



IRAQI BOARD OF MEDICAL SPECIALIZATIONS ADULT ENDOCRINOLOGY, DIABETES AND METABOLISM CURRICULUM



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1.1 FACILITIES FOR TRAINING

Training Institution

Name:	National Diabetes Center- Mustansiriyah University
Address:	Baghdad- AL-Yarmouk

Name:	Imamain Al-Kadhimain Medical City
Address:	Baghdad- AL-Kadhimya 60 Street

Training Institution

Name:	The Speicalized Center for Endcorinology and Diabetes SCED
Address:	Baghdad- Rasafa- Al-Nahdha

1.2 Introduction

This subspecialty training program in endocrinology, diabetes and metabolism is designed to provide advanced training and experience at a level for the trainee to acquire the knowledge, skills, attitudes and experience required for all of the competencies needed by a consultant in this field.

This program is designed to fulfill the needs of those trainees who anticipate their future activities to be solely the clinical practice of this specialty, those who expect to function as clinician-educators and those who intend to pursue careers in clinical and/or basic endocrine research. The program recognizes that some trainees may evolve into specialists whose activities encompass more than one of the above career paths. The teaching environment and educational experiences for trainees, detailed below, will equip them to become strong clinicians, educators, and investigators.

This document represents the minimum expected criteria. The aspiring clinical endocrinologist should aim to demonstrate knowledge and understanding of the physiology, epidemiology and pathology, appropriate patient consultation, diagnostic

techniques, treatment options and follow-up procedures for each of the endocrine disorders listed in the curriculum. An additional section highlights the key techniques required for routine endocrine clinical diagnosis. For each of these techniques the clinician should understand the theory, practical application and interpretation of the data obtained. They should be able to explain these techniques to the patient taking into account the patient's knowledge level and emotional condition.

Endocrinologists should not work in isolation. They should lead and build multidisciplinary teams in order to obtain the best outcome for patients. Such a team may include specialist surgeons or neurosurgeons, oncologists, radiotherapists, specialist nurses and other allied health professionals. A clinical endocrinologist able to demonstrate the above competency for each of the sections outlined in this curriculum should be confident of their ability to practice clinical endocrinology.

Paediatric endocrinology, as a separate specialty, is not considered within the scope of this document.

1.3 Goals for trainees and programs:

A. Patient Care

1. Acquire the technical and practical skills that are required by a consultant in endocrinology, diabetes and metabolism. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.
2. Acquire clinical skills in a progressive fashion and with increasing responsibility appropriate for a consultant in endocrinology, diabetes and metabolism. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.
3. Gain the knowledge and skills necessary for providing cost-effective, ethical and humanistic care of patients with diabetes and disorders of endocrinology and metabolism. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.

B. Medical Knowledge

1. Learn basic and advanced endocrine biochemistry, physiology and pathophysiology, which provide the basis for understanding diseases of the endocrine system (year 1).
2. Accumulate a critical mass of fundamental information and practical approaches for the diagnosis, management and prevention of endocrine disorders. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 will have the knowledge base expected for a practicing endocrinologist.

C. Communication and Interpersonal Skills

1. Acquire the skills needed to counsel patients with diabetes and other endocrine disorders, and to communicate effectively with patients with complex diseases, referring physicians and other health care professionals. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.

D. Professionalism

1. Gain the knowledge and skills necessary for providing cost-effective, ethical and humanistic care of patients with diabetes and disorders of endocrinology and metabolism. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.

E. Practice-Based Learning

1. Gain the knowledge and skills necessary for critical analysis of the laboratory testing and the endocrine literature. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.

2. Acquire skills in design and performance of hypothesis-driven endocrine research, and to participate in such research or equivalent scholarly activity. In year 1, the trainee will start acquiring these skills and begin participation in research. By the end of year 3, the trainee will have gained experience conducting, reporting and presenting research.

3. Provide an environment that fosters “a spirit of inquiry and scholarship” which will thereby instill a commitment to life-long learning.

F. Systems-Based Learning

1. Gain the knowledge and skills necessary for providing high quality, cost-effective, ethical and humanistic care of patients with diabetes and disorders of endocrinology and metabolism. The trainee will demonstrate increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice.

1.4 Objectives

A. Patient care.

The program will provide training in:

1. Diagnosis and management of endocrine diseases including:

- (a) History and physical examination with emphasis on examination of the fundi, thyroid and feet (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice) and breasts and male and female reproductive organs (year 3).
- (b) Selection and interpretation of endocrine biochemical tests (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).
- (c) Selection and interpretation of imaging procedures such as sonography, radionuclide scans, computerized axial tomography, magnetic resonance imaging, positron emission tomography, etc. (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice) .
- (e) Fine needle aspiration of the thyroid and interpretation of cytology and pathology (year 3).
- (f) Understanding pharmacotherapy for endocrine disorders and appropriate use of surgery, radiation therapy, treatment with radioisotopes, etc (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).

B. Medical Knowledge

The program will provide training in:

1. Endocrine biochemistry, genetics, developmental biology, physiology and pathophysiology (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).

2. Hormone action including signal transduction pathways as well as the biology of hormone receptors and feedback inter-relationships (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice)

3. Diagnosis and management of disorders in endocrinology, diabetes and metabolism (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).

4. Procedural and technical skills required by the endocrine subspecialist (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).

C. Professionalism

1. The program will provide training in professionalism, including peer interactions, communication with patients, their families and other health care providers, confidentiality and avoidance of conflict of interest (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).

