



الهيئة السعودية للتخصصات الصحية  
Saudi Commission for Health Specialties

# Saudi Adult Endocrinology and Metabolism Fellowship Curriculum



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# CONTRIBUTORS

## Curriculum Development Committee:

- Dr. Suphia M Sherbeeni
- Dr. Maiasa Alqurashi

## Reviewed and Approved by Specialty's Scientific Members:

- Dr. Abdulraof Almahfouz
- Dr. Suphia M Sherbeeni
- Dr. Faiza Qari
- Dr. Khalid Aljabri
- Dr. Tariq Nasser
- Dr. Maiasa Alqurashi
- Dr. Atallah Alruhaily
- Dr. Mussa AlMalki
- Dr. Rashid Omar Aljawair
- Dr. Mussa AlMalki
- Dr. Mohammed Aldowish
- Dr. Aysha alkzami
- Dr. Moaber Mahzari

## Advisory Committee Members:

- Dr. Sami Al-Ayad
- Dr. Zubair Amin

## Contributors of the previous edition:

- Prof. Riad Al Sulimani
- Dr. Salih Al Jasser
- Dr. Essa Al Dhafiri
- Dr. Abdulraof Almahfouz
- Dr. Suphia M Sherbeeni
- Dr. Faiza Qari

## Curriculum Review Committee Members:

- Dr. Lubna Alkadi, BDS, MSc, MME, Dip Pros, FRCDC
- Dr. Sakra S. Balhareth, Pharm.D., BCPS, BCACP
- Dr. Mazen Alqasmi, MBBS, Msc.MedEd, SBEM
- Dr. Nada Saleh, Msc.MedEd, MSc, PhD
- Dr. Ali AlShehri, MBBS, Msc.MedEd. FRCSC, FACS

## Approved by Head of Curriculum Review Committee:

- Dr. Ali Alassiri, MBBS, Msc.MedEd. FRCSC, FACS



---

## II. COPYRIGHT AND AMENDMENTS

---

©2015 Saudi Commission for Health Specialties. All rights reserved. This material may not be reproduced, displayed, modified, or distributed without written permission from the copyright holder. No other use is permitted without prior written permission from the Saudi Commission for Health Specialties. For permission, contact the Saudi Commission for Health Specialties, Riyadh, Kingdom of Saudi Arabia. Any amendment to this document must be approved by the Specialty Scientific Council and the Executive Council of the Commission. Amendments shall be considered effective from the date on which the revised electronic version is published on the commission's website, unless a different implementation date has been agreed upon.

Correspondence: Saudi Commission for Health Specialties P.O. Box: 94656 Postal Code: 11614 Contact Center: 920019393

E-mail: [systemadmin@scfhs.org](mailto:systemadmin@scfhs.org)

---

# FOREWORD

---

The Saudi Commission of Health Specialties is committed to ensuring the best care of patients and good clinical practice through evidence-based, high-quality medical education and training.

The concept of “competencies and outcomes” has come to be increasingly used over the past decade, and has been adopted by health authorities in several countries. Competency-based models for medical education were first promoted for wide use by McGaghie and colleagues as part of a report to the World Health Organization in 1978. In that report, the authors defined competency-based medical education (CBME) in terms of the following goal: *“the intended output of a competency-based programme is a health professional who can practice medicine at a defined level of proficiency, in accord with local conditions, to meet local needs.”*

## Reasons for adopting the CanMEDS framework

Competency-based training is training designed to allow the trainee to demonstrate the ability to do a task, activity, or unit of work well enough to be assessed as competent based mostly on learning outcome/output assessment, and this is provided by the CanMEDS framework.

Taking into consideration the learner’s needs, community needs, and the requirements of the CanMEDS framework, the trainee graduates not only as a medical expert but also with skills in communication, collaboration, leadership, health advocacy, commitment to lifelong learning and high degree of proficiency.

## Purpose of the curriculum

The purpose of this curriculum is to define the process of training and the competencies needed for the award of a certificate of Fellowship in Adult Endocrinology and Metabolism and to achieve consistency in training across institutes and guarantee minimum requirements to graduate fully competent consultant endocrinologists who can serve patients’ and society’s needs. It is also intended to



encourage equality of learning experience and opportunity to all trainees. It is intended for reference use, to guide trainee and trainer through the training program.

It should be reviewed periodically for quality improvement based on new scientific developments, emerging issues, and auditing of the curriculum's effectiveness and training results.

## Acknowledgments

First and foremost, praises and thanks to God, the Almighty, for his many blessings and guidance, and for endowing us with the knowledge to complete this work.

The completion of this document would not have been possible without the expertise of Dr. Sami Al-Ayad and Dr. Zubair Amin, members of the advisory committee who helped us patiently, unstintingly, and unconditionally in the journey of developing this curriculum.

A debt of gratitude is also owed to the members of the first scientific committee, who developed the first curriculum in 2009, setting the stage for this curriculum and the members of the second scientific committee, who developed the first draft of this version in 2018. we would also like to acknowledge that the CanMEDS framework is a copyright of the Royal College of Physicians and Surgeons of Canada, and many of the descriptions and adult endocrinology competencies have been acquired from their resources.

---

# IV. TABLE OF CONTENTS

---

CONTRIBUTORS	3
II. COPYRIGHT AND AMENDMENTS	5
Foreword	6
Reasons for adopting the CanMEDS framework	6
Purpose of the curriculum	6
Acknowledgments	7
IV. Table of Contents	8
Introduction	10
1. Context of Practice	10
2. Goal and Responsibility of curriculum implementation	12
3. What is new in this edition?	12
Abbreviations used in this document	14
IVII. Program Entry Requirements	16
VIII. Learning and Competencies	17
1. Introduction to Learning Outcomes and Competency-Based Education	17
1. Structure of the training program	18
2. Program Durations	19
3. Program Rotations	19
4. Mapping of learning objectives and competency roles to program rotations:	22
IX. Continuum of Learning	49
X. Teaching Methods:	51
1. PROGRAM SPECIFIC LEARNING ACTIVITIES:	53
2. UNIVERSAL TOPICS	65
3. GENERAL LEARNING OPPORTUNITIES:	66
XI. ASSESSMENT AND EVALUATION	70
1. Purpose of Assessment	70
2. Formative Assessment (Continuous Assessment)	71
3. Summative Assessment	73
XII. Program and Courses Evaluation	77
XIII. Policies and Procedures	78
XIV. Appendices	79
Appendix A	79





Appendix B	81
Appendix C	82
Module 1: Introduction	82
Module 2: Diabetes and Metabolic Disorders	82
Module 3: Medical and Surgical Emergencies	83
Module 4: Acute Care	83
Module 5: Frail Elderly	85
Module 6: Ethics and Healthcare	86
Appendix D	87
Appendix-E	91
Interpretational and procedural Logbook	92
Appendix-E	93
Appendix F	94
Appendix-G	95
Glossary	95
Appendix-G	96
References	97



---

# INTRODUCTION

---

## 1. Context of Practice

The Saudi population is increasing exponentially, currently to more than 31 million with an annual growth rate of 1.49% and a fertility rate of 2.17%; life expectancy has also improved consistently over the last 60 years, to 74.82 years. Currently, more than 69% of the population is aged 15 to 64 years.<sup>1, 2</sup>

Non-communicable diseases (NCDs) are becoming increasingly prevalent, and more than 60% of the global mortality rate is attributed to non-communicable diseases<sup>3</sup>. The demands of care for NCDs are a threat to economic growth and development. Most endocrine and metabolic disorders are non-communicable diseases. One of them, diabetes, is one of the four top NCDs in the world.<sup>4</sup>

Endocrine and metabolic disorders such as diabetes, obesity, dyslipidemia, osteoporosis, thyroid disorders, and metabolic bone diseases are common in the Saudi population, with diabetes affecting more than 23% of adult Saudis<sup>5, 6, 7</sup>. Around 30 % of the population suffering from obesity<sup>8</sup>, more than 20 % having dyslipidemia<sup>9, 10</sup>, and more than 40 % of Saudi women above the age of 45 years having osteoporosis.<sup>11, 12</sup>

Thyroid cancer is the second-most-common malignancy among females<sup>13</sup>. Furthermore, approximately 10.5% of inpatient admission is due to diabetes mellitus.

Healthcare in Saudi Arabia is provided by number of agencies; these can be broadly divided into government and private agencies. Public care administered by the national Ministry of Health (MOH) covers 60% of the population, 20% are covered by other government health agencies (universities, the Ministry of Defense, ministry of national guards, the Ministry of the Interior, Saudi Aramco (the national oil and gas company), and the Royal Commission for (the cities of Jubail and Yanbu) and 20% are covered by private health agencies.<sup>14</sup>

The total number of hospitals in Saudi Arabia is 452, and there are 2281 primary healthcare centers; working in these facilities are more the 81,000 physicians and



more than 12,000 dentists. Twelve of these hospitals are accredited to provide adult endocrinology fellowships.<sup>15</sup>

The need for well-trained adult endocrinologists to meet the increasing demand in Saudi society has been recognized for more than thirty years, since the establishment of hospital-affiliated fellowship programs in the early 1980s at King Faisal Specialist Hospital & Research center and King Khalid University Hospital, both in Riyadh and both of which have graduated a number of adult endocrinologists serving in Saudi Arabia and other Gulf countries.

The birth of the first Fellowship in Adult Endocrinology, Diabetes and Metabolism under the umbrella of the Saudi Commission for Health Specialties was in 2007, by the effort of a group of consultants from different hospitals run by universities, MOH, Ministry of National Guard and Defense.

Endocrinology and metabolism is a subspecialty of internal medicine concerned with the study of the diseases of the endocrine organs and metabolism and with disorders of hormone systems and related organs. The practice involves the assessment, diagnosis, and treatment of patients with diabetes, hypoglycemia, disorders of pituitary, thyroid, and parathyroid, adrenal glands, lipid disorders, obesity, calcium and bone diseases, diseases of growth and puberty, reproductive endocrinopathy, endocrine and neuroendocrine tumors, disorders of sex differentiation, endocrine disorders in pregnancy, and endocrine changes in critically ill patients, in systemic diseases, and in childhood cancer survival.

This specialty also encompasses the use of hormonal assays for the diagnosis and monitoring of therapy.

Endocrinology, diabetes, and metabolism fellowship provides advanced, broad-based clinical and academic education and training to allow a physician to acquire competency in the subspecialty in terms of knowledge, skills, and attitudes, with sufficient expertise to act as an independent consultant. Endocrinology and metabolism is an intellectually challenging specialty, with ample opportunities to engage in research, teaching, and patients care.

Several countries have adopted the CanMEDS framework in their postgraduate training programs for outcomes-oriented medical education, to assess the trainee in seven domains: as Medical Expert, Communicator, Collaborator, Health Advocate,

Manager, and Professional. The Saudi Fellowship in Adult Endocrinology and Metabolism meets the requirements of basic core training for SCHS and follows the CanMEDS frameworks.

## 2. Goal and Responsibility of curriculum implementation

The ultimate goal of this curriculum is to guide trainees to become *competent* in their specialty. This goal will require significant amount of efforts and coordination from all stakeholders involved in postgraduate training. As an “*adult-learner*” trainees have to demonstrate full engagement with *proactive* role by: careful understanding of learning objectives, self-directed learning, problem solving, openness and readiness to to apply what they have learned by reflective practice from feedback and formative assessment, and self-wellbeing and seeking support when needed. Program director has a vital role to make the implementation of this curriculum most successful. Training committee members, and particularly program administrator and chief resident, have significant impact on the program implementation. Trainees should be enabled to share the responsibility in curriculum implementation. Saudi Commission for Health Specialties (SCFHS) will apply the best models of training governance to achieve the best quality of training. Academic affairs in training centers and regional supervisory training committee will have major role in training supervision and implementation. The Adult Endocrine scientific *committee* will be responsible to make sure that the content of this curriculum is constantly updated to match the best-known standards in postgraduate education of their specialty.

## 3. What is new in this edition?

This version of the Adult Endocrinology and Metabolism Training Program Curriculum follows the competency-based framework adopted by the Saudi Commission for Health Specialties.

