi
Dr. Maha Khalifa Mohamed Al-Amri
Dr. Waad-Allah Sharef Mula-Abed
Dr. David Nkansa-Dwamena
Dr. Khalid Humaid Mohamed Al Rasadi
Dr. Jumana S. Saleh
Dr. Nadia M. Al Wardy
Dr. Asila Khalifa Al-Musheifri
Dr. Manal Khalifa Abdulllah Al-Kindi

ROTATIONS
Stages of Training

Stage A [R1,R2,R3]:
- MSc Program.
- Prepare candidate for Part 1 Examination.
- All professional training and clinical experience gained.

Stage B [R4, R5]
- Research and Laboratory Management
- Part 2 Examination.

RATIONALE

The purpose of the curriculum for higher specialist training in clinical biochemistry is to set the standards required by the OMSB and recognized by other International Professional Bodies. This will ensure that trainees are fully prepared to lead a clinical biochemistry laboratory and related clinical service at consultant level. The educational programme provides:

- experience of laboratory practice to enable the trainee to attain understanding of biochemical process associated with pathological change, the rationale for investigation and treatment of disease and the interpretation of test results and to provide a basis for research activity
- experience of the diagnostic techniques required to become technically competent in practical work, and to master the underlying analytical and clinical principles
- the opportunity to gain knowledge of the metabolic changes that occur in disease
- the opportunity to gain knowledge of specialist areas such as paediatric clinical biochemistry and toxicology, in order to be able to provide specialist advice

- training in the communication and teaching skills necessary for effective practice
- the acquisition of the ability to provide specialist opinion in clinical biochemistry
- the acquisition of management skills to lead a department providing an effective service
- experience of research and development projects and critical assessment of published work so as to contribute in a team and individually to the development of the service
- the acquisition of life-long habits of literature searches, consultation with colleagues, attendance at scientific meetings, and the presentation of scientific work that are essential for continuing professional development
- experience of practice of clinical governance and audit (specialist and multidisciplinary) through evaluation of practice against the standards of evidence-based medicine, which underpin biochemistry practice.

The balance between practical laboratory and clinical training will be influenced by educational background, personal interests, and guidance from supervisors. The acquisition of clinical competence is required particularly in endocrinology, metabolic medicine, nutrition, inborn errors of metabolism, disorders of lipid metabolism and cardiovascular risk assessment, disorders of calcium metabolism and bone and diabetes mellitus. The curriculum will facilitate regular assessment of trainees' progress by trainees and their trainers.

STAGES OF TRAINING

There are two stages in the clinical biochemistry curriculum. Trainees may not progress to the next stage of training until they have satisfactorily completed the preceding stage.

Stage A (R1, R2 R3)

This stage consists of 3 years of full-time training. The first year of the training period (R1) will begin with MSc Program and a formal induction to the different aspects of laboratory medicine including clinical biochemistry. The trainee will undergo rotation in the different branches of the laboratory (haematology, microbiology, histopathology, cytogenetics as well as clinical biochemistry). In addition, clinical rotation in the relevant fields (endocrinology, nephrology, lipidology, paediatric / metabolic medicine) should be achieved. The trainee should focus on his/her laboratory/clinical rotation on the relationship of such field on the profession of clinical biochemistry. The trainee should also receive instruction and practical experience in general aspects of clinical biochemistry, both laboratory and clinical and different practical and theoretical courses under MSc Program. This will take 12 month training (R1) at the end of which the residents will sit for OMSB Clinical Biochemistry Year 1 Assessment (Core Examination), when they pass they move to (R2). During the second year (R2) and third year (R3), the trainees will broaden their experience and understanding of clinical biochemistry. The trainee should have a good general knowledge and understanding of most principles and practices under indirect supervision. He/she should be able to deal with most of the day-to-day issues in a hospital clinical biochemistry laboratory to an adequate level but will still require consultant input with regard to complex management and clinical issues. The trainee should complete the required training in the related clinical fields, if this has not been achieved during R1. Stage A training will be assessed by the OMSB Part 1 examination or FRCPath Part 1 examination. During this period, enrolling in a course leading to an MSc (Clinical Biochemistry), would be very beneficial and highly recommended, because not all theoretical aspects of training can be covered in the workplace. The availability of such MSc program at Sultan Qaboos