D. Practice-Based Learning

1. The trainee will begin a clinical or basic research project in Endocrinology, Diabetes and Metabolism in year 1, and provide a written report and oral presentation of rationale and results by the end of year 3.

2. The program will provide training in the understanding of existing and emerging endocrine literature (increasing competency in year 1 and throughout year 3, such that by the end of year 3 the trainee will be prepared for independent practice).

3. The trainees will participate in chart audits for diabetes performance measures with review of results and monitoring of improvement (years 1 and 3).

4. Personal scholarship and self-instruction (increasing competency in year 1 and throughout year 3).

E. Systems-Based Learning

1. The program will provide training in the transition of diabetes care between the outpatient and inpatient settings (year 1).

2. The trainees will identify a quality improvement project (year 1) and complete the project (year 3).

1.5 Patient Care Experience

Trainees will be directly supervised and continually evaluated by attending physicians assigned to the inpatient and outpatient settings. Inpatients are reviewed on a daily basis with the attending physician. Attending physicians who are physically in the outpatient setting review the outpatient care experience of the trainee on a case by case and real time basis. The continuing interaction between trainee and attending physician is the heart of the educational experience. The integration of endocrine disorders with other diseases of the patient is part of the interaction between attending physician and trainee. When relevant, health promotion and identification of risk factors for disease are emphasized. All patient interactions take into account cultural, socioeconomic, ethical occupational, environmental and behavioral issues.

Our program provides a progressive learning experience. Trainees are given increasing responsibility as they progress through the program and demonstrate their expanding knowledge base and expertise in diagnosis and management of endocrine disease. They serve as leaders of the endocrine ‘team’, which is constituted by trainee, internal medicine residents and medical students, always under the supervision of the attending physician. Our program emphasizes a scholarly approach to diagnosis and management. Self-instruction is expected of the trainee along with critical analysis of the patient’s problems and appropriate decision analysis regarding further evaluation and/or management.

Professionalism and ethical behavior are hallmarks of this training program. Our faculty serves both as mentors and role model clinicians for the values of professionalism. These include placing the needs of the patient first, a commitment to scholarship, helping other colleagues, continuous quality improvement and humanistic behavior both in patient interactions and interactions with other health care providers. Issues concerning professional ethics and physician impairment are discussed as they relate to specific interactions with patients.

1.5.1 General Care

Outpatient services in Endocrinology, Diabetes and Metabolism are provided at the National Diabetes Center, Imamain Al-Kadhimain Medical city and the Specialized Center for Diabetes and Endocrinology in Rasafa. These outpatient facilities are the home of all adult and pediatric outpatient endocrine services and serves as the major referral center for all endocrine services in Baghdad.

These centers use a multi-disciplinary approach to the management of diabetes. The diabetes patient education program is a locally designed Program in the National Center of Diabetes and Iraqi Diabetes and Endocrinology Association (IDEA) recognized.

Comprehensive diabetes services are available. The team approach is emphasized using diabetes dietitian, a clinical adult endocrinologists, additional pediatric endocrinologists and availability of pediatric and adult psychologists, ophthalmologists, urologists, nephrologists, cardiologists, neurologists, surgeons and other subspecialties as needed.

The Rasafa Specialized center for Endocrinology and Diabetes site is also the home of interdisciplinary Thyroid Center (with Nuclear Medicine, Surgery and Pathology) and Metabolic Bone Disease Center (with Radiology and Orthopedic Surgery available in Kindy Hospital). There is a DEXA bone mineral density machine and two thyroid ultrasound machines at the center. The Diabetes and Endocrine clinics at the Department of the National Diabetes Center are an additional rich training experience for our fellows.

Inpatient consultations in Diabetes, Endocrinology and Metabolism are primarily at the University Hospital of Imamain Al-Kadhmain Medical City, Yarmouk Teaching Hospital and Al-Kindy Teaching Hospital.

1.5.2 Outpatient Care

Since most endocrine care is delivered in an outpatient setting, the outpatient experience is emphasized throughout the entire duration of the program.

Educational Purpose: To learn about a variety of diseases of endocrinology and metabolism, through consultation and provision of continuing care.

Teaching Methods: Outpatient care is both consultative and continuing. For each interaction, the trainee will spend sufficient time with the patient to carry out an appropriate history and physical examination and then to interact with and be directly supervised by the endocrine faculty assigned to that outpatient activity. The learning experience surrounding a patient interaction evolves from review of history, physical examination and laboratory results with the faculty, taking direction from the faculty and being provided with references or other learning materials that can be used for self-instruction and subsequent review with the faculty.

Disease Mix and Patient Characteristics: Patients are 16 years of age or older including adequate representation of geriatric patients. The distribution of ages and sex in our clinics approximates their distribution among the general population with endocrine disease. Trainees care for patients with a wide range of clinical problems in stages of illness appropriate to the outpatient setting.

A unique feature of our program is that our pediatric endocrinologists work side-by-side with our adult endocrinologists, sharing the same outpatient care facility (National Diabetes Center and Specialized Center of Endocrinology and Diabetes). This facilitates experience in pediatric endocrinology.

In addition to clinics in which the trainee encounters the broad range of endocrine pathology, other topics are routinely covered in meetings, discussions, journal club and other didactic sessions.

Procedures and Services: Dynamic endocrine studies and fine needle aspiration biopsy of the thyroid will be taught and performed by the trainees in the outpatient setting. Appropriate laboratory testing, including imaging, will be ordered and results reviewed

as part of the doctor/patient/attending interaction. Cytological and pathological material will be reviewed and analyzed when appropriate. Second year fellows attend the weekly ultrasound/FNA clinic, where they perform ultrasound guide FNA's under the direct supervision of our faculty in Al-Imamain Al-Kadhimain Medical City.