In addition, the following changes have been included in this version:

All rotations of the training program, as well as educational activities, are described in a competency-based format. All the objectives are aligned with the CanMEDS framework. Specifically, the competencies in question are: adult endocrinology expert, communicator, collaborator, manager, health advocate, scholar, and professional.



This means that the range of competencies has been expanded to include a balanced representation of knowledge, skills, and attitude. Changes have been made to the timeframe of rotations.

A list of the most important clinical topics and procedures in adult endocrinology, as well as universal topics, has been added.

Core Specialty Topics are described in detail, particularly in the areas of knowledge & skills.

A Suggested list of Workshops/simulation/didactic and interactive sessions is included.

The methods of assessment have been updated. Expected competencies for each stage of the training are clearly defined.

In the evaluation process, a higher emphasis is placed on continuous assessment and balanced assessment methods, and a logbook designed to support learning and individualized assessment is included.

Promotion along with the end-of-year exam and final examination have been revised according to the new examination rules and regulations by the Saudi Commission.

Evaluation forms and procedural logbook forms for each rotation have been added.

# ABBREVIATIONS USED IN THIS DOCUMENT

Abbreviation	Description
CBD	Case-Based Discussion report
CBL	Clinic-Based Learning
CBE	Competency-Based Education
CER	Continuous Evaluation Report
COT	Consultation Observation Tool
DOPS	Direct Observation of Procedural Skills report
F(1)	(First) year of Fellowship
F(2)	(Second) year of Fellowship
FITER	Final In-Training Evaluation Report
ITER	In-Training Evaluation Report
Mini-CEX	Mini-Clinical Experience report
MCQ	Multiple Choice Question
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
SDL	Self-Directed Learning
SCFHS	Saudi Commission for Health Specialties



Abbreviation	Description
ACTH	Adrenocorticotrophic Hormone
ADH	Antidiuretic Hormone
AVS	Adrenal Venous Sampling
BIPSS	Bilateral Inferior Petrosal Sinus Sampling
BMD	Bone Mineral Density
CAH	Congenital adrenal Hyperplasia
CGMS	Continuous Glucose Monitoring System
CRH/CRF	Corticotropin Releasing Hormone/Factor
CT-scan	Computerized Tomography-scan
DDAVP	Desmopressin (1-deamino-8-D-arginine vasopressin)
DKA	Diabetic Ketoacidosis
DXA	Dual-energy X-ray absorptiometry
FNA	Fine Needle Aspiration
FRAX	Fracture Risk Assessment Tool
GDM	Gestational Diabetes Mellitus
GH	Growth Hormone
GHRH	Growth Hormone Releasing hormone
GnRH	Gonadotrophin Releasing Hormone
hCG	Human Chorionic Gonadotropin
HHS	Hyperglycemic Hyperosmolar State
IVGTT	Intravenous Glucose Tolerance Test
MODY	Maturity Onset Diabetes of Youth
MRI	Magnetic Resonance Imaging
OGTT	Oral Glucose Tolerance Test
PTH	Parathyroid Hormone
PTHrP	PTH-related protein
RAI	Radio-active Iodine
TRH	Thyroid Releasing Hormone
TSH	Thyroid Stimulating Hormone
US	Ultrasound

---

# VII. PROGRAM ENTRY REQUIREMENTS

---

- Please refer to the updated executive policy of SCFHS on admission and registration.
- Adult Endocrinology specific admission requirement as defined by scientific council/committee:
  - Recognized Medical Degree Certificate in internal Medicine from the Saudi Commission for Health Specialties
  - Licensure to practice medicine in KSA
  - Passing the admission examination/ Interview held by the Saudi Commission for Health Specialties/Fellowship scientific committee
  - Letter of sponsorship from the primary employer for the whole period of training (training is full time)
  - Three letters of recommendation from previous supervisors, preferably from the field of endocrinology.
  - Curriculum vitae
  - Valid identification





---

# VIII. LEARNING AND COMPETENCIES

---

## 1. Introduction to Learning Outcomes and Competency-Based Education

Training should be guided by well-defined “*learning objectives*” that are driven by targeted “*learning outcomes*” of a particular program to serve specific specialty needs. Learning outcomes are supposed to reflect the professional “*competencies*” and tasks that are aimed to be “*entrusted*” by trainees upon graduation. This will ensure that graduates will meet the expected demands of the healthcare system and patient care in relation to their particular specialty. *Competency-based education* (CBE) is an approach of “*adult-learning*” that is based on achieving *pre-defined, fine-grained, and well-paced* learning objectives that are driven from complex professional competencies.

Professional competencies related to healthcare are usually complex and contain a mixture of multiple learning domains (knowledge, skills, and attitude). CBE is expected to change the traditional way of postgraduate education. For instance, time of training, though is a precious resource, should not be looked to as a proxy for *competence* (e.g. time of rotation in certain hospital areas is not the primary marker of competence achievement). Furthermore, CBE emphasizes the critical role of informed judgment of learner’s competency progress, which is based on a staged and formative assessment that is driven from multiple workplace-based observations. Several CBE models have been developed for postgraduate education in healthcare (example: CanMEDs by the Royal College of Physician and Surgeon of Canada (RCPSC), the CBME-Competency model by the Accreditation Council for Graduate Medical Education(ACGME), tomorrow’s doctor in UK and multiple others). The following are concepts to enhance the implementation of CBE in this curriculum:

- **Competency:** Competency is a cognitive construct assessing the potential to perform efficiently in a given situation based on the standard of the profession. Professional roles (e.g. expert, advocate, communicator, leader, scholar, collaborator, and professional) are used to define competency-role in order to make it mendable for learning and assessment.
- **Milestones:** Milestones are stages along the developmental journey throughout competency continuum. Trainees throughout their learning journey, from junior and throughout senior levels, will be assisted to transform from being (novice/supervised) into (master/unsupervised) practitioners. This should not undermine the role of supervisory/regulatory bodies toward malpractice of independent practitioners. Milestones is expected to enhance learning process by pacing the training/assessment to match the developmental level of trainees (junior vs. senior).
- **Learning-Domains:** Whenever possible, efforts should be directed to annotate the learning outcomes with the corresponding domain (K=Knowledge, S=Skills, and A=Attitude). You might have more than one annotation for a given learning outcome.
- **Content-area Categorization:** It is advisable to categorize the learning outcomes in broad content area related to the practice of profession. For example, diagnostic versus therapeutic, simple versus complex, urgent versus chronic, etc.

This curriculum applies principles of competency –based medical education. CanMeds represents globally accepted framework outlining competency roles. “CanMeds 2015 framework” has been adopted in this section.

This reference is an example for the general outline of the CanMED competency (Frank JR, Snell L, Sherbino J, editors. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015)

## 1. Structure of the training program

### GENERAL TRAINING REQUIREMENTS

#### Requirements for admission:

- Refer to the updated policy and procedure of the SCFHS

#### General training requirements

- Trainees shall abide by the training regulations and obligations set by the SCFHS.
- Training is a full-time commitment. Fellows will be enrolled in full-time, continuous training for the program’s duration.



- Training is to be conducted in institutions accredited for training in adult endocrinology.
- The training will comprehensively cover specialties related to adult endocrinology.
- Trainees should be actively involved in patient care, with a gradual progression of responsibility.

## 2. Program Durations

Adult endocrinology and metabolism fellowship is a two-year, hands-on joint training program between accredited hospitals.

Please refer to the updated decree released by the Executive Council of Training and Education.

## 3. Program Rotations

The trainee is given the learning opportunity to develop clinical, academic, and research experience, by working in:

1. Patient care
  - a. Inpatients
    - i. Admissions
      1. Acute care cases
      2. Endocrine workup cases
    - ii. Consultations
  - b. Ambulatory care
    - i. Clinic
    - ii. Emergency department
2. Procedural skills
3. Didactic training and teaching opportunities
4. Research opportunities

### 1. Mandatory core rotations:

1. General endocrinology
2. General diabetes
3. Diabetes in pregnancy
4. Obesity and lipid
5. Pediatric and adolescent endocrinology, including diabetes, obesity, lipids, and transition of care to adulthood
6. Reproductive endocrinology
7. Laboratory (hormones, histopathology, and cytology)
8. Radiology (ultrasound, MRI, CT scan, nuclear medicine)

### 2. Electives

One month elective rotation is intended to cover those areas not covered sufficiently by the core rotation or where the fellow has a special interest in that area and needs



to gain more experience (e.g., advanced research experience, advanced knowledge and skill in management of neuroendocrine tumors, advanced endocrine radiology, etc.). Elective rotation should be done in the same training center or locally if resources unavailable to the fellow.

### 3. Selective options

- Pituitary
- Thyroid cancer
- Neuroendocrine tumors
- Insulin pump and CGMS

### 4. **outside rotation:** Rotation outside the primary training center

1. Three months should/could be done in another training center but in the same training region.
2. Other local or international rotation if resources available to the fellow are allow and the request will be granted under the following circumstances:
  - a. The fellow's performance has been satisfactory in all aspects.
  - b. The hospital in which the elective will be taken covers a specialty accredited by the Saudi Commission for Health Specialties or equivalent organization.
  - c. The local training committee must agree that such rotation will contribute substantially to the fellow's training and should be approved by scientific committee.

### Suggested requirements for each year

#### First year:

The first year of fellowship is devoted predominantly to clinical training to build the foundation for the Medical Expert and other roles. Fellows spend 12 months simultaneously participating in ambulatory patient care, which involves a mixture of clinics, and undergoing inpatient training:

1. Nine months' training in clinical endocrinology and metabolism
2. One month's rotation in pediatric endocrinology
3. One month's training in reproductive endocrinology/pituitary ± neurosurgery
4. One month's vacation
5. The candidate should start at least a research project in the second half of the first year

#### Second year:

The second year is structured to further develop the skills of a clinical endocrine consultant but also those of an educator, involving the learner more in supervising and training the other fellows, residents, interns, medical students, and other healthcare professionals, as well as involvement with patients and in public education. In addition, fellows conduct a mentored scholarly research project with the goal of abstract presentation and subsequent publication, perform a quality improvement project, and actively engage in didactic activities targeted at all levels of medical training. The second year involves more exposure to and refinement of clinical, technical, and didactic skills, including additional neck ultrasound, insulin pump, and continuous glucose monitoring training:

6. Eight months' training in general endocrinology
7. One month's training in radiology/laboratory (2 weeks each), in addition the trainee should attend 2-3 general endocrine clinics and all scheduled academic activities
8. One-month elective rotation
9. One month selective
10. One-month vacation

**Mandatory core rotation:** Set of rotations that represent program core component and are mandatory to do.

**Elective rotation:** Set of rotations that are related to the specialty, as determined by the scientific council/committee, and the trainee is required to do some of them.

Level	General endocrinology	Selective	Pediatric endocrinology	Reproductive endocrinology	Radiology /laboratory	Elective	vacation	Total
F1	9	0	1	1	0	0	1	12
F2	8	1	0	0	1	1	1	12

**Selective rotation:** Set of other rotations that is selected by trainee (directed by mentor/program director) to enhance competency acquisition of the specialty)

## 4. Mapping of learning objectives and competency roles to program rotations:

Core specialty topics (Knowledge, Skills & Attitude)

Diabetes (general)

### Knowledge

1. Describe the anatomy and histology of the pancreas and the islet of Langerhans
2. Describe the structure of insulin, insulin receptors, insulin mechanism of action at the cellular level, and other hormones related to diabetes
3. Describe the epidemiology (global and national), diagnostic criteria and classification, etiology, types, and pathogenesis of diabetes mellitus
4. Describe the epidemiology, pathophysiology, clinical presentation, screening, and treatment and prevention of microvascular and macrovascular complications of diabetes
5. Describe various insulin-resistance syndromes
6. Elaborate on diabetes and pregnancy, maternal and fetal outcome, management, preconception counseling and planning, management during pregnancy, intralabor and postpartum, risk to offspring, update in definition of gestational diabetes, update in the diagnostic criteria of GDM, its management, and prevention of diabetes after delivery
7. Demonstrate an awareness of new developments in the prevention and treatment of diabetes
8. Apply the principles of lifestyle management, including knowledge of nutrition (including carbohydrate counting and healthy living), into patient management
9. Describe the pharmacological management of both type 1 and type 2 diabetes
10. Describe the systems used to monitor blood glucose, including continuous glucose monitoring systems
11. Describe the use of technology in diabetes such as diabetes databases and the use of meter/pump downloads
12. Describe the principles of structured education in the management of diabetes
13. Describe appropriate strategies for the prevention and detection of diabetes mellitus



14. Describe appropriate preventive strategies/treatments for micro- and macrovascular complications of diabetes

15. Describe evidence-based therapeutic targets

### Skills

1. Perform a focused medical interview and physical examination of a person with diabetes
2. Counsel a patient effectively on the basic principles of diabetes mellitus self-care including importance of glycemic control, with particular emphasis on the prevention of diabetes complications
3. Explain the basic principles and role in management of diabetes of a medical nutritional therapy including carbohydrate counting and food with low glycemic index and low glycemic load; understand how dietary modification affects glycemic control
4. Interpret home blood glucose readings and adjust insulin and hypoglycemic therapy appropriately based on their results
5. Manage a patient with diabetic ketoacidosis, hyperosmolar coma or severe hypoglycemia, during sick days, prolonged exercise or fasting, and perioperatively
6. Select cost-effective laboratory tests to effectively assess glycemic control, risk factors and screening for microvascular complications
7. Outline appropriate treatment strategies for acute and chronic complications in a person with diabetes
8. Effectively counsel and manage an adolescent with poor metabolic control
9. Manage patients in special circumstances, such as fasting at Ramadan and performing the Hajj.