University (SQU) should encourage trainees to get benefit of it (full-time or part-time) as the core training program before Part 1 examination. Candidates who pass the FRCPath Part 1 examination (which is available bi-annually in Muscat center) may be given exemption from OMSB Part 1 examination. Acquisition of professional qualification in medicine (eg: MRCP) will be highly recommended, if the trainees possess during their study.

Stage B (R4 and R5)

Stage B of training consists of two and half year of training (R4 and R5). This stage of the curriculum enables the trainee to undertake further specialized general clinical biochemistry training and related metabolic medicine. Up to 12 months of this time may be used for an approved research project subject to prospective approval by the OMSB. If residents complete their fourth year of training (R4) in Oman satisfactory, they will move to (R5) and will be recommended to spend a minimum of 1 year advanced training in the UK, Australia or Canada. At the end of this training abroad, the resident is expected to pass the Part 2 OMSB examination or/ and FRCPath examination or/and equivalent examination The trainee should have an in-depth knowledge and understanding of the principles of clinical biochemistry satisfactorily and has completed all core and generic areas of the clinical biochemistry curriculum. He/she should be competent to discuss and deal with the subject (or, where appropriate, perform the task/procedure), demonstrating a level of clinical or professional judgment commensurate with independent professional practice at consultant level. It is anticipated that a trainee at this level should have consultant input readily available at all times where required. By the end of Stage B, the trainee should be able to demonstrate a level of knowledge and skill indicating suitability for independent professional practice in clinical biochemistry. Throughout all the stages, the trainees should be encouraged to attend relevant high specialist training courses, symposia and conferences, particularly those which are organized by academic/professional associations such as the Association for Clinical Biochemistry (ACB), UK, American Association of Clinical Chemistry (AACC) and others.

TRAINING PROGRAMMES

Training programmes should be recognized by other international colleges of interest. It should include suitable rotational arrangements to cover all the necessary areas of the curriculum and should include an appropriate balance between all the teaching hospitals. The exact rotational arrangements will vary according to the size of the departments in the various training hospitals, the number of placements on the training scheme and the number of placements on the training scheme and the number of other trainees on the training programme. The structure and operation of the training programme will ensure that every trainee is provided with an appropriate range of educational experience to complete his / her training. At present the recommended centers for training are: Sultan Qaboos University Hospital, Royal Hospital and Khoula Hospital.

CONTENT OF LEARNING

The curriculum details the level of knowledge and skill that a trainee should acquire to provide a high quality service at consultant level. The general professional and specialty-specific content of the curriculum is outlined below:

Generic skills required for Clinical Biochemistry, in accordance with Good Medical Basic knowledge and skills.

1. Laboratory aspects of Clinical Biochemistry

The trainee should aim to become a competent analyst with a thorough understanding of method development, performance and application. Extensive experience of all laboratory techniques is not expected but trainees should gain in-depth practical experience of techniques used for the commonly measured analytes, and of other more specialized techniques available as required to provide a critical insight into laboratory methodology. They should do or at least observe all other techniques listed in the curriculum. Theoretical knowledge of the analytical techniques is essential in order to develop a critical attitude to the principles underlying methods and instrumentation, their performance and usefulness in the clinical setting. Laboratory problems and calculations should be used to create learning opportunities. Trainees must become proficient in the theory and application of data handling and statistical methods.

2. Management and communication

Trainees must gain experience under supervision in formulating departmental policies and clinical guidelines and in applying the leadership and teamwork skills that are necessary to implement

them. Communication skills should be developed by report writing, presentation of data at group discussion and meetings including departmental meetings. Trainees should experience strategic planning, preparation of a business plan, contracting process, service level agreements and departmental and directorate budgeting. Formal training should be gained by attending suitable management courses. Trainees, as colleagues, should sit on departmental directorate and committee meetings as observers in order to gain experience of committee procedures, aspects of confidentiality, decision-making and the importance of maintaining good interpersonal relationships.