Reading Lists and Educational Resources: These are listed below in section three the curriculum. In addition, fellows are encouraged and expected to follow clinical endocrinology updates from the Endocrine Society and the AACE.

Evaluation: Evaluation and feedback is an ongoing process by virtue of the close mentoring relationship between fellows and the faculty in our program. Our division evaluates the six (6) competencies promoted by the Iraqi Board of Medical Specialization. These include: Patient Care, Medical Knowledge, Practice-Based Learning Improvements, Interpersonal and Communication Skills, Professionalism, and Systems-Based Learning. See section on evaluation, below.

Trainees follow their clinic/outpatient patients for the duration of the program. By means of the outpatient experience provided in this program, the trainee has the opportunity to observe and learn the course of endocrine diseases and their treatments.

1.5.3 In-patient Care

Since endocrine specialists are frequently required to consult on and manage endocrine aspects of care in hospitalized patients, the training program also emphasizes training in the inpatient setting.

Educational Purpose: To learn about a variety of diseases of endocrinology and metabolism as they occur in the hospitalized patient.

Teaching Methods: Hospital care is both consultative and continuing. For each interaction, the trainee will spend sufficient time with the patient to carry out an appropriate history and physical examination and then to interact with and be directly supervised by the endocrine faculty assigned to that activity. The learning experience surrounding a patient interaction evolves from review of history, physical examination and laboratory results with the faculty, taking direction from the faculty and being provided with references or other learning materials that can be used for self- instruction and subsequent review with the faculty. Consultation is frequently requested to determine the impact of endocrine disease on coexisting illnesses that necessitated hospitalization. The trainee will also learn, under supervision, how to interact not only with the patient and family, but also with other physicians caring for the patient.

Practice Setting: In-patient consultative service

Number of consults/week	The consult service follows, on average, 3-5 patients/day and receives 8-10 new consults/week
Number of fellows/team	3
Are students/residents included in the team	Yes
Average duration of rounds (hours)	3-4

Disease Mix and Patient Characteristics: On request, trainees provide consultation to the Internal Medicine service and other departments such as surgery, vascular surgery, obstetrics and gynecology, psychiatry, ophthalmology, neurosurgery, orthopedic surgery, etc. Patients will have a variety of diseases that impact on the endocrine system, diseases of other systems with coexisting endocrine disease, or manifestations of primary endocrine disease such as diabetes mellitus, thyroid or parathyroid disease that warrant hospitalization. Patients will be adults of all ages, including the geriatric age group and both sexes. Sex and age of patients will parallel their distribution among the variety of endocrine disease that occurs in hospitalized patients. The severity of illness will be much greater than in the outpatient setting.

Procedures and Services: Trainees will coordinate the evaluation and management of the endocrine aspects of the patient's illness. After interaction with the endocrine-attending physician, the trainee will order appropriate laboratory tests, biopsies, imaging and infusion studies, as dictated by the patient's problem. Data will be reviewed and treatment recommended.

Reading Lists and Educational Resources: These are listed in section three.

Evaluation:

Trainees evaluate patients by history, physical examination, and review of available laboratory and other data. The trainee is encouraged to formulate a differential diagnosis, plan for further evaluation and management. These are reviewed with faculty assigned to teaching rounds and faculty assigned in the outpatient setting. Learning occurs by an iterative process through continuing interaction with faculty, review of pertinent literature and further discussion as new data emerges or changes in the patient's condition occurs as a consequence of recommended treatment.

Experience in the inpatient setting will include preparation of appropriate patients with endocrine disease for surgery as well as postoperative management, radiation therapy and/or treatment with iodine-I-131. Interaction with professionals from other departments is reviewed and evaluated. In-patients who have surgery or biopsy, pathology and cytology are reviewed with appropriate specialists in those departments.

See section 1.8 on evaluation, below.

1.6 Facilities and Resources

The program has full-time secretarial support, which facilitates scheduling, arranging consultations, preparing meeting schedules and referrals. Fellows have office space that contains computer facilities that can be used for email and internet services, including literature searches. The faculty regularly receive a number of journals and books, all of which are available to the trainee. Trainees are encouraged to participate in local and national endocrine meetings. In general, each trainee attends one national meeting per year.

1.6.1 Teaching Site(s)

Primary outpatient site: National Diabetes Center, Specialized Center of Endocrinology and Diabetes

Additional outpatient site: Imamain Al-Kadhimai Medical City

Primary inpatient site: Imamain Al-Kadhimai Medical City

Additional inpatient site: Al-Yarmouk Teaching Hospital. Al-Kindy Teaching Hospital

1.6.2 Clinical Rotations

Fellows have 3 to 4 outpatient's clinics per week including one general endocrinology, one general diabetes, one specialized endocrinology and one specialized diabetes clinics.

Inpatient consultations are fellows during the week. The fellows share this responsibility on weekends (1 weekend/month/fellow).

1.6.3 Additional Facilities and Resources

Our hospital has modern facilities and services, including in-patient, outpatient care and laboratory resources and these are readily available to all trainees. In addition, complete biochemistry laboratories and hormone assays are available during the day hours. The specialized Endocrinology and Diabetes center in Rasafa has its own DEXA machine and our endocrine faculty train fellows on bone mineral density (BMD) interpretations. All three centers have ultrasound machines used for ultrasound-guided FNAs. Cytologic interpretation of thyroid aspirations are available on site and fellows review these specimens with the Department of Pathology staff in Al-Imamain Al-Kadhimain Medical city. The hospitals doesn't has facilities for karyotyping and these are referred to the Educational Labs in Baghdad Medical city. The Department of Radiology provides MRI, CT, ultrasound, and radiologic imaging services that can conduct studies for all types of endocrine diseases. Inferior petrosal sinus and adrenal vein sampling are not available in Iraq, but fellows are trained in interpretation of these tests as reports are brought by patients when done outside Iraq. The hospital supports a dietary/nutritional service. There is a fully staffed surgical pathology laboratory for the interpretation of surgical and cytologic specimens, including immunohistologic studies.