### Attitude

1. Collaborate effectively with the multidisciplinary team
2. Appreciate the impact of diabetes on patients, their families, and society
3. Recognize that diabetes is a disease requiring self-care and education, and accept and encourage the role of the patient and family in decision-making and goal-setting
4. Appreciate the different needs and beliefs of patients
5. Recognize the impact of patients' and families' own health beliefs and support systems

## Diabetic emergencies

### Knowledge

1. Diagnose and distinguish types of diabetic hyperglycemic emergency: DKA and HHS
2. The underlying pathogenesis of metabolic decompensation and its management
3. Diagnose, categorize severity and etiology, and establish plan for management and prevention of hypoglycemia, including self-management
4. Identify patients lacking knowledge about hypoglycemia and its management, including adjustment of medications and indication of insulin pump

### Skills

1. Identify and differentiate between different hyperglycemic emergencies
2. Demonstrate skills in taking accurate and focused history from patients with DKA, HHS, or hypoglycemia: identify the predisposing factors
3. Perform physical examination focusing on hemodynamic and respiratory status and level of consciousness—indications of ICU admission
4. Formulate appropriate plan for investigation and management
5. Educate patients and family about future prevention of such episodes

### Attitude

1. Recognize and judge the urgency and severity of the emergency
2. Recognize that management and prevention of diabetes emergencies are interdisciplinary team tasks and need collaboration with other healthcare professionals such as diabetes educators and dietitians, as well as family members
3. Recognize the impact of hypoglycemia unawareness on the lifestyle of patients, their families, and their caregiver.
4. Recognize the impact of recurrent DKA on patients' family life and health
5. Recognize the importance of motivating patients to self-management

## Management of patients with diabetes during acute illness, hospitalization, or surgery

### Knowledge

1. Describe the pathophysiology of glycemic decompensation in acute illness, surgery, and hospitalization
2. Describe the impact of acute illness and stress of hospitalization and surgery on glycemia and the impact of hyperglycemia on these situations





3. Describe the impact of other concomitant treatments such as steroids or parenteral nutrition on glycemia
4. Describe the metabolic requirements of patients with diabetes during surgery and acute illness
5. Describe the implications of glucose control during hospitalization

### Skills

1. Adjust therapy in the short term to manage glucose control during acute illness
2. Manage diabetes appropriately in patients on steroids or parenteral nutrition
3. Manage diabetes appropriately in perioperative patients
4. Be able to supervise and advise other healthcare professionals in the management of patients with diabetes under their care

### Attitude

1. Recognize the importance of multidisciplinary teamwork
2. Recognize the need for specialist diabetes care in different clinical environments
3. Recognize the importance of glucose control in patients who are acutely unwell
4. Respect the differences in expertise and limitations among healthcare professionals

## Diabetes in young people

### Knowledge

1. Describe types of diabetes other than type 1 autoimmune in children and adolescents: type 2, MODY, secondary diabetes, diabetes associated with heredity disorders
2. Describe the effects of diabetes on normal growth and development in children
3. Describe the physiological changes of puberty and the impact of puberty hormones on glycemic control
4. Describe the impact of psychological and social factors on glycemic control in adolescence
5. Describe insulin regimen used in childhood and adolescence
6. Describe use of oral agents and other diabetes medication in childhood and adolescence
7. Describe use of insulin pumps and CGMS in childhood and adolescence
8. Describe beta cell and stem cell transplantation and guidelines to patients and their parents
9. Describe the rights of children and young people

## Skills

1. Perform medical interviews of young persons with diabetes, including detailed history of hypoglycemia, hyperglycemia, DKA, predisposing factors, and presence of other autoimmune disorders
2. Analyze SBMG logbook/CGMS in the context of insulin regimen; show ability to adjust regimen
3. Provide care to young persons with diabetes in transition to adult care
4. Screen for microangiopathy during puberty
5. Recognize common risk behavior in young persons and its effects on diabetes
6. Sensitively identify depression in young patients with diabetes and refer appropriately

## Attitude

1. Exhibit a non-judgmental attitude to young patients with diabetes
2. Demonstrate preparedness to change behavior in response to feedback and reflection
3. Respond to the physiological, psychological, and social problems involved in maintaining glycemic control in adolescence and to the concerns and anxieties of parents/carers
4. Adopt a patient-focused approach that acknowledges that the patient's values may not be shared by the trainee

## Diabetes in elderly people

### Knowledge

1. Describe endocrine and metabolic changes in the elderly
2. Describe the potential effects of comorbidities associated with aging on diabetes treatments and control
3. Describe the effects of aging and associated disability on access to healthcare
4. Describe the impact of psychosocial factors on diabetes management in the elderly
5. Describe the diversity of agencies and healthcare workers that can support elderly patients living in the community
6. Describe the pharmacodynamics and pharmacokinetics of diabetes drugs in the elderly and the impact on their use

### Skills

1. Assessment of fragile elderly persons
2. Adapt therapeutic targets and diabetes treatment regimens to the individual patient taking account of comorbidities
3. Manage the specific social and medical needs of elderly patients with diabetes in the community
4. Advise about the care of older people in residential and nursing care, taking into account appropriate utilization of health services and resources
5. Assess and advise so as to minimize risk especially for elderly, vulnerable patients

### Attitude

1. Adopt a patient-centered approach recognizing that diabetes management and



therapeutic targets may need adjustment in elderly patients with disability, social isolation, and/or comorbidity

2. Adopt a team approach in coordinating, in some cases leading but always acknowledging the efforts of other organizations and individuals managing older patients with diabetes

## Conception and pregnancy in diabetes

### Knowledge

1. Discuss the importance of glucose control in pre-conception and during pregnancy and the need for family planning in fertile women of all ages
2. Describe physiologic endocrine changes and glucose homeostasis during pregnancy
3. Describe the effect of pregnancy on diabetes management and glycemia
4. Describe the effect of diabetes on the pregnant woman and her fetus, and strategies for prevention
5. Describe the risk of diabetic complications on pregnant woman and fetus
6. Describe the risk factors for gestational diabetes and current diagnostic criteria and appropriate screening strategies
7. Describe the different available methods of contraception
8. Describe screening guidelines for diabetic complications before planning pregnancy and during pregnancy.

### Skills

1. Discuss the interaction of diabetes and pregnancy and the need for family planning in fertile women of all ages
2. Advise women about the importance of pre-conception care and potential risks of diabetic pregnancy, including progression of complications
3. Advise women with diabetes regarding contraception

4. Set up glycemic control targets during pregnancy and share the decision-making with the patient
5. Optimize glycemic and blood pressure control prior to and throughout pregnancy
6. Recognize the importance of an interdisciplinary approach in management of diabetic women in childbearing age
7. Diagnose and manage gestational diabetes
8. Deliver antenatal diabetes care in the setting of a joint obstetric clinic
9. Manage glycemia during labor and delivery
10. Implement strategies for reclassification of diabetes after delivery in women with gestational diabetes
11. Implement strategies for prevention of type 2 diabetes and monitoring in women with gestational diabetes
12. Use insulin pumps and CGMS in pregnancy

#### Attitude

1. Exhibit a non-judgmental attitude to women who have difficulty achieving glycemic targets prior to conception or during pregnancy and support their efforts to do so
2. Communicate and work with obstetricians, midwives, dietitians, and diabetes educators in the joint management of diabetic pregnancy

### Complications of diabetes—screening

#### Knowledge

1. Describe the pathogenesis of chronic diabetes complications
2. Apply updated guidelines for screening and prevention of diabetes complications

#### Skills

1. Apply evidence-base strategies for screening, prevention, and management of diabetic complications

#### Attitude

1. Recognize the criteria for urgent referral to appropriate services when diabetic complications are identified
2. Recognize the need for patients with diabetic complications to continuous psychosocial support

### Macrovascular disease

#### Knowledge

1. Recognize the importance of hyperglycemia as a risk factor for macroangiopathy



2. Describe other risk factors for macroangiopathy, including smoking, dyslipidemia, and hypertension
3. Describe the presenting features of cerebrovascular, cardiovascular, and peripheral vascular disease
4. Describe the available treatments for non-glycemic risk factors for macroangiopathy

### Skills

1. Identify and manage glycemia and other modifiable risk factors for macroangiopathy
2. Diagnose and manage heart failure in diabetes
3. Investigate and manage diabetic patients with established macrovascular disease
4. Recognize when to refer patients for specialist investigation and treatment (e.g., cardiology, vascular surgery)

### Attitude

1. Appreciate the impact of presence of diabetic complications on quality of life and be supportive to patients

## Diabetic eye diseases

### Knowledge

1. Describe effect of diabetes on different parts of the eye
2. Describe pathogenesis and different stages of diabetic retinopathy, and guidelines for visual acuity testing and retinal screening in diabetic patients
3. Describe the available treatments for eye complications
4. Describe the implications of eye complications on driving/employment
5. Describe recommendations for retinal screening, including in children, adolescents, and pregnant women

### Skills

1. Diagnose cataracts and all grades of severity of retinopathy using direct ophthalmoscopy
2. Use fundus photography and interpret retinal photographs to identify those who need referral to ophthalmology
3. Identify other ocular disorders associated with diabetes
4. Perform and interpret visual acuity testing
5. Optimize glycemic control and blood pressure in patients with diabetic eye disease

6. Recognize the types of diabetic eye complications which need urgent ophthalmology referral

#### Attitude

1. Appreciate the importance of primary prevention of diabetic eye disease
1. Recognize the importance of retinal screening and contribute to local diabetic retinopathy screening program
2. Recognize the impact of diabetes eye complications on patient's life including driving, work etc.