3. Clinical governance, clinical audit and evidence-based medicine

Clinical governance is defined by the Department of Health as ‘a framework through which NHS organizations are accountable for continuously improving the quality of their services and safeguarding high standards of care, by creating an environment in which excellence in clinical care will flourish. In clinical biochemistry, trainees must acquire knowledge of the lines of accountability, quality improvement programmes, clinical audit, evidence-based practice, clinical standards and guidelines, managing risk and quality assurance programmes. Training in these areas must continue throughout all stages of the curriculum.

4. Clinical training

Trainees must acquire a detailed understanding of biochemical process and the changes that occur in disease. They must then develop the skills to use this knowledge in the diagnosis and management of disease. They must also develop an understanding of the rationale for investigation and treatment of disease and the usefulness and limitations of laboratory tests in these settings. Trainees are not required to know every aspect, as certain condition is rare. Knowledge of where to obtain relevant information is required.

5. Direct patient care in the outpatient setting

This forms an important part of training. The specialty experience gained will vary but the majority of trainees will gain expertise in at least two areas, e.g. disorders of lipids, endocrinology, diabetes and nutrition.

6. Recent advances in the clinical and laboratory aspects of the subject as published in scientific literature

The curriculum outlines the knowledge, skills, attitudes and expertise that a trainee is expected to obtain. It is expected that every trainee should undertake the core training but it is recognized that the sequencing of learning and experience will differ according to the programme. The curriculum maps components of *Good Medical Practice* against the clinical components of clinical biochemistry.

On completion of the clinical biochemistry training programme, the trainee must have acquired and be able to demonstrate:

- appropriate attitudes in order to be able to work as a consultant
- good working relationships with colleagues and the appropriate communication skills required for the practice of clinical biochemistry
- the knowledge, skills and attitudes to act in a professional manner at all times
- the knowledge, skills and attitudes to provide appropriate teaching and to participate in effective research to underpin clinical biochemistry practice
- an understanding of the context, meaning and implementation of clinical governance
- a knowledge of the structure and organization of the Health Service
- the acquisition of management skills required for the running of a clinical biochemistry laboratory
- familiarity with health and safety regulations, as applied to the work of a clinical biochemistry department.

METHODS OF ASSESSMENT

The major summative assessment will occur towards the end of the third year of training in the shape of the OMSB Part 1 or FRCPath Part 1 examination, and towards the end of the fifth and half year of training in the shape of the OMSB Part 2 or FRCPath Part 2 examination. Continuous appraisal through training will be undertaken by the educational supervisor and other senior members of staff, including competency based assessments. The detailed procedures observe by the educational supervisor and judge to be satisfactory will be recorded in the trainee's logbook. A correctly maintained/up–to-date logbook and portfolio will be used as evidence for satisfactory progress.

SUPERVISION AND FEEDBACK

During the five and half year of specialist training, the training will be supervised by the senior medical and scientific staff on a day-to-day basis under the direction of a designated educational supervisor and OMSB Specialty Committee. Trainees are required to keep a training record detailing their training experience. Their educational supervisor, the consultant in charge of training, will inspect this on a regular basis. Trainees will be regularly informed of their progress and, in addition, must be encouraged and given every opportunity to discuss any deficiencies in the training programme. Trainees should agree a training programme (formal educational contract) with their supervisor soon after appointment. Work place based learning is unpredictable but enhances skills, efficiency and problem solving. The trainee should have a formative /supportive appraisal at least twice a year. At this informal meeting involving the educational supervisor and trainee, the educational supervisor should sign the training record and plan forthcoming training needs. Educational supervisors would be expected to have substantial experience in the specialty, to have demonstrated an interest in training, to have appropriate teaching resources, to be involved in the appropriate regional training committees, to be involve in the appropriate regional training committees, to be involve in annual reviews and to liaise closely with the Specialty Adviser.