Nuclear Medicine center in Amal Oncology hospital provides all routine radionuclide imaging methods including radio-iodine thyroid scanning and ablation, parathyroid scanning. PET scan, MIBG and Ga Dotate are available in Private centers.

Core Meetings

Endocrinology, Diabetes and Metabolism Case Meetings

Educational Purpose: To discuss a variety of diseases of endocrinology and metabolism in greater depth than at the bedside or the outpatient care setting. Correlation with endocrine biochemistry, physiology and pathophysiology is expected.

Teaching Method: This weekly case meeting reviews the diagnosis, evaluation and management of disorders in Endocrinology, Diabetes and Metabolism over the course of the year. Guest speakers are periodically invited. A list of topics, speakers and participants is kept by the Program Director as well as the Office of Continuing Medical Education. The first Monday of each month is a multicenter meeting with cases from all centers are presented with attendance of supervising faculty. Faculty from Pathology/Cytology routinely review thyroid aspiration biopsies and when available, surgical pathological specimens. The second Thursday of the month is a general endocrinology (adult and pediatric) case meeting. The case meeting on the third Thursday of the month concentrates on disorders of mineral metabolism and metabolic bone diseases. The fourth Thursday of the month is the Diabetes; Metabolism and Lipid Disorders case meeting. Fellows routinely help plan and conduct these meetings. A fellow usually presents at least one case and reviews one relevant Journal article at each meeting.

Procedures and Services: Appropriate use of biochemical testing, imaging and biopsy as well as review of above studies, cytology and pathology are routinely incorporated in the meetings.

Reading Lists and Educational Resources: May be prepared for selected meetings. More detailed lists and resources are provided below in the sections on specific groups of endocrine diseases. Fellows are expected to refer to relevant current literature during their presentations.

Evaluation: Trainees who give meetings are evaluated by attending physicians (see teaching Evaluation Form). Their performance in this venue is also part of their overall evaluation by attending physicians and the program director. See section on evaluation, below.

Additional Clinical Meetings:

- 1) American Association of clinical endocrinology AACE -MENA
- 2) Endobridge Meeting .
- 3) Lebaense Endocrine Society Meeting LESDL.
- 4) AACE comprehensive course Endocrine Board Review.
- 5) ECE postgraduate review course.
- 6) EASD Meeting

Journal Club

Educational Purpose: To expose trainees, on a continuing basis, to critical reading of the emerging endocrine literature. Participation in Journal Club also provides instruction in clinical epidemiology, in biostatistics and in clinical decision theory.

Teaching Method: Trainees will be expected to present analyses of assigned papers in the current literature or of papers of their own selection. Their presentation will include analysis of experimental groups and design, methodology of measurements, and of statistical analysis. Others, including faculty, will interact with the trainee.

Disease Mix: Literature relating to all endocrine disease will be discussed during the training program.

Procedures and Services: As research concerning endocrine procedures or services is published, those papers may come under discussion in Journal Club.

Evaluation: Trainee's performance in this venue will be part of their evaluation by the faculty. In turn, trainees will evaluate faculty as facilitators of the Journal Club and as participants.

Journal Clubs are scheduled at 3-4 times/month at the primary training site.

Research Meetings

Educational Purpose: To acquaint trainees with the status of current research carried out by the faculty, other trainees, members of other Divisions within the Department of Medicine, or other Departments in the institution. Trainees will participate in the critique of the presentation and be exposed to the interactive discussions of the participants.

Teaching Method: Interactive discussion of presented research among experts on topics of basic and clinical science of endocrinology and metabolism, including experimental design, methodology, statistical analysis and interpretation of data. In addition, those fellows actively participating in either basic or clinical research will present their research project to the division at least annually.

Disease Mix: Research may be presented that relates to any and all endocrine disease.

Basic Science Meetings

Educational Purpose: To instruct trainees in the basic biochemistry, physiology and pathophysiology of the endocrine system. At a minimum, subject areas will include molecular biology and immunology as they relate to endocrinology and metabolism, signal transduction pathways, biology hormone receptors and principles of hormone action, biology of sexual development, reproductive endocrinology, endocrine aspects of sexual dysfunction, and feedback systems.

Teaching Methods: Monthly teaching sessions are led by Basic sciences faculty of Al-Mustansirya College of Medicine and Al-Nahrain College of Medicine. Trainees are given materials for self-instruction in the subject area of the Basic Science Meeting. The meeting is usually in a seminar format with as much interaction between trainees and faculty as possible.

Disease Mix: Not relevant.

Procedures and Services: Not relevant.

Evaluation: The faculty will evaluate trainee preparedness and interaction. In turn, trainees will evaluate the effectiveness of the faculty.

Basic Science Meetings are held on a monthly basis.