### Diabetic nephropathy

#### Knowledge

1. Describe pathogenesis and different stages of diabetic nephropathy
2. Describe guidelines in treatment of blood pressure and dyslipidemia in patients with diabetes and nephropathy
3. Describe the available tests for diagnosing nephropathy and explain the importance of screening for early nephropathy for early intervention to prevent progression
4. Describe the treatments available for diabetic nephropathy and hypertension
5. Describe contraindications and dose adjustment of diabetes drugs in nephropathy

#### Skills

1. Manage hypertension and dyslipidemia in nephropathy according to current guidelines
2. Set up glycemic control target in patients with renal impairment and manage accordingly
3. Screen, diagnose, and manage diabetic nephropathy and distinguish among its different stages
4. Evaluate other macrovascular risk factors in patients with diabetic nephropathy
5. Advise/counsel patients about the significance of nephropathy and its prevention
6. Communicate with colleagues in nephrology services and refer patients appropriately
7. Manage diabetes in post-renal transplant patients
8. Manage diabetic patients on dialysis

#### Attitude

1. Recognize the significance of a diagnosis of nephropathy for patients and support them



2. Recognize the implications of a diagnosis of diabetic nephropathy on patients, their care giver, and families

## Neuropathy and erectile dysfunction in diabetes

### Knowledge

1. Describe pathogenesis and different manifestations of diabetic neuropathy, including autonomic neuropathy
2. Describe role of neuropathy in the development of
3. Describe effect of diabetic gastroparesis on management of glycemia

### Skills

1. Perform medical interview identifying the presence or absence of the different patterns of autonomic and somatic polyneuropathy and mononeuropathies
2. Perform appropriate physical examination to identify diabetic neuropathy
3. Manage the neuropathies, including neurogenic pain and the manifestations of autonomic neuropathy
4. Appropriately utilize neurophysiology tests in diagnosing neuropathy
5. Conduct appropriate referral to other specialties, such as pain management, when needed
6. Evaluate and manage erectile dysfunction in diabetic men
7. Educate patient on prevention of consequences of polyneuropathy such as foot ulcer and postural hypotension

### Attitude

1. Appreciate the impact of neuropathy on patients' quality of life
2. Exhibit appropriate approach when discussing erectile dysfunction and communicating range of treatment options

## Diabetic foot disease

### Knowledge

1. Describe pathogenesis and range of diabetic foot diseases
2. Describe importance of foot examination (as diabetes quality indicator) in diabetic patients, including guidelines
3. Describe knowledge for prevention of amputation of lower extremities
4. Describe range of investigations to detect vascular insufficiency and neuropathy
5. Describe the role of different radiologic imaging techniques used in diagnosing osteomyelitis and Charcot foot

6. Describe appropriate antibiotic regimens used in treating foot infection, including local and national guidelines

### Skills

1. Identify patients at risk of foot problems and advise on prevention, recognizing the importance of patient education
2. Recognize when to refer patients for specialist foot care and understand use of footwear, orthotic appliances, and off-loading technique
3. Recognize the features of Charcot's neuroarthropathy, particularly acute Charcot amenable to medical treatment
4. Assess vascular supply and neurological status of the lower limbs
5. Use appropriate imaging techniques in detection and management of bone infection in the diabetic foot
6. Manage established diabetic foot problems including use of appropriate antibiotic treatment, liaising appropriately with infectious disease specialty
7. Exercise appropriate and timely judgment in the need for surgical referral
8. Recognize potential for cross-infection in clinical settings

### Attitude

1. Recognize the importance of the multidisciplinary team, including podiatrist, vascular and orthopedic surgeons, in the prevention and management of diabetic foot problems
2. Engage in local infection control procedures and practice aseptic technique whenever relevant
3. Recognize the impact of amputation on patients and their care giver and the importance of effective rehabilitation

## Insulin pump and CGMS

### Knowledge

1. Describe the principle of insulin pump therapy, types of insulin pump, CGMS, and artificial pancreas
2. Describe indications and requirements for successful insulin pump therapy
3. Describe pump failure

### Skills

1. Demonstrate skills in technical issues related to insulin pumps and sensor/CGMS
2. Train patients and their relatives on insulin pumps and CGMS
3. Appropriately prescribe insulin pump therapy





4. Work with educators, dietitians, the patient, and their family to optimize glycemic control and to motivate and re-motivate patients and families
5. Demonstrate skills in reading and interpreting the pump and sensor downloads and utilizing the data in optimizing glycemic control

#### Attitude

1. Recognize the impact of insulin therapy on patients' life and respect their choices and support them

### Hypoglycemia in non-diabetic patients

#### Knowledge

1. Explain normal glucose metabolism in the fed and fasting states, including glycolysis, gluconeogenesis, glycogenesis, and glycogenolysis
2. Understand the interactions between glucose, protein, and fat metabolism in the body
3. Understand the interplay between insulin, hormones of other islet cells, adrenals, and GIT in the control of blood glucose
4. Define hypoglycemia
5. Understand the different etiologies of hypoglycemia
6. Describe an effective approach to the diagnosis and management of hypoglycemia
7. Describe workup tests used to confirm and diagnose causes of hypoglycemia
8. Describe radiological imaging and other intervention used in localizing insulinoma
9. Describe the pharmacological treatment of hypoglycemia
10. Describe the medical management of inoperable islet cell tumors

#### Skills

1. Perform a focused history and examination in a patient referred for hypoglycemia
2. Select and interpret critical blood samples in the diagnosis of hypoglycemia
3. Show proficiency in performing a 72-hour fasting protocol
4. Effectively manage a patient with hypoglycemia

#### Attitude

1. Recognize the concerns of patients with hypoglycemia and their families with respect to the investigation and treatment of hypoglycemia and the risk of neurologic consequences

## Hypothalamic/pituitary/pineal disorders

### Knowledge

1. Show knowledge of the general anatomy, histology, and embryology of the hypothalamus and pituitary and pineal glands
2. Understand the roles of various genes involved in pituitary–hypothalamic development and how mutations in these impact normal hormone synthesis and release
3. Describe in detail the relevant control mechanisms and physiology, including target organ response for the anterior pituitary hormones and the feedback mechanism
4. Describe the etiology, clinical presentation, differential diagnosis, investigation, and management of hypopituitarism with particular emphasis on acquired conditions
5. Discuss water and electrolyte homeostasis, including the role of thirst, antidiuretic hormones, the renin-angiotensin system, and plasma volume and tonicity. Outline the etiology, clinical presentation, differential diagnosis, investigation, and management of SIADH and diabetes insipidus (central and nephrogenic)
6. Discuss pituitary tumors by describing their histology, clinical presentation, differential diagnosis, investigation, and specific treatment modalities, including success rates; include functional and non-functional adenomas
7. Show in-depth knowledge of the pharmacological agents used in the treatment of these disorders.

### Skills

1. Perform a focused history and examination in a patient referred for possible disorders of the pituitary gland, including growth failure, delayed or precocious puberty, hypopituitarism, hypogonadism, acromegaly, Cushing disease, hyperprolactinemia, diabetes insipidus, SIADH, and brain tumor, and particularly involving the hypothalamus/pituitary, incidental pituitary lesion, or empty sella
2. Perform and interpret basal and dynamic tests of pituitary function
3. Interpret common investigation tools, including blood tests of basal pituitary function, stimulatory and suppressive tests of pituitary function, and water deprivation tests
4. Select appropriate imaging modalities and recognize features consistent with congenital hypopituitarism, empty sella syndrome, pituitary adenomas, and craniopharyngioma



5. Show proficiency in managing patients with pituitary apoplexy, hypopituitarism, and hormonal excess
6. Demonstrate an ability to diagnose and provide first-line management of functioning and non-functioning pituitary tumors
7. Demonstrate an ability to diagnose and monitor optic nerve compression
8. Provide immediate and long-term care to patients with mass effects from pituitary enlargement
9. Demonstrate ability to diagnose and manage hypopituitarism
10. Demonstrate ability to diagnose and manage diabetes insipidus
11. Demonstrate ability to manage patients during and after surgery for pituitary tumors
12. Demonstrate ability to diagnose and manage patients with SIADH, thirst dysregulation, and other disorders of water balance

### Attitude

1. Recognize the long-term effects of pituitary disease, including changes in physical appearance, fertility, lifelong use of HRT, and the necessity of therapeutic compliance
2. Recognize the need for appropriate referrals for pituitary surgery and radiotherapy
3. Recognize the role of the multidisciplinary team in the management of pituitary tumors
4. Recognize the need for urgent referral of patients presenting with symptoms of optic nerve compression
5. Recognize the impact of hypothalamic/pituitary disorders on patients and carers

### Growth disorders

#### Knowledge

1. Discuss approaches to short stature and stunted growth, including growth hormone deficiency epidemiology, pathophysiology, etiology, investigation, and management
2. Describe the pharmacologic agents used in the treatment of such disorders, such as recombinant growth hormones, including approved and un-approved indications and abuses

#### Skills

1. Demonstrate the ability to perform an appropriate history and physical examination of a patient referred for short stature or aberrant growth.

2. Select and interpret appropriate investigations of a patient with short stature or other growth disorders, including dynamic test protocols and their sensitivity, specificity, and reproducibility
3. Show ability to use, read, and interpret growth charts in relation to our population
4. Show ability to use, read, and interpret disease-specific growth charts such as for Turner syndrome, Noonan syndrome, achondroplasia, Down syndrome, Marfan syndrome, etc.

#### Attitude

1. Recognize the potential psychosocial impact of growth disorders on patients.

### Gonad and sexual development and fertility

#### Knowledge

1. Explain the anatomy, histology and embryology of the ovaries and testes
2. Describe the etiology, clinical presentation, differential diagnosis, investigation, and management of ambiguous genitalia
3. Describe causes of primary and secondary gonadal failure and menstrual irregularity
4. Describe causes of male and female infertility, particularly endocrine causes
5. Describe the clinical manifestations, differential diagnosis, investigation, and management of precocious puberty, delayed puberty, incomplete puberty, menstrual disorders, infertility, and hyperandrogenic states in females and estrogenization in males
6. Discuss cytogenetic, molecular genetics, etiology, clinical manifestation, and management of disorders of sexual differentiation
7. Describe treatment strategies for gonadal failure, hirsutism, virilism, gynecomastia, polycystic ovarian syndrome, and infertility
8. Describe interdisciplinary approaches to the management of these disorders

#### Skills

1. Perform a focused history and physical examination in a patient referred for suspected disorders of sex differentiation
2. Select and perform tests of the hypothalamic-pituitary-gonadal axis
3. Interpret basal and stimulatory tests used in the diagnosis of these disorders, including gonadal dysgenesis, androgen insensitivity, premature thelarche, premature adrenarche, hypogonadotropic hypogonadism, hirsutism, amenorrhea, and gynecomastia
4. Show ability to investigate and manage primary and secondary gonadal failure



5. Appropriately prescribe sex hormone replacement therapy to men and women
6. Assess, investigate, and manage women with hirsutism/virilism
7. Assess, investigate, and manage women with menstrual disturbance
8. Manage polycystic ovarian syndrome
9. Show ability to investigate and manage men with gynecomastia
10. Show ability to provide first-line assessment and management to an infertile couple
11. Show ability to investigate and manage common chromosomal disorders such as Turner and Klinefelter syndromes

#### Attitude

1. Recognize the psychosocial impact on and the concerns of parents of patients with disorders of sex differentiation with respect to diagnosis and management
2. Recognize the impact on disorders of puberty, especially related to investigation and management
3. Understand ethical issues related to disorders in sex differentiation in relation to Saudi culture and Islamic religion
4. Recognize the importance of interdisciplinary care
5. Recognize the impact of infertility on the patient and their family
6. Adopt a non-judgmental approach to patients with gender dysphoria

#### Adrenal glands disorders

##### Knowledge

1. Explain the anatomy, histology, and embryology of the adrenal cortex and medulla
2. Discuss the biosynthesis, transport, and peripheral actions via receptors and control of secretion of adrenocortical hormones
3. Discuss how these hormones impact fluid, electrolyte, and acid–base disorders
4. Describe the etiology, clinical presentation, differential diagnosis, investigation, and management of primary and secondary adrenal insufficiency
5. Describe the clinical manifestations, differential diagnosis, investigation, and management of congenital adrenal hyperplasia, hyperandrogenism, Cushing syndrome, hypoaldosteronism, hyperaldosteronism, pheochromocytoma, and adrenal masses
6. Describe approaches to cases of adrenal incidentaloma and their management
7. Outline the etiology and investigation of endocrine causes of hypertension
8. Describe the pharmacological agents used in treatment of various disorders and the medical management of inoperable cases

## Skills

1. Perform a focused history and physical examination in a patient referred for suspected adrenal insufficiency, congenital adrenal hyperplasia, hyperandrogenism, Cushing syndrome, hyperaldosteronism, pheochromocytoma, or adrenal mass
2. Perform and interpret basal, stimulatory, and suppressive tests used to diagnose adrenal insufficiency, congenital adrenal hyperplasia, Cushing syndrome, hypoaldosteronism, hyperaldosteronism, hyperandrogenism, and pheochromocytoma
3. Select appropriate and cost-effective imaging modalities for adrenal lesions
4. Effectively manage emergency situations such as adrenal crisis and hypertensive crisis
5. Manage pre- and post-operative patients with endocrine hypertension
6. Provide perioperative care for patients with adrenal insufficiency
7. Manage pre- and post-operative patients with pheochromocytoma
8. Show skills in educating patients for sick day management of adrenal insufficiency
9. Instruct patients using glucocorticoids on use of medical alert cards
10. Demonstrate ability to manage congenital adrenal hyperplasia
11. Demonstrate ability to investigate and manage patients with suspected adrenal tumors
12. Appropriately refer patients to other specialties when needed, such as endocrine surgery, oncology, radiooncology, interventional radiology, and so on