MODEL OF LEARNING

The models of learning can be applied to any stage of training in varying degrees. The majority of the curriculum will be delivered through work-based experimental learning, but the environment within the department should encourage independent self-directed learning and make opportunities for relevant off-the job education by making provision for attendance at local, national and, where

appropriate, international meetings and courses as those organized biannually by the Association for the Clinical Biochemistry, UK. Independent self-directed learning should be encouraged by providing reference text books and journals. The rotation should also be arranged in such a way that trainees have time available for participation in research projects as part of their training or a more sustained period of working towards an MSc.

EDUCATIONAL ACTIVITIES AND WORKSHOP

The following teaching/learning methods will be used to identify how individual objectives will be achieved:

a. observation of, assisting and discussion with senior staff
b. observation of laboratory methods
c. practical bench work
d. task specific on the job training
e. laboratory and clinical team meetings
f. tailored clinical experience
g. appropriate postgraduate education courses
h. undertaking a laboratory - based project / research
i. personal study

VACATION AND LEAVE

The trainee shall be entitled to an annual leave of 30 days in addition to a maximum of 10 days in lieu of Eid holidays, official holidays and emergency leaves if required to work during these holidays and leaves.

The training period shall be extended for an equivalent period to compensate for sick leave, maternity leave and exceptional "emergency" leaves before the trainee is awarded a certificate of completion of training.

Annual leave which is not utilized in due time within the year shall not be transferred to the following year.

The trainee has the right to be granted a leave for scientific purposes (attending scientific conferences and seminars, specialty examinations ...etc) not exceeding 7 days a year provided that he/she presents the proof of attendance of such activities.

ON CALL DUTY

1. The resident must not take more than one in-house call very 4 days averaged over a month, and maximum of seven in-house calls a month.
2. A resident's shift must not exceed consecutive 24 hours and the resident should make sure that he/she hands over his/her patients to the next training group.
3. The weekend call must not exceed twice a month and each weekend call must be one day long – 24 hours – only.
4. The resident is not permitted to take more than one home call every 3 days.
5. The resident may submit shift requests to the Program Director/Chief Resident 2 weeks before the beginning of the rotation and the Program Director/Chief Resident will look into his/her request.
6. The monthly working schedule must be distributed among the residents at least one week prior to the beginning of the rotation and must be sent to OMSB office in the training center.

EVALUATION AND PROMOTION

The trainee will be evaluated by his/her consultant monthly using the approved evaluation form. These forms shall be sent to the Program Director. Reports about Residents should be submitted to the Specific Scientific Committee every two months and then sent to the trainee department files.

The trainee must complete at least 2/3 of the training period rotation for it to be considered valid.

The trainee must spend equal training periods in different training centers.

The Program Director should prepare a report every six months and at the end of the academic year using the specific evaluation form showing the progress of the trainee. This represents a summary of the trainee's performance of the two durations and the trainee has to sign it. The evaluation is then submitted to the Scientific Committee for approval and the final report is submitted to the OMSB and the Resident's Sponsor.

The Scientific Committees shall conduct annual examinations for the evaluation of trainees. The results of these examinations shall be part of the trainees evaluation process for the annual promotion purposes

A trainee's promotion from one level to the next (e.g. from a first year to a second year of training) is based on the average of the periodical assessment reports (three of four at least) which represents 50%, and the end of year examination of the training programs which represents 50%. However, a trainee must have a general average of no less than 60% and the average of the two parts of the assessment is no less than 60% of each part separately.

Completion of training shall be based on: a) the ability and performance of the trainee in the previous years as assessed by his/ her periodical evaluation reports. b) The result of the final training year examination, and the completion of the log book in the health specialties if applicable. The Scientific Committees shall submit recommendation for completion of training to be approved by the Executive Board.