1.6.4 Procedures

Trainees will obtain a comprehensive understanding of indications, contraindications, limitations, techniques, complications and interpretations of procedures that are required for diagnosis and management of patients with disorders of endocrinology and metabolism. This understanding includes informing the patient about the above aspects of specific procedures and obtaining informed consent. Procedures will be taught and then supervised by faculty in various patient care settings, described above. Trainees will maintain logbooks that list each procedure and copies will be maintained in the program director's files. Each entry includes name of patients, identifying numbers, clinical problem, procedure, indication of complications, results of test. The program director will determine, on the basis of faculty input and analysis of logbook entries, when the trainee has achieved proficiency in a specific procedure. For fine needle aspiration biopsy of the thyroid, the supervising faculty will determine when the fellow is proficient or whether they require further training and experience.

The specific procedures that will be learned in this training program will be detailed in the disease-specific sections of this curriculum.

1.6.5 Other Competencies

Issues concerning quality assessment, quality improvement, risk management and cost-effectiveness are discussed in all clinical and laboratory settings throughout this program.

Each fellow is required to complete a quality improvement project which is approved and reviewed with the Program Director. A summary of this project is placed in each fellow's portfolio.

Similarly, ethics and professionalism are considered in all patient interactions. Ethics issues are also discussed in case meetings.

Additional training experiences are encouraged in clinical pathology. For those trainees who may, in future activities, direct a clinical laboratory, twenty hours of supervised training in the indications, performance, and evaluation of results of endocrine testing are suggested.

Patient education, counseling and end-of-life care will be taught by example when appropriate in specific interactions with patients and their families. Other issues that concern palliative care for terminally ill patients are discussed when appropriate.

1.7 Research and Other Scholarly Activities

Trainees in this program are expected to carry out research and participate in other scholarly activity. During the first year, trainees are expected to learn about the research interests of the faculty members, by attending Research Seminars, Journal Clubs, or by direct interaction initiated by the faculty, trainee or program director. In general, trainees should reach an agreement to carry out research with a specific faculty member by the beginning of the second year of the program. This allows the trainee to learn the literature concerning the research area and begin, by repeated interaction with the faculty mentor, to formulate an experimental design. Thus, within 6-9 months, the trainee is ready to move into the research arena without delay. In our program, the allotment of time dedicated to research varies over the course of a training year as well as between years of training. In general, the annualized percentage effort for research is:

Year 2	40-60%
Year 3	100%

The research experience in our training program is based on a mentor: trainee relationship that is meaningful, interactive at frequent intervals, and that leads to formulation of the research problem, determination of appropriate experimental design, use of appropriate research methodology, analysis of data, interpretation of results and, eventually, publication in peer-reviewed journals. In our program, almost all trainees publish in peer-reviewed journals and present their work at national endocrine meetings. During their first year, fellows are taught clinical research design and methodology, ethical conducts of research, and laboratory techniques of molecular and cellular biology and interpretation of data (basic science and research meetings. In Journal Club, they learn to analyze scientific literature critically.

In addition to basic and clinical research, trainees will present at Clinical Meetings, Journal Club, and, Research Seminars. They are encouraged to write up and publish interesting cases that they encounter during their training. Finally, faculty is encouraged to ask trainees to participate in writing of invited Chapters or Reviews, with appropriate authorship designation.

1.8 Evaluation

Evaluation in this program is an ongoing process and occurs in a 360° manner. During clinical rotations, the attending of the month is the principal evaluator of the trainee. Trainees are evaluated in all aspects of clinical activities and patient care, including attributes of professionalism.

Evaluation forms developed by the Iraqi Board of Internal Medicine are employed for this evaluation and the attending and trainee are expected to discuss the evaluation before the end of the post. Trainees are required to keep their own record of procedures, indicating who supervised the procedure and copies of the procedure logbook or equivalent documents are provided to the program director for the trainee's file annually. Clinical evaluations are conducted by supervising attendings and research mentors. 360-degree evaluations are also performed by hospital staff including nurse educators and dietitians. Attendings also evaluate meeting presentations (forms attached). Consultants complete the mini CEX with each fellow twice a year. At semiannual intervals, the program director will prepare a written summary of the evaluations for each trainee and those will be discussed in person with the trainee.

At annual intervals, a summary evaluation will be prepared by the program director, documenting the degree to which the trainee has mastered each component of clinical competence. Trainees will be advanced to a position of greater responsibility after they have demonstrated satisfactory scholarship and professional growth. A written policy of to ensure due process has been developed by the Department of Medicine and is used by all Subspecialty Divisions in our institution.

A formal, written primary examination is administered by the end of the first year to help determine the trainee's base of factual knowledge and ability to make decisions concerning patient care.

Two additional Examination are performed by the end of the third year of training. A 2 paper case scenarios written examination. Once the candidate achieves the passing mark a final clinical examination is done. The clinical examination consists of 4 parts, 1 long case, 2 short cases, viva oral examination and 20 slides. The candidate is expected to achieve at least 70/100 in all parts in order to be deemed successful in all the parts of the final examination. If the candidate fail to achieve the passing mark a further training is required and re-evaluation will be done after 6 months.

Counseling and Remediation: In the unlikely event that a trainee requires remediation in one or more areas that impact on clinical competence, the program director will appoint an ad hoc committee of faculty to develop a plan of remediation, implement the plan and evaluate the trainee's response. If a faculty member receives poor evaluations as an attending physician, those evaluations and plans for improving performance will be discussed in a meeting with the program director.

The research evaluation is performed by the end of the third year and the fellow is expected to defend his thesis against the assessment committee.