## Attitude

1. Appreciate the concerns of patients on lifelong replacement for hormonal deficiency and work with them to motivate them for better compliance
2. Recognize the impact of potential surgery and repeated examinations and the importance of compliance in certain adrenal disorders
3. Recognize the urgency of managing adrenal insufficiency
4. Recognize complex management issues in congenital adrenal hyperplasia, especially in females and adolescents, and the need to collaborate with other specialties in this regard
5. Recognize the role of patient and carer education in the long-term management of adrenal diseases



## Thyroid glands disorders

### Knowledge

1. Explain the general anatomy, histology, and embryology of the thyroid gland
2. Discuss physiology of the normal thyroid, including thyroid hormone synthesis and mechanism of action and signal transduction at the level of the thyroid hormone receptor
3. Outline the etiology, clinical presentation, investigation, and treatment of thyroid diseases, including goiter, hypothyroidism, hyperthyroidism, iodine deficiency disorders, thyroiditis, congenital and developmental disorders of the thyroid, thyroid nodules, and thyroid cancer
4. Describe methods of diagnosis and treatment of thyroid eye disease
5. Describe the management of such disorders
6. Demonstrate an understanding of the biochemical and nuclear medicine laboratory tests used in the investigation of thyroid disease
7. Describe the influence of pregnancy and acute critical illnesses on tests of thyroid function and their interpretation
8. Describe the various imaging modalities used in thyroid disorders
9. Describe pharmacological agents used to treat these disorders
10. Describe the guidelines applicable to the use of radioactive iodine for thyroid diseases
11. Describe the implications of pregnancy for the management of thyroid disease

### Skills

1. Demonstrate the ability to take a focused history in a patient referred for thyroid disease
2. Demonstrate appropriate technique in examination of the thyroid and examination of the eyes for evidence of thyroid disease; elicit signs of hypo- or hyperthyroidism
3. Describe, select and interpret thyroid function tests and recognize assay interferences, in addition to thyroid scans and ultrasounds
4. Perform U/S of the thyroid and the ability to do FNA to thyroid nodules after appropriate training using simulation sessions.
5. Skills in reading and interpreting isotope thyroid scans
6. Demonstrate ability to diagnose and manage simple non-toxic goiter and solitary thyroid nodules
7. Use and/or refer for the use of radioisotopes to diagnose thyroid disorders

8. Use and/or refer for the use of radioisotopes in the treatment of hyperthyroidism and goiter
9. Demonstrate the ability to diagnose and manage primary and secondary hypothyroidism
10. Demonstrate the ability to manage thyroid emergencies including thyroid patients in critical care
11. Provide perioperative care for patients undergoing thyroid surgery (particularly preoperative preparation)
12. Demonstrate the ability to investigate and manage patients with thyroid eye disease
13. Demonstrate the ability to manage thyroid disorders during and after pregnancy

### Attitude

1. Demonstrate an understanding of the impact of a diagnosis of thyroid cancer
2. Demonstrate an understanding of patients' concerns regarding lifelong treatment with thyroid hormone, radiation therapy for both Graves' disease and thyroid cancer, and prognosis of thyroid cancer
3. Respect patient's preference and autonomy in choice of treatment
4. Understand the role of multidisciplinary care in the management of patients with thyroid cancer
5. Understand the need to refer selected patients for ophthalmological review and to other healthcare professionals

## Calcium metabolism and disorders of the bone

### Knowledge

1. Describe the histopathology of various bone types, the molecular structure of bone, and the mechanics of bone strength
2. Discuss the normal physiology of calcium and bone metabolism, including the control and action of parathyroid hormone, calcitonin and vitamin D, and mechanisms of bone growth and development
3. Outline the histology of bone development, formation/destruction, bone remodeling units, and factors controlling bone modeling and remodeling
4. Discuss the differential diagnosis, investigation, and treatment of hypo and hypercalcemia, hypo- and hyperphosphatemia, and hypo- and hypermagnesemia in both acute and chronic settings
5. Outline the etiology (including genetic), investigation, and treatment of disorders of bone and mineral metabolism, primary and secondary osteoporosis, osteopetrosis, Paget's disease of bone, and skeletal dysplasia





6. Describe pharmacological agents used in the treatment of osteoporosis and the relevant guidelines
7. Describe the endocrine and metabolic causes of renal stones

### Skills

1. Perform a focused history and examination in patients referred for disorders of mineral disturbances, bone mineral metabolism, osteoporosis, or skeletal dysplasia
2. Describe, select and interpret the appropriate laboratory and radiological investigation of patients with metabolic bone disease and mineral disturbances
3. Effectively manage osteoporosis or disorders of bone mineral metabolism
4. Show ability to read and interpret bone densitometry by DXA scan
5. Show ability to use FRAX tool in the management of osteoporosis

### Attitude

1. Demonstrate an understanding and respect for patient's concerns with regard to treatment for skeletal disorders

## Obesity and weight disorders

### Knowledge

1. Discuss the physiology and pathophysiology of appetite regulation, energy balance, and the interplay in weight control between gut hormones, pancreatic hormones, hormones of adipose tissue, and brain
2. Describe the genetic and environmental factors contributing to obesity
3. Demonstrate knowledge of endocrine and other secondary causes of obesity
4. Describe the short- and long-term health implications of obesity
5. Identify those patients who require referral to bariatric surgery and different procedures used to treat obesity
6. Identify monogenic obesity syndromes and describe their management
7. Demonstrate up-to-date knowledge of pharmacological agents used in treatment of obesity
8. Describe the endocrine consequences of anorexia nervosa, bulimia, and obesity

### Skills

1. Perform a focused history and physical examination in patients referred for obesity, including the detection of signs and symptoms indicating an endocrine cause and/or secondary effects of obesity
2. Identify those patients requiring further diagnostic workup, and describe, select and interpret the appropriate laboratory and radiological investigations

3. Demonstrate the ability to investigate the obese patient in order to exclude endocrine causes
4. Demonstrate the ability to initiate management of the obese patient
5. Diagnose, manage, and provide care for patients with disorders of appetite and weight

#### Attitude

1. Demonstrate sensitivity, understanding, non-judgmental attitude, and respect for a patient's concerns around the psychosocial and health implications of obesity and other weight disorders
2. Recognize the importance of multidisciplinary team management of patients with eating disorders

#### Lipid disorders

##### Knowledge

1. Discuss lipid metabolism, including the metabolic pathway involved and the important receptors, enzymes and control hormones
2. Outline the etiology, clinical significance, investigation, and management of dyslipidemias
3. Describe the patterns of lipid abnormalities seen in patients
4. Discuss the available evidence for benefit from lipid reduction in primary and secondary prevention of cardiovascular risk and relevant guidelines
5. Discuss the genetics of inherited dyslipidemias
6. Describe lipophoresis and its indication
7. Describe anti-lipid medications, the landmark studies, and the range of treatments available for managing lipid abnormalities

##### Skills

1. Perform a focused history and physical examination in a patient referred for suspected dyslipidemia
2. Recognize the important physical findings in dyslipidemia, including the various types of xanthomas, xanthelasma, and retinal lipemia
3. Describe, appropriately select, and interpret laboratory tests to determine etiology and classification of dyslipidemias
4. Use medical calculators and other tools to calculate the cardiovascular risk of a particular patient and discuss it with the patient
5. Educate patients about effectiveness of pharmacological and non-pharmacological interventions for dyslipidemias



## 6. Prescribe lipophoresis appropriately

### Attitude

1. Demonstrate understanding of and be able to counsel patients and families on concerns regarding the effects of their dyslipidemia and its management through diet and daily living, long-term complications, family life, and inheritance of the disorder within the family
2. Understand the implications of drug side effects on the drug compliance of patients and work with them on alternative plans

### Miscellaneous endocrine and metabolic disorders

Diagnose and provide first-line care for patients with rarer endocrine conditions such as neuroendocrine tumors and ectopic hormone production, disorders of hereditary metabolic inborn errors, and other genetic syndromes.

### Knowledge

1. Describe causes of and investigations of neuroendocrine tumors and ectopic hormone production
2. Describe causes and investigations of electrolyte disturbances
3. Describe features of multiple endocrine neoplasia syndromes
4. Describe possible long-term endocrine consequences of treatments for cancer
5. Describe effect of systemic diseases on endocrine function
6. Describe hormonal changes during critical illness on hormone

### Skills

1. Take history, perform physical examination, diagnose, and provide first-line care for neuropeptide-secreting tumors
2. Show ability to investigate and manage hypo- and hypernatremia
3. Show ability to investigate and manage disorders of potassium homeostasis
4. Show ability to investigate and manage disorders of magnesium homeostasis
5. Show ability to diagnose and manage syndromes of ectopic hormone production (e.g., PTHrP, ACTH, ADH)
6. Show ability to take history, perform physical examination, diagnose, and manage syndromes of multiple endocrine neoplasia, including an understanding of genetic testing and strategies for long-term monitoring
7. Show ability to take history, perform physical examination, investigate, and manage the “late endocrine effects” of treatment for cancer
8. Recognize, investigate and manage disorders of insulin resistance

## Attitude

1. Recognize the need to refer to specialist services for complex endocrine disorders
2. Recognize the role played by genetic services in the management of potentially inherited endocrine disorders
3. Recognize the role of MDTs in managing complex endocrine disorders (e.g., ectopic hormone production, neuroendocrine tumors)

## Therapeutics and safe prescribing

Develop ability to initiate, review, and monitor appropriate therapeutic and preventive interventions relevant to endocrine clinical practice.

## Knowledge

1. Demonstrate knowledge in the pharmacology, indications, contraindications, adverse reactions, interactions, and dosage of commonly used endocrine and diabetes drugs
2. Describe tools to promote patient safety and prescription, including electronic clinical record systems and other IT systems
3. Describe the roles of national and international regulations in drug use, monitoring, and licensing
4. Describe institute policy and procedures pertaining to safe drug prescription, including approved abbreviations, high-alert medication, etc.

## Skills

1. Advise patients (and caregiver) about use of medications prescribed, their benefits, important interactions, and adverse drug effects
2. Prescribe appropriately in pregnancy and during breast feeding
3. Make appropriate dose adjustments following therapeutic drug monitoring or physiological change (e.g., deteriorating renal function)
4. Engage the patient/caregiver to optimize concordance with therapeutic regimen
5. Participate in quality improvement projects for safer drug prescription
6. Educate patient in the appropriate use of common endocrine and diabetes medications and provide them with printed educational material

## Attitude

1. Appreciate the importance of a “safe prescription attitude”
2. Appreciate the role of non-medical prescribers
3. Recognize high alert medications such as insulin



4. Recognize that medication errors are amongst the top causes of in-hospital mortality and morbidity and appreciate the importance of reporting of medication errors and adverse drug reactions for quality improvement and management

### Pediatric endocrinology

- The prime site of learning will be the clinic
- The fellow will attend inpatient pediatric endocrine services in an observer role

### Knowledge

1. Show knowledge in epidemiology, investigation, and management of disorders of endocrine and metabolism presenting in neonates, infants, children, and adolescents, such as rickets, precocious puberty, ambiguous genitalia, presentation of CAH at birth and in neonates, neonatal hypoglycemic disorders, delayed puberty, hereditary endocrinopathy, eating disorders.
2. Describe the differences in endocrine drug use between children and adults
3. Discuss principles leading to satisfactory transition of care from pediatric endocrinologist to adult endocrinologist

### Skills

1. Demonstrate skills in the gradual transition of care by parents to self-care by the patients themselves
2. Demonstrate skills in breaking bad news to parents
3. Apply the communication skills required to interact effectively with the pediatric age group and their families

### Attitude

1. Show ability to identify the roles of other health professionals (nurse educators, dietitians, social workers) and family members, and be part of an integrated team for the management of diabetes
2. Show ability to identify patients in need of psychosocial support
3. Understand and recognize one's own limitations treating pediatric conditions, and know when to ask for help

### Inpatient consultation

Inpatient consultation is a work-based experiential learning opportunity. Fellows have direct patient care responsibility, and serve as consultants to other departments under the supervision of the attending endocrinology consultant. Each trainee must attend an average of 12–16 new consults weekly, approximately 3–4 new consults per week, and follow an average of 5–6 additional patients after initial consultation

until hospital discharge, acquiring the diagnostic and therapeutic capabilities for the acute and ultimately long-term care of the inpatients upon whom they consult.