EXIT QUALIFICATION

- Successful completion of the specialty training program for the period approved and passing end of the year examination as well as part one examination.
- Completion of training certificate from the OMSB.
- The exam will be held once every year.
- The examination may consist of written, orals, and OSCE.
- The resident who does not pass the exam may repeat the examination within six months after the approval of the Scientific Committee.
- The trainee may take the exam for a maximum of three times. In case the trainee does not succeed the third time, he/she may be granted a fourth attempt by the Board of Trustees in exceptional cases.
- The passing score is 70%. However, if the percentage of the candidates passing the examination is less than 70%, the passing score can be lowered by one mark at a time aiming at achieving 70% passing rate or score of 65% or which ever comes first. Under NO Circumstances, the score can be reduced below 65%. Negative marking is not allowed.
- The Scientific Committee may change the format and passing score of examinations after the approval by the Executive Board.

- The OMSB shall provide the Oman Medical Board Specialty Certificate following the completion of the training program and passing the final examination.

SUGGESTED READING MATERIALS

Core Journals

Annals of Clinical Biochemistry
Clinical Chemistry
JAMA (The Journal of the American Medical Association)
Journal of Clinical Endocrinology and Metabolism
New England Journal of Medicine
British Medical Journal
Diabetic Care

Textbooks

1. Clinical Chemistry & Metabolic Medicine 7th Edition by Martin A. Crook
Year of publication 2006
ISBN – 0-340-90617-0-(International Student's Edition)
Publisher: Hodder Arnold

2. Clinical Chemistry: Theory, Analysis, Correlation.
By: Lawrence A. Kaplan PhD DABCC FACB (Author)
Amadeo J. Pesce PhD DABCC FNACB (Author
Product Details

- Paperback: 1200 pages
- Publisher: Mosby; 5 edition (July 3, 2009)
- Language: English
- ISBN-10: 0323036589
- ISBN-13: 978-0323036580

3. Tietz Textbook of Clinical Chemistry and Molecular Diagnosis, 4th Edition, by Carl A. Butris, Edward R. Ashwood and David E. Burns. Publisher: Elsevier Saunders. ISBN 13:978-0-7216-0189-2.

Additional List

1. Clinical Biochemistry, Metabolic and Clinical Aspects, 1st Edition, by Wiliam J. Marshall and Stephen K. Bangert. Publisher: Churchill Livingstone. ISBN 0443-043418

2. Analytical Biochemistry, 3rd Edition, by David J. Holme and Hazel Peck. Publisher: Prince Hall. ISBN 13:978-0-582-29438-7

3. Introduction to Biochemistry Toxicology, 3rd Edition, by Ernest Hodgson and Robert C. Smart. Publisher: Wiley Interscience. ISBN 0-471-33334-4.

4. Clinical Chemistry by Ken Lewandrowsky, ISBN 0683-30085-7

5. Basic QC Practices Manual, Westgard.

6. Medical and Endocrinology Textbook.

7. Cases in Chemical Pathology: A Diagnostic Approach, RN Walmsley, LR Watkinson & ESC Koay. Publisher: World Scientific Publishing Co. PTe. Ltd. ISBN: 981-02-1067-1

RESEARCH

R4 and R5 of training consist of two and half years. This stage enables the trainee to undertake further specialized general clinical biochemistry training and related metabolic medicine. Up to 12 months of this time may be used for an approved research project subject to prospective approval by the OMSB. The rotation should also be arranged in such a way that trainees have time available for participation in research projects as part of their training or a more sustained period of working towards an MSc.

The experience in research and development is to develop skills in independent and team-driven problem solving, critical assessment of published work and for gaining analytical expertise.

All trainees are to undertake at least one research project during their first three years of training. The project should be consistent with the research and development programme of the laboratory or hospital and should be sufficiently novel and timely to be suitable for presentation at a scientific meeting and publication in a peer reviewed journal. Research for a higher degree or for a dissertation for the Part 2 examination may be initiated during this period.

CONTACT DETAILS

OMSB ADDRESS
P.O. Box 1948 Postal Code 130
Al Athaiba, Sultanate of Oman

OMSB Telephone Number
24499252 Ext. 117

OMSB Fax Number
24496802

OMSB Website
www.omsb.org

OMSB Email Address
biochemistry@omsb.org
omsb@omsb.org