Evaluation Summary

General Competencies	Teaching	Evaluation Tools
Patient Care	Direct supervision of patient care in outpatient and inpatient settings	Faculty evaluation Mini CEX
Medical Knowledge	Clinical settings (during 1:1 supervision in outpatient setting and Rounds on inpatient consultation service) Meetings, lectures, Journal Clubs Directed readings	Faculty Evaluation MiniCEX Annual In-Training exams Evaluations of presentations at meetings
Interpersonal and Communication Skills	Didactic teaching sessions Feedback during supervision of clinical encounters Meetings	Faculty Evaluations MiniCEX 360 Evaluation
Professionalism	Ethics Courses and Conflict of Interest Instruction Meetings	Faculty Evaluation 360 Evaluation
Practice Based Learning	Team Meetings with staff and Program Director Journal Club Chart audits for diabetes patient charts/quarter for adherence to performance measures	Faculty Evaluations Review of Chart Audits by Program Director
Systems Based Learning	Faculty member mentors fellow in an area that needs improvement and fellow describes plans/suggestions for improvements in these areas (i.e. improved format/ algorithms for insulin orders in the hospital). Each fellow provides a description of these activities for their portfolio which is reviewed by the Program Director. Meetings and Lectures	Program Director review of quality improvement project Faculty evaluations

Section 2

Curriculum Spectrum

In line with the European Society of Endocrinology Curriculum

- 2.1. Type 1 diabetes
- 2.2. Type 2 diabetes
- 2.3. Other specific types of diabetes
 - 2.3.1. Latent autoimmune diabetes in adults (LADA)
 - 2.3.2. Maturity onset diabetes of the young (MODY)
 - 2.3.3. Maternally inherited Diabetes and Deafness (MIDD)
 - 2.3.4. Other genetic defects and syndromes associated with diabetes
 - 2.3.5. New onset diabetes mellitus after transplantation
 - 2.3.6. Diseases of the exocrine pancreas
 - 2.3.7. Malnutrition-related diabetes mellitus
 - 2.3.8. Drug-associated diabetes
 - 2.3.8.1. Corticosteroid-induced diabetes
- 2.4. Gestational diabetes
- 2.5. Pre-diabetes
 - 2.6. Age-related conditions and diabetes
 - 2.6.1. Young people
 - 2.6.2. Elderly people
 - 2.7. Diabetic emergencies
 - 2.7.1. Diabetic ketoacidosis
 - 2.7.2. Hyperosmolar hyperglycaemic state
 - 2.7.3. Hypoglycaemia
- 2.8. Management of patients with diabetes during acute illness or surgery
- 2.9. Conception and pregnancy in diabetes
- 2.10. Complications of diabetes
 - 2.10.1. Screening for the complications of diabetes
 - 2.10.2. Cardiovascular macrovascular complications
 - 2.10.3. Eye disease
 - 2.10.4. Renal disease and hypertension
 - 2.10.5. Neuropathy and erectile dysfunction
 - 2.10.6. Autonomic neurological complications
 - 2.10.7. Foot disease
 - 2.10.8. Lipid disease
 - 2.10.9. Hypoglycaemia unawareness
- 2.11. Nutrition and metabolic support
- 2.12. Diabetes technology
 - 2.12.1. Insulin pumps

- 2.12.2. Continuous glucose monitoring
 - 2.12.3. Flash glucose monitoring
- 2.13. Diabetes and driving
- 3. Lipid disorders
 - 3.1. Advanced lipoprotein testing
 - 3.2. Genetic lipid disorders
 - 3.3. Disorders of high-density lipoprotein cholesterol
 - 3.4. Atherogenic dyslipidemia (of insulin resistance and diabetes mellitus)
 - 3.5. Hyperlipidemia in solid-organ transplantation
 - 3.6. Lipodystrophy syndromes
 - 3.7. Serum lipid disorders in patients with HIV
- 4. Obesity and bariatric endocrinology
 - 4.1. Diet, psychobehavioural and medical approach
 - 4.2. Bariatric surgery
 - 4.2.1. Physiological and metabolic effects of bariatric surgery
 - 4.2.2. Complications of bariatric surgery
 - 4.3. Hereditary causes
- 5. Pituitary
 - 5.1. Hyperfunction of pituitary gland
 - 5.1.1. Hyperprolactinemia
 - 5.1.2. Acromegaly and gigantism
 - 5.1.3. Cushing's syndrome
 - 5.1.3.1. Cushing's disease
 - 5.1.3.1.1. Nelson's syndrome
 - 5.1.3.2. ACTH-independent CS
 - 5.1.3.3. Ectopic ACTH syndrome
 - 5.1.3.4. Pseudo-Cushing's syndrome
 - 5.1.4. Thyrotropinoma
 - 5.1.5. Gonadotropinoma
 - 5.2. Hypopituitarism
 - 5.2.1. Anterior pituitary deficiency
 - 5.2.2. Posterior pituitary deficiency
 - 5.2.3. Hypothalamic dysfunction
 - 5.2.4. Pituitary dysfunction in systemic disorders
 - 5.3. Pituitary tumours
 - 5.3.1. Incidentaloma
 - 5.3.2. Pituitary adenoma
 - 5.3.3. Inherited forms of pituitary adenoma
 - 5.3.4. Craniopharyngioma
 - 5.3.5. Rathke's cleft cyst
 - 5.3.6. Empty sella syndrome