### Knowledge

1. Demonstrate knowledge in indications for admission of endocrine cases
2. Obtain/demonstrate knowledge in diagnosis and management of a spectrum of endocrine and metabolic disorders in patients admitted for acute care under the specialty
3. Obtain/demonstrate knowledge in investigation (including dynamic endocrine test, imaging and biopsy/FNA, and diagnostic procedures such as BIPSS and AVS), diagnosis, and management of a spectrum of endocrine and metabolic disorders in patients admitted for workup under the specialty
4. Describe the institutional policy and procedures governing inpatient care, including drug prescription policies and procedures, etc.
5. Describe the institutional policy and procedures for providing inpatient consultation services to other departments
6. Describe quality indicators and key performance indicators in inpatient services, such as documentation in medical records, length of stay for particular groups of disorders, discharge and continuity of care plan, etc.

### Skills

1. Obtain timely history and perform physical examination with synthesis of provisional diagnosis, differential diagnosis, problems list, and plan of investigation, management, and discharge
2. Demonstrate accurate documentation in medical record
3. Relay and discuss a case in a timely manner with the attending endocrinologist and get his/her approval
4. Establish therapeutic relationships with patients, communicating the information and plan and identifying and respecting their autonomy
5. Establish a professional relationship with the inpatient team, such as nurses, etc.
6. Demonstrate safe handover of patient care to other team members using appropriate written and verbal communication
7. Effectively consult with other physicians
8. Liaise with other health professionals (pathology, radiology, laboratory, surgery etc.) in care of inpatients
9. Ensure appropriate discharge plan and continuity of care within or outside the facility



10. Delegate appropriately within the team
11. Prioritize the assigned duties and manage time well
12. Implement accepted preventative measures
13. Aid in the learning of the students, interns, and residents assigned to the unit
14. Demonstrate ability to triage and prioritize consultations
15. Utilize healthcare resources in a cost-effective manner

### Attitude

1. Deliver the highest-quality care with integrity and practice medicine in an ethically responsible manner
2. Recognize one's own limitations
3. Answer pages promptly
4. Recognize the importance of collaboration with other healthcare professionals to provide optimal care

### Consultation to other departments

#### Knowledge

1. Show knowledge of components of effective collaboration and teamwork
2. Show knowledge of roles and responsibilities of members of the healthcare team
3. Show knowledge of ways in which individual behaviors impact on others: personality types, group dynamics, learning styles, leadership styles, etc.
4. Show knowledge of team dynamics: the way a group, team, or department functions
5. Show knowledge of institute policy and procedure regarding consultation
6. Show knowledge of how to structure a consultation appropriately
7. Show knowledge of how to attend and provide consultation appropriately

#### Skills

1. Establish rapport with others healthcare professionals focusing on providing optimal care for patients
2. Attend consultation promptly and timely
3. Prioritize consultations based on emergency situations
4. Analyze consultation questions clearly, accurately, and appropriately
5. Clarify ambiguous information
6. Identify and manage communication barriers with other colleagues
7. Prevent and resolve conflict with others, providing feedback and rectifying dysfunction
8. Obtain accurate history focusing on endocrine issues
9. Perform examination relevant to patient's presentation
10. Manage time and draw consultation to a close appropriately, concluding with a summary, problems list, differential diagnosis and recommend appropriate investigation, management and if needed follow-up and continuity of care or discharge and effective handover of care
11. Ensure the documentation of your consultation

### Attitude

Approach consultation with compassion and professionalism, using appropriate



behavior and language

2. Take leadership and demonstrate to others good practice
3. Show willingness to collaborate with other healthcare professionals

## Research

### Knowledge

1. Demonstrate knowledge of good clinical practice and guidelines in research
2. Demonstrate knowledge of research principles
3. Demonstrate knowledge of differences between audit and research
4. Demonstrate knowledge of principles of qualitative, quantitative, bio-statistical, and epidemiological research methods

### Skills

1. Develop critical appraisal skills and apply these when reading literature
2. Obtain consent for research
3. Demonstrate the ability to write a research proposal, research manuscript, and scientific publication
4. Demonstrate good verbal and written presentation skills

### Attitude

1. Follow guidelines on ethical conduct in research and consent for research
2. Demonstrate integrity, honesty, responsibility, and compassion
3. Be able to handle criticism
4. Have insight into own abilities



## IX. CONTINUUM OF LEARNING

This short section describes the expected learning that should take place in each key stage of progression within endocrine and metabolic medicine.

Trainees are reminded of the fact of life-long Continuous Professional Development (CPD). Trainees should keep in mind the necessity of CPD for every healthcare provider in order to meet the demand of their vital profession. The following table states how the role is progressively expected to develop throughout junior, senior and consultant levels of practice.

F1	F2
Gain a broad knowledge of basic science of various endocrine glands	Gain advanced knowledge in basic science of hormones, their receptors, actions and mechanisms; embryology, anatomy, histology and physiology of endocrine glands; pathways and homeostasis of carbohydrate, lipid, protein metabolism; hypothalamus-pituitary-endocrine axis; feedback loop; target organ action; hormonal resistance
Gain broad knowledge in clinical endocrinology, including clinical manifestation of endocrine diseases, etiology, pathogenesis, and complications	Gain advanced knowledge in clinical endocrinology, including clinical manifestation of endocrine diseases, etiology, pathogenesis, and complications
<p>Develop skills in obtaining accurate, concise, and focused endocrine history</p> <p>Perform physical examination focusing on endocrine disease, diabetes, metabolism</p> <p>Compose summary of problems</p> <p>Compose provisional diagnosis and differential diagnosis</p> <p>Suggest and discuss workup plan and management and treatment plan and discuss with attending physician</p>	<p>Gain proficiency in obtaining history and performing physical examination pertaining to endocrinology and metabolism, summarizing problem, composing diagnosis and differential diagnosis, investigation, and management plan</p> <p>Analyze and interpret finding to reach a final diagnosis</p> <p>Execute the plan after approval of the attending consultant</p> <p>Gain proficiency in referral and consultation requests as well as medical reports</p> <p>Gain proficiency requesting cost-effective laboratory and radiological tests</p>

Develop skill in documentation of progress notes using format such as SOAP including measurable management goals, patient education, and discharge plan	Proficiency in progress note documentation, measurable management goals, patient education, and discharge plan
Obtain knowledge and skill in the management of common endocrine emergencies, namely, diabetic ketoacidosis, hypoglycemia, adrenal crisis, hypo- and hypercalcemic crisis, hyperglycemic hyperosmolar state, hypo- and hypernatremia	Gain advanced knowledge and skill in management of all endocrine emergencies: diabetic ketoacidosis, hypoglycemia, adrenal crisis, hypo- and hypercalcemic crisis, hyperglycemic hyperosmolar state, management of hypo- and hypernatremia, and rare endocrine emergencies such as thyroid storm and myxedema coma
Acquire knowledge and skills in non-invasive dynamic endocrine tests including ACTH stimulation test, dexamethasone suppression test, GnRH test, TRH test, OGTT,	Interpret results of Insulin tolerance test, glucagon stimulation test, clonidine test, 72-hours fasting protocol for hypoglycemia, water deprivation test
Ultrasound, thyroid and FNA: attending and observing procedures, simulation course	Ultrasound thyroid and FNA: simulation then hands-on
Insulin pump therapy: basic knowledge and principles, technical issues	Able to read and interpret download data of pump and sensor and adjust setup
CGMS: basic knowledge of CGMS, different CGMS, insertion of CGMS	Interpret and use download data to adjust diabetes treatment for better glycemic control
MRI and CT-scan: gain basic skills in reading MRI and CT-scan of pituitary and adrenal glands respectively, through attending and discussing cases with the radiologist	Gain proficiency reading MRI and CT scan images of pituitary and adrenal glands respectively.
DXA scan: training in reading	Become expert in reading DXA scan
Knowledge/skill in using diagnostic nuclear medicine, such as thyroid scan, sestamibi parathyroid scan, MIBG	Gain knowledge/skill in therapeutic nuclear medicine (e.g., RAI for hyperthyroidism or thyroid cancer)
Bilateral inferior petrosal sampling (BIPSS): attend and observe at least one procedure	Attend and observe at least 2 procedures and help organize blood samples in sequence and interpret the results.
AVS: attend and observe at least one procedure	Attend and observe at least 2 procedures and help organize blood samples in sequence and interpret the results.
Participate in teaching medical students and residents in rounds and clinics	Supervise, teach, train senior residents/fellows; supervise/organize academic activities



---

# X. TEACHING METHODS:

---

The teaching process in postgraduate fellowship training programs is based mainly on the principles of adult learning theory. The trainees' feel the importance to learn and to have active roles in the content and the process of their own learning. The training programs implement the adult learning concept on each feature of the activities where the residents are responsible for their own learning requirements.

Endocrinology has the highest competition ratio of all medical specialties. To obtain the best chance of gaining knowledge and skills, the fellow must take advantage of all of the potential learning experiences available. To do so, he/she must assess his learning needs and identify the areas on which he must devote most focus.

The role of the educational supervisor is to help guide the education of fellows, but it should be noted that fellows are primarily in control of furthering their own learning. As a result, before beginning a rotation fellow will find it useful to create a professional development plan with specific, measurable, and achievable objectives.

In the ward, if a fellow is not leading the ward round or clerking new admissions, he/she should question seniors about their decisions and management plans in order to gain more benefit from his/her ward experience. He/ She should observe his/her seniors and the manner by which they manage patients and their relatives, as well as how they break bad news; he/she should then endeavor to incorporate the positive aspects of these interactions into his/her own discussions with patients and their relatives. In addition, he/she should learn practical measurement skills relevant to diagnosis and interpretation in different basal and dynamic tests, as this is essential for diagnosing different endocrine diseases and guiding disease management.

While working in the emergency department the fellow should take time to reflect on his/her current clinical performance and how he/she can improve or do things

differently in the future. He/she should consider things that could have been conducted differently and whether he/she made any mistakes. If he/she is uncertain, it is worth having a discussion with his/her seniors or educational supervisor, as this reflection is crucial for improving future practice. As he/she progresses in his/her career, this will give him/her confidence in regard to the management of patients with similar presentations.

Although ward-based learning covers acute endocrinology, outpatient clinics will help the fellow gain greater insight into the management of chronic endocrinology conditions. Specialist clinics, such as those for heart failure, hypertension, cardiomyopathy, and pacemakers are definitely worth attending. The fellow should clerk new patients and present his/her findings to a senior, along with a provisional management plan. This will help him/her learn more about the pathophysiology, investigation, and management of these patients.

The time that the fellow spends on the ward or in clinic is the perfect opportunity to have workplace- based assessments signed off. The benefit of doing these assessments properly is that the supervisor can provide formal feedback on all your clinical skills and knowledge. A workplace-based assessment should include a senior observing the fellow taking a history, examining the patient, formally presenting a case, and being questioned on it. He/she should tell his/her senior that he/she would like an acute-care-assessment tool completed before the ward round or before he presents his/her cases. For multisource feedback, it is always worth requesting feedback from people that the fellow believes do not like him/her; such people generally provide the harshest criticisms, meaning that the fellow can use this to determine additional means of improving his/her clinical performance.

The learning opportunities in endocrinology are vast and there for the fellow to take. He/she should be keen, enthusiastic, and proactive towards making the most of his/her endocrinology rotation. The best advice one can offer him/her is to enjoy his/her learning experience.