- 5.3.7. Pituitary carcinoma
- 5.3.8. Pituitary apoplexy
- 5.3.9. Infiltrative Pituitary disorders
- 5.3.10. Non-pituitary sellar masses
- 5.3.11. Indications and complications of pituitary surgery
- 5.3.12. Indications and complications of radiotherapy
- 5.4. Pituitary disorders during pregnancy
- 6. Thyroid
 - 6.1. Thyrotoxicosis
 - 6.1.1. Graves-Basedow
 - 6.1.1.1. Graves' orbitopathy
 - 6.1.2. Toxic adenoma
 - 6.1.3. Toxic multinodular goitre
 - 6.1.4. Other causes
 - 6.1.4.1. Hyperthyroidism factitia
 - 6.1.4.2. Amiodarone induced thyrotoxicosis
 - 6.1.4.3. Ectopic thyroid tissue
 - 6.2. Hypothyroidism
 - 6.2.1. Autoimmune hypothyroidism
 - 6.2.2. Congenital hypothyroidism
 - 6.3. Thyroid emergencies
 - 6.3.1. Thyroid crisis or storm
 - 6.3.2. Myxoedema coma
 - 6.4. Thyroiditis
 - 6.4.1. Subacute thyroiditis
 - 6.4.2. Autoimmune thyroiditis
 - 6.4.3. Riedel's thyroiditis
 - 6.4.4. Acute Bacterial thyroiditis
 - 6.5. Thyroid neoplasms
 - 6.5.1. Incidentaloma
 - 6.5.2. Follicular adenoma
 - 6.5.3. Thyroid carcinoma
 - 6.5.3.1. Well-differentiated
 - 6.5.3.1.1. Papillary
 - 6.5.3.1.2. Follicular
 - 6.5.3.2. Medullary
 - 6.5.3.3. Anaplastic
 - 6.5.4. Goitre
 - 6.5.4.1. Diffuse goitre
 - 6.5.4.2. Nodular and multinodular goitre
 - 6.6. Thyroid hormone resistance
 - 6.7. Non-thyroidal illness syndrome

- 6.8. Thyroid disease in pregnancy
 - 6.8.1. Postpartum thyroiditis
- 6.9. Disorders of iodine-deficiency
- 7. Parathyroid, calcium and bone
 - 7.1. Hyperparathyroidism and other disorders of parathyroid gland
 - 7.1.1. Primary hyperparathyroidism
 - 7.1.2. Familial hypocalciuric hypercalcemia
 - 7.1.3. Secondary hyperparathyroidism
 - 7.1.4. Tertiary hyperparathyroidism
 - 7.1.5. Parathyroid carcinoma
 - 7.1.6. Other inherited forms
 - 7.2. Hypoparathyroidism
 - 7.2.1. Idiopathic hypoparathyroidism
 - 7.2.2. Post-surgical hypoparathyroidism
 - 7.2.3. Pseudohypoparathyroidism
 - 7.2.3.1. Pseudopseudohypoparathyroidism
 - 7.2.4. Other inherited forms
 - 7.3. Vitamin D deficiency
 - 7.4. Osteoporosis
 - 7.4.1. Postmenopausal osteoporosis
 - 7.4.2. Osteoporosis in men
 - 7.4.3. Secondary osteoporosis
 - 7.5. Measurement of bone mass and fracture risk assessment
 - 7.5.1. Tools for fracture risk assessment
 - 7.5.2. Bone imaging and structure parameters
 - 7.5.3. Biochemical markers of bone turnover
 - 6.5.4. Dual-energy X-ray Absorptiometry
 - 7.6. Bone and mineral disorders
 - 7.6.1. Other causes of hyper- and hypo-calcaemica
 - 7.6.2. Hypophosphatemia
 - 7.6.3. Rickets and osteomalacia
 - 7.6.4. X-linked hyperphosphaturic hypophosphatemia
 - 7.6.5. Hypophosphatasia
 - 7.6.6. Osteogenesis imperfecta
 - 7.6.7. Paget's disease of bone
 - 7.6.8. Fibrous dysplasia
 - 7.6.9. High bone mass disorders
- 8. Adrenal
 - 8.1. Primary adrenal insufficiency
 - 8.1.1. Addison's disease
 - 8.1.2. Mineralocorticoid deficiency

- 8.1.3. Other causes of adrenal deficiency
- 8.2. Adrenocortical hyperfunction
 - 8.2.1. Primary aldosteronism
 - 8.2.2. Glucocorticoid remediable aldosteronism
 - 8.2.3. Apparent mineralocorticoid excess syndrome
 - 8.2.4. Liddle's syndrome
 - 8.2.5. Cushing's syndrome
- 8.3. Congenital adrenal hyperplasia
- 8.4. Adrenal tumours
 - 8.4.1. Adrenal incidentaloma
 - 8.4.2. Adrenal hyperplasia
 - 8.4.3. Adrenal adenoma
 - 8.4.4. Adrenocortical carcinoma
 - 8.4.5. Pheochromocytoma and paraganglioma
 - 8.4.5.1. Hereditary forms
- 9. Reproductive endocrinology and sexual function
- 9.1. Hypogonadotropic hypogonadism
 - 9.1.1. Inherited
 - 9.1.1.1. Kallman's syndrome
 - 9.1.2. Acquired
- 9.2. Growth and development
- 9.3. Puberty
 - 9.3.1. Delayed puberty
 - 9.3.2. Precocious puberty
- 9.4. Polycystic ovary syndrome
- 9.5. Hormonal Contraception
- 9.6. Menopause
 - 9.6.1. Premature ovarian failure
 - 9.6.2. Ovarian hyperthecosis
- 9.7. Primary ovarian failure
 - 9.7.1. Turner's syndrome
- 9.8. Ovarian tumours
- 9.9. Testicular dysfunction
 - 9.9.1. Klinefelter syndrome
 - 9.9.2. Other chromosomal aberrations
 - 9.9.3. Sertoli cell only syndrome
- 9.10. Testicular tumours
- 9.11. Erectile dysfunction
- 9.12. Gynaecomastia
- 9.13. Management of the infertile couple
 - 9.13.1. Ovulation induction
 - 9.13.2. Induction of spermatogenesis