Formal training time would include the following three formal teaching activities:



- Program Specific Learning Activities
- Universal topics
- General Learning Opportunities

## 1. PROGRAM SPECIFIC LEARNING ACTIVITIES:

The program specific activities are educational activities that are specifically designed and intended for trainees' teaching during their training time. The trainees are required to attend these activities and non-compliance can subject trainees to disciplinary actions. It is advisable to link the attendance and the participation in these activities to the continuous assessment tools (see formative assessment section below). Program administration should support these activities by providing protected-time for trainees to attend these activities and allow them to participate in such activities.

### 1.1 Academic half-day:

- The academic half day consists of several types of sessions scheduled by the fellows and program director, and includes:
  - Basic science
  - Endocrine Emergencies
  - Clinical problem solving
  - Demonstration and practice of procedures
  - Communication skills
  - Data interpretation
  - Medical research and statistics
- The Academic Half-Day program is a mandatory component of the fellowship program. It is designed to complement the clinical experience that fellows gain during their clinical rotations. Substantial effort should be made into making these sessions interesting and relevant.
- Educational activities should be conducted on a weekly bases and contain different educational methods and strategies. These methods include, but are not restricted to, the following: problem solving, case discussion, interactive mini lectures, group discussion, tutorials, workshops, and assignments.

- In all educational sessions, emphasis should be placed on important issues relating to ethics, evidence-based medicine, practice management, disease prevention, health promotion, proper communication skills, and professionalism. Please adhere to the training preprogram mission and the Saudi Commission manual.
- Attendance should be registered and a copy of the attendance record will be retained for report and documentation.
- Each trainee must attend 100% of the academic half day sessions unless excused by the program director. During the first three months of the academic year, trainees with poor attendance shall receive a reminder or warning letter concerning their unjustified absences. Trainees who continue to show poor attendance without providing an acceptable reason will be sent a second warning letter. Further action
- will be taken according to the Saudi Commission rules and regulations in this regard

Date	AHD	Topic	Time	Presenter
JANUARY				
3	Thursday	Fellows orientation (all fellows)	8:45-8:55	Dr.Mussa
		Case Discussion:	09:00-09:30	Dr. Ansari
		Pituitary Incidentalomas	10:00-10:30	Dr. Ashwaq
		Diabetes Emergencies: DKA/HHS	10:30 –11:00	Dr. Reem
		DM landmarks trials	11:00-12:00	Consultant: Dr.Imad
10	Thursday	Management of Hyperglycemia in Hospitalized Patients in Non-Critical Care Setting	09:00-09:30	Dr. Twajiri
		Case Discussion: Paget's Disease of bone	10:00-10:30	Dr. Egbal
		Outpatient Glucose Monitoring - consensus and guidelines review	10:30 –11:00	Dr. AlHarthi
		Endocrine Emergencies: Acute Hyper/hypocalcemia	11:00-12:00	Consultant: Dr. AlMohaya
17	Thursday	Work-up of patient with primary Hyperaldosteronism	09:00-09:30	Dr. Arwa
		Case Discussion:	10:00-10:30	Dr. Ebtihal
		Lipid Guideline review	10:30 –11:00	Dr. Sedra
		Endocrine Emergencies: Acute adrenal insufficiency	11:00-12:00	Consultant: Dr.Yasser



24	Thursday	Approach to patients with short stature	09:00-09:30	Dr. Ebtisam
		Case Discussion:	10:00-10:30	Dr. Ebtihal
		Management of DM during Enteral Feeding and TPN	10:30 –11:00	Dr. Bayan
		Endocrine Emergencies: Myxedema Coma/ Thyroid Storm	11:00-12:00	Consultant: Dr.AIGhamdi
30	Thursday	Management of DKA in special groups (e.g CKD, pediatrics, pregnancy).	09:00-09:30	Dr. Walaa
		Case Discussion:	10:00-10:30	Dr. Hessah
		ACROMEGALY WORKUP and treatment	10:30 –11:00	Dr. Metib
		Pituitary topic review – NFPA, evaluation and some MRI image, CUSHING related HEMODYNAMIC testing	11:00-12:00	Consultant: Dr.Mussa

### 1.1.1. Endocrine Emergencies lectures

Lectures concerning endocrine emergency conditions are prepared and presented by a fellow. The series of topics is repeated annually to ensure adequate attainment.

The objectives of these sessions are as follows:

1. Recognize common and uncommon endocrine emergency situations as these conditions carry high risk of mortalities and morbidities.
2. Develop skills in diagnosing (including the use of scoring systems) and managing these emergencies as per evidence guidelines
3. Develop skill in communicating with other professionals, patients/relatives in an emergency situation

### 1.1.2. Clinical Problem Solving:

#### Approaches to common conditions and symptoms

These are lecture series concerning systematic approaches to common endocrine conditions, with symptoms prepared and presented by a fellow during academic half days under the supervision of a consultant. These series are repeated annually.

The objectives of this activity are:

1. Demonstrate diagnostic and therapeutic skills

2. Access and apply relevant information to clinical practice
3. Practice contemporary, evidence-based, and cost-effective medicine
4. Avoid unnecessary or harmful investigations or management

### Clinical Skills

Most clinical skills sessions will be conducted at the bedside. This includes taking history, conducting physical examinations, and communication skills. However, lectures and video demonstrations can be added to academic half-day activities before bedside practice.

The objectives of the clinical skills session are as follows:

1. Recognize the many facets of the doctor-patient relationship and be able to apply a bio-psychosocial model to issues in health and medicine.
2. Master basic interview and communication skills, and demonstrate competence in advanced interview and communication skills.
3. Master basic physical examination skills and be able to perform and interpret focused examinations of the cardiovascular, pulmonary, musculoskeletal, and neurological systems; breasts; and genitalia in men and women.
4. Exhibit professional behaviors, including the demonstration of respect for patients, colleagues, faculty members, and others in all settings.
5. Help fellows to pass clinical exams.

#### 1.1.3. Procedural Skill

Objectives are:

1. Apply knowledge and technical expertise in performing procedures, interpreting results, and understanding relevant limitations
2. Demonstrate effective, appropriate, and timely performance of therapeutic procedures
3. Demonstrate evidence-based physical examination skills that are relevant and precise
4. Demonstrate procedures on a task trainer

#### Procedures list:

The procedures list should be divided into three categories:





- Category I: Assumed competent (i.e., previously learned). Category I procedures might include venipuncture, simple suturing, arterial blood sampling, etc. Category II: Core specialty-level procedures. These are the procedures in which to be learned and certified competent during the posting.
- Category III: Mastery-level procedures. Trainees are expected to be competent at the end of F2.

The trainee needs to declare that he/she is competent in Category I procedures. If for any reason a trainee is not competent in any given Category I procedure, he/she should be provided supervised training.

## List of Category I Procedures

List of Category I Procedures	List of Category I Procedures	Declaration by the Trainee
Venipuncture		
Capillary blood sampling		
Arterial blood sampling		
Basic Life Support		

## List of Category II Procedures

List of Category II Procedures	List of Category II (Core) Procedures	Certified Competent by Supervisor	Declaration by the Trainee
Dynamic Endocrine Testing			
Ultrasound thyroid			
Interpretation of CT adrenal			
Interpretation of pituitary MRI			
Attend DXA scan (BMD)			
Attend IPSS			
Attend AVS			

## List of Category III Procedures

List of Category III Procedures	List of Category III (Mastery) Procedures	Certified Competent by Supervisor	Declaration by the Trainee
Ultrasound guided thyroid FNA			
Lipophoresis (when available)			

### 1.1.4. Communication Skills

The competencies for this role are essential for establishing rapport and trust, formulating a diagnosis, delivering information, striving for mutual understanding, and facilitating a shared care plan. Poor communication

can lead to undesirable results, and effective communication is critical for optimal patient outcomes.

Physicians enable patient-centered therapeutic communication via decision making and effective dynamic interactions with patients, families, caregivers, fellow professionals, and other important individuals. A series of communication skills lectures concerning common situations is delivered by experienced staff members regularly during academic half days and repeated annually.

### List of Behavioral/Communication Skills

List of Category I Behavioral and Communication Skills	Declaration by the Trainee
Breaking bad news	
Obtaining informed consent for FNA thyroid	
Writing clear, concise professional consultation to other specialties	
Writing clear handover communication letter	

List of Category II Behavioral and Communication Skills	Certified Competent by Supervisor	Declaration by the Trainee
Preconception counseling of diabetic women of reproductive age		
Preconception counseling of woman of reproductive age with hypothyroidism		
Preconception counseling of woman of reproductive age who receive RAI		
Production of educational materials for diabetic patients and patients with other endocrine disorders		

#### 1.1.5. Medical Ethics:

Ethical issues are frequently encountered during clinical practice, and discussing medico-legal aspects of care with experts is of paramount importance for better and safer training and practice. A senior staff member will raise a particular medico-legal issue to be discussed interactively with fellows during academic half days.

The competencies of this activity are as follows:

1. Recognize the humanistic and ethical aspects of a career in medicine.
2. Examine and affirm personal professional moral commitments.



3. Equip fellows with a foundation of philosophical, social, and legal knowledge.

Apply knowledge that has been gained in clinical reasoning and provide fellows with the skills required to apply this insight, knowledge, and reasoning to clinical care.

#### 1.1.6. Data Interpretation

A full range of laboratory data encountered during daily practice (e.g., blood test, DXA scan, images) is presented during academic half-days. A case-based approach is used to assist trainees in digesting and understanding the plethora of investigations with which they should be familiar. All fellows are expected to participate in this activity. The objectives of the activity are as follows:

1. Gain knowledge of the various investigational tools used in internal medicine.
2. Enhance proper interpretation of different investigational data.
3. Enhance proper use of investigational tools.
4. Discuss the advantages and limitations of various investigational tools.

#### 1.1.7. Research and evidence-based practice

The Saudi Commission for Health Specialties promotes and supports research conducted by trainees. Therefore, fellows are expected to participate in annual research projects. The presentation and dissemination of the work produced occurs during formal research days held annually at various centers.

These projects are required to result in publications or a national/international presentation. The objectives of the research aspect of the internal medicine program are as follows:

1. Become familiar with the generation and dissemination of research via oral presentations, poster presentations, and abstract preparation and attend core academic teaching applicable to research including ethics, study design, abstract writing, and presentation skills
2. Gain competence in conducting literature reviews, data synthesis and analysis, and interpretation

## 1.2 Clinical/practical teaching:

This includes courses and workshops (e.g. Simulations), standardized patient's bedside teaching)

It is highly advisable to integrate these activities with formative assessment tools that are relevant to them (e.g. DOPS, mini-CES, Logbook, etc.).

## 1.3 Practice-based learning:

Training exposures during bedside, lab., radiology, and other work related activities represent excellent targets for learning. Trainees are expected to build their capacity based on self-directed learning. On the other hand, practice-based learning allows the educator to supervise trainees to become competent in the required program practical skills which ensure fulfilling knowledge, psychomotor and/or attitude learning domains. Each trainee needs to maintain a logbook documenting the procedures observed, performed under supervision, and performed independently. It would be prudent to determine the minimum number of procedures to be performed before training completion and the minimum number needed to maintain competency after certification.

### 1.3.1. Daily round-based learning

The daily round is a good opportunity to conduct bedside teaching for fellows, usually those involved in caring for patients.