- 9.13.3. Assisted reproduction
- 9.14. Disorders of sexual development
- 9.15. Gender dysphoria
 - 9.15.1. Male-to-Female
 - 9.15.2. Female-To-Male
- 10. Electrolytes and fluid balance
 - 10.1. Hyponatremia
 - 10.1.1. Syndrome of inappropriate secretion of antidiuretic hormone
 - 10.1.2. Other causes
 - 10.2. Polydipsia
 - 10.3. Hypokalaemia
 - 10.4. Hypomagnesemia
- 11. Neuroendocrine tumours
 - 11.1. Thymus and mediastinal carcinoid tumours
 - 11.2. Pulmonary neuroendocrine tumours
 - 11.3. Small intestinal neuroendocrine neoplasms
 - 11.4. Pancreatic neuroendocrine neoplasms
 - 11.4.1. Insulinomas
 - 11.5. Appendiceal carcinoids
 - 11.6. Other neuroendocrine tumours (Breast, Ovary)
 - 11.7. Functional neuroendocrine tumours
 - 11.7.1. Insulinoma
 - 11.7.2. Gastrinoma
 - 11.7.3. Glucagonoma
 - 11.7.4. Ectopic ACTH syndrome
 - 11.8. Carcinoid syndrome
- 12. Inherited endocrine tumour syndromes
 - 12.1. Multiple endocrine neoplasia
 - 12.1.1. MEN1
 - 12.1.2. MEN2 (Formerly MEN2a)
 - 12.1.3. MEN3 (Formerly MEN2b)
 - 12.1.4. MEN4
 - 12.2. von Hippel-Lindau disease
 - 12.3. Familial paraganglioma syndromes
 - 12.4. Neurofibromatosis type 1
 - 12.5. Tuberous sclerosis
 - 12.6. Carney complex
- 13. Polyendocrine syndromes
 - 13.1. APS 1
 - 13.2. APS 2

14. Treatment-induced endocrine dysfunction
 - 14.1. Interferon
 - 14.2. Checkpoint-inhibitors
 - 14.3. Tyrosine kinase inhibitors
 - 14.4. Lithium
 - 14.5. Late effects in long term paediatric cancer survivors
15. Hormone Abuse
 - 15.1. Testosterone and anabolic steroids
 - 15.2. Peptide hormones
16. Endocrine-disrupting chemicals
 - 16.1. Characteristics
 - 16.2. Mechanism of action
 - 16.3. Endocrine effects
17. Diagnostic techniques in endocrinology
 - 17.1. Assessment of hormones and pitfalls of laboratory testing
 - 17.1.1. RIA
 - 17.1.2. ELISA
 - 17.1.3. LC-MS/MS
 - 17.1.4. Point-of-care testing
 - 17.2. Dynamic endocrine function testing
 - 17.3. Conventional Imaging
 - 17.3.1. Ultrasound
 - 17.3.1.1. Thyroid including fine needle aspiration and cytology
 - 17.3.1.2. Pancreatic endoscopic ultrasound
 - 17.3.1.3. Ovarian and testicular
 - 17.3.2. CT
 - 17.3.3. MRI
 - 17.4. Functional Imaging
 - 17.4.1. Technetium, Iodine scintigraphy
 - 17.4.2. Technetium Sestamibi scintigraphy, SPECT/CT
 - 17.4.3. MIBG scintigraphy
 - 17.4.4. Somatostatin receptor scintigraphy
 - 17.4.5. PET, PET/CT and PET/MRI
 - 17.4.5.1. ¹⁸F-FDG
 - 17.4.5.2. ⁶⁸Ga-DOTATATE
 - 17.4.5.3. ¹¹C-methionine/¹⁸F-choline
 - 17.4.6. Bone scintigraphy
 - 17.5. Angiographic techniques and localisation with venous sampling
 - 17.5.1. Bilateral inferior petrosal sinus sampling for ACTH
 - 17.5.2. Bilateral adrenal venous sampling for aldosterone

- 17.5.3. Intra-arterial calcium stimulation with hepatic venous sampling for functioning insulinomas and gastrinomas 17.5.4. Parathyroid venous sampling

Section 3

Reading Material and Resources

Textbooks

1. Oxford Handbook of Endocrinology and Diabetes
2. Williams Textbook of Endocrinology
3. Greenspan's Basic and Clinical Endocrinology

Journals

1. Clinical Endocrinology
2. Journal of Clinical Endocrinology and Metabolism
3. European Journal of Endocrinology
4. Diabetes Care
5. Lancet
6. New England Journal of Medicine

Guidelines

1. American Thyroid Association (ATA) Guidelines
2. Endocrine Society Clinical Practice Guidelines
3. American Diabetes Association/ European association for the study of Diabetes
4. AACE guidelines

Conferences

1. Endobridge conference
2. AACE -MENA
3. Society for Endocrinology - Clinical Update Meeting
4. European Society of Endocrinology (ECE)
5. European Association for the Study of Diabetes (EASD)
6. Endocrine Society
7. American Diabetes Association (ADA)

Online Resources

1. UpToDate

Board Review Courses and Self-assessment material

1. CEU by Endocrine society
2. European Post Graduate Course
3. Endocrine Self Assessment Program ESAP
4. Endocrine Board Review EBR
5. Meet the Professor Series MTP
6. Best of Five MCQs for the endocrinology and diabetes SCE, OHST

7. StudyPRN Endocrinology and Diabetes website
8. OnExamination Endocrinology and Diabetes website