The objectives are as follows:

1. Document historical and physical examination findings, including complete written databases; problem lists; and focused subjective, objective, assessment, and plan notes according to accepted formats
2. Generate differential diagnoses appropriate to the level of training
3. Review admission notes, discharge summaries, and medical reports
4. Develop evidence-based management plans
5. Interpret lab investigation results
6. Consult with professionals of other disciplines
7. Communicate, including discussing risk factors and prevention, with patients and their families
8. Discharge and follow-up plans



### 1.3.2. On-call duty-based learning:

All fellows are required to undertake a minimum of 7–10 on-call duty shifts, each lasting 12-24 hours, per month

The objectives are as follows:

1. Elicit a comprehensive history and perform a complete physical examination on admission, record the patient's assessment and a differential diagnosis of medical problems clearly, and initiate the management plan
2. Discuss the management plan, including investigations and a treatment plan, with consultant.
3. Communicate the plan to the nurse assigned to patient care
4. Perform the basic procedures necessary for diagnosis and management
5. Supervise residents' admission notes and orders and discuss/supervise the implementation of proposed management plans
6. Supervise residents' skills in taking history and conducting physical examinations
7. Assist residents in interpreting laboratory investigations and performing bedside diagnostic and therapeutic procedures
8. Attend to consultations, including those involving emergencies, within and outside the department and participate in outpatient clinics once or twice per week

### 1.3.3. Clinic-based learning (CBL):

The objectives are as follows:

1. Elicit a focused history and perform a physical examination under the supervision of the consultant
2. Present clinical findings, in brief, to the attending consultant
3. Discuss differential diagnoses and management plans with attending consultants
4. Record patients' assessments, differential diagnoses, and management plans
5. Develop communication skills with the attending consultant
6. Conduct patient follow up under the supervision of the attending consultant for a prolonged period

7. Supervise residents' notes and orders and manage attending junior residents
8. Discuss the need for specialized procedures with the consultant
9. Elicit clinical signs for residents
10. Interpret and discuss laboratory results with residents.
11. Assess the performance of residents in terms of communication skills, focused history taking, and physical examination

#### 1.3.4. Self-directed learning (SDL):

1. Achieving personal learning goals beyond those of the essential core curriculum
2. Maintenance of a personal portfolio (self-assessment, reflective learning, and personal development plan)
3. Auditing and researching projects
4. Reading journals
5. Attendance at training programs organized on a regional basis (e.g., symposia, conferences, and board reviews)
6. Universal e-learning topics: The Saudi Commission for Health Specialties intends to develop an e-learning platform to deliver high value, interdisciplinary topics of the utmost importance to the trainee to ensure that they all receive high quality teaching and develop essential core knowledge. These topics are common to all specialties and are delivered in a modular fashion. At the end of each learning unit, there is an on-line formative assessment. Upon completion of all topics, trainees undertake a combined summative assessment in the form of context- rich multiple-choice questions (MCQ) in which they must attain minimum competency

#### 1.4 Morning report:

The morning report is a universal component of endocrinology training. Though there is a wide variation in format, attendance, and timing, all fellows share the common goal of case presentation for the purposes of educating resident physicians, monitoring patient care, and reviewing management decisions and their outcomes. The morning report is conducted from Sunday to Thursday mornings each week and lasts for 45–60 min. The team that have been on call the previous night briefly present and discuss all admitted patients with the audience, with an emphasis on history, clinical findings, differential diagnoses, acute



management, and future plans. The fellow or morning report moderator decides the format or theme of the meeting. The meeting should include short cases, long cases, data interpretation, and a topic presentation lasting 5 min.

**The objectives of the morning meetings are as follows:**

To educate all attending fellows, monitor patient care, and review management decisions and their outcomes

1. To develop competence in a short presentation of details regarding all admitted patients in a scientific and informative fashion
2. To learn and gain confidence in presenting long cases in a systematic fashion
3. To develop appropriate differential diagnoses and suitable management plans
4. To present a topic presentation of the disease of interest lasting 5 min
5. To gain experience in debate in a scientific way

### 1.5 Morbidity and mortality conferences

Mortality and morbidity conferences are conducted at least once every 4–8 weeks. The program director and department chairperson assign the task to a group of trainees who prepare and present the cases to all department members. The proceedings are generally kept confidential by law.

The objectives of mortality and morbidity conferences are as follows:

1. To focus on the goal of improving patient care and identifying areas of improvement for clinicians involved in case management
2. To prevent errors that lead to complications
3. To modify behavior and judgment based on previous experience
4. To identify system issues, such as outdated policies and changes in patient identification procedures, that may affect patient care

### 1.6 Grand rounds/guest speaker lectures

These events are presented by experienced senior staff members on a weekly or monthly basis. The topics will be selected from core curriculum knowledge.

The objectives of the grand rounds are as follows:

1. Increase the physicians' medical knowledge and skills and ultimately improve patient care
2. Understand and apply current practice guidelines in the field of endocrinology
3. Describe the latest advances and research in the field of endocrinology
4. Identify and explain areas of controversy in the field of endocrinology



## 1.7 Case presentation

Case presentation is conducted weekly by an assigned fellow under the supervision of consultant. The cases presented are those that involve interesting findings, unusual presentation, or difficult diagnosis or management.

1. The objectives of case presentation are as follows:
2. Present a comprehensive history and physical examination with details pertinent to the patient's problem
3. Formulate a list of all of the problems identified in the patient's history and physical examination
4. Develop an appropriate differential diagnosis for each problem
5. Formulate a diagnosis and treatment plan for each problem
6. Present a follow-up patient's case in a focused, problem-based manner that
7. includes pertinent new findings and diagnostic and treatment plans
8. Demonstrate a commitment to improving case presentation skills by regularly seeking feedback regarding presentations
9. Record and present data accurately and objectively.

## 1.8 Journal clubs, critical appraisal, and evidence-based medicine

The journal club meeting is conducted at least once every 4 weeks. The fellow or program director chooses a new article from a reputed journal and forwards it to one of the fellows at least 1-2 weeks prior to the scheduled meeting. The objectives of the journal club are as follows:

1. Promoting continuing professional development
2. Remaining abreast of current literature  
Disseminating information and building a debate on good practice



3. Ensuring that professional practice is evidence based  
Learning and practicing critical appraisal skills  
Providing an enjoyable educational and social occasion

### 1.9 Joint specialty meetings (radiology, pathology, and surgery)

Joint specialty meetings involving radiologists, pathologists, or surgeons are conducted once per week/month (based on the institution, but at least once/month).

The objectives of the joint specialty meeting are as follows:

1. Provide the knowledge, technical skills, and experience necessary for fellows to interpret and correlate pathological changes with clinical findings and laboratory dates for procedures such as radiological imaging.
2. Promote effective communication and share expertise with peers and colleagues
3. Promote the development of investigative skills to improve residents' understanding of pathological processes as they apply to both individual patients and the general patient population
4. Promote the acquisition of knowledge and provide experience in laboratory direction and management and encourage fellow to assume a leadership role in the education of other physicians and allied health professionals.

## 2. UNIVERSAL TOPICS

Universal topics are educational activities that are developed by SCFHS and are intended for all specialties. Priority will be given to topics that are of:

- High value
- Interdisciplinary and integrated
- Require expertise that might be beyond the availability of the local clinical training sites

Universal topics has been developed by SCFHS and are available, as e-learning via a personalized access for each trainee (to access the online modules). Each universal topic will have a self-assessment at the end of the module. As indicated in the “executive policies of continuous

assessment and annual promotion”, universal topics are mandatory component of the criteria for the annual promotion of trainees from their current level of training to the subsequent level. Universal topics will be distributed over the whole period of training.

The following universal topics are of importance to the adult endocrine fellowship:

### Modules Appendix C

## 3. GENERAL LEARNING OPPORTUNITIES:

A formal training time should be supplemented by other practice-based learning (PBL) such as:

- Involvement in quality improvement committees and meeting  
The fellow has to present one Quality Improvement Project; examples of Quality Improvement Projects:
  - Pediatric-to-Adult transition of care
    - Type 1 diabetes
    - Growth hormone deficiency
  - Hypoglycemia Prevention Initiative in insulin users
  - Achieving the targets in Diabetes Quality Indicators
- Continuous professional activities (CPD) relevant to the specialty of endocrinology, obesity and metabolism

The fellow has to attend at least one per year of the following meetings/seminars/symposia/ conference/workshops and provides a certificate of attendance to the program director:

- Saudi Society of Endocrinology and Metabolism (SSEM)
- Saudi Scientific Diabetes society (SSDS)
- Saudi Osteoporosis Society (SOS)
- Saudi Arabia Society of Metabolic and Bariatric Surgery (SASMBS)
- American Association of Clinical Endocrinologist (AACE) (optional)
- Endocrine Society (US-ES) (optional)
- American Diabetes Association (ADA) (optional)
- European Association of Diabetes Study (EASD) (optional)



- International Diabetes Federation (IDF) (optional)
- International Osteoporosis Foundation (optional)
- American Thyroid Association (ATA) (optional)

## Expected Level of Competency

Expected Level of Competency for Core-Level Endocrine and Metabolism Problems Competency Level	F1	F2
Take a focused history and perform physical examination		
Triage and prioritize the patients		
Render immediate/emergency management		
Generate the most likely diagnosis and focused differential diagnoses		
Describe the patho-physiological/clinic-anatomical basis of the condition		
Rationalize, order, and interpret appropriate investigations		
Recognize secondary complications/adverse events/severity		
Counsel patients/families/caregivers regarding		
Manage complex psychosocial/financial/behavioral aspects of the condition		
Teach students, fellow colleagues, and other healthcare professionals regarding the condition		

Expected Level of Competency for Master-Level Endocrine and Metabolism Problems Competency Level	F1	F2
Take a focused history and perform physical examination		
Triage and prioritize the patients		
Render immediate/emergency management		
Generate the most likely diagnosis and focused differential diagnoses		
Describe the patho-physiological/clinico-anatomical basis of the condition		
Rationalize, order, and interpret appropriate investigations		
Recognize secondary complications/adverse events/severity		
Counsel patients/families/caregivers regarding		
Manage complex psychosocial/financial/behavioral aspects of the condition		
Teach students, fellow colleagues, and other healthcare professionals regarding the condition		

## TABLE OF TEACHING AND LEARNING ACTIVITIES LINKED TO CanMEDS

DIDACTIC CENTRALIZED COMPONENT OF THE CURRICULUM			
ACTIVITY	OBJECTIVES	CanMED COMPETENCIES	COMMENTS
Case Presentation	<ul style="list-style-type: none"> <li>• Be able to present endocrine-related history and physical examination with details pertinent to a patient's problem</li> <li>• Create a list of all problems identified in the history and physical examination</li> <li>• Develop a proper differential diagnosis for each problem</li> <li>• Formulate a diagnosis/treatment plan for each problem</li> <li>• Present a follow up on a patient's case in a focused and problem-based manner, including pertinent new findings and diagnoses and treatment plans</li> <li>• Demonstrate a commitment to improving case presentation skills by regularly seeking feedback on presentations</li> </ul> <p>Fellows should accurately and objectively record and present data.</p>	<ul style="list-style-type: none"> <li>• Medical Expert</li> <li>• Scholar</li> </ul>	Records of proceedings are kept confidential
Journal Clubs	<ul style="list-style-type: none"> <li>• Promoting a continuing professional development</li> <li>• Keeping up-to-date with the literature</li> <li>• Disseminating information and stirring debate on good practice</li> <li>• Ensuring that professional practice is evidence based</li> <li>• Learning and practicing critical appraisal skills</li> </ul> <p>Providing an enjoyable educational and social occasion</p>	<ul style="list-style-type: none"> <li>• Medical Expert</li> <li>• Scholar</li> <li>• Health Advocate</li> </ul>	The presenter is a fellow under a senior staff supervisor.



Grand Round	<ul style="list-style-type: none"> <li>• Provide the knowledge, technical skills, and experience necessary for endocrine</li> <li>• fellows to interpret and correlate clinical findings and laboratory data</li> <li>• Promote effective communication and sharing of expertise with peers and colleagues</li> <li>• Promote the development of investigative skills to better understand pathologic processes as they apply to both individual patients and the general patient population</li> <li>• Promote the acquisition of knowledge, provide experience in laboratory direction and management, and encourage fellows to assume a leadership role in the education of other physicians and allied health professionals</li> </ul>	<ul style="list-style-type: none"> <li>• Medical Expert</li> <li>• Communicator</li> <li>• Collaborator</li> <li>• Manager</li> </ul>	Fellows will present a brief history followed by a discussion with senior staff from other disciplines.
Self-Directed Learning	<ul style="list-style-type: none"> <li>• Achieve personal learning goals beyond the essential and core curriculum</li> <li>• Maintain a personal portfolio (self-assessment, reflective learning, personal development plan)</li> <li>• Audit and research projects</li> <li>• Read journals</li> <li>• Attend training programs organized on a regional basis (Symposia, Conferences, Board review, etc.).</li> </ul> <p>E-learning of universal topics (modules)</p>	<ul style="list-style-type: none"> <li>• Medical Expert</li> <li>• Scholar</li> <li>• Manager</li> <li>• Professional</li> </ul>	See below the Recommended e-learning modules, books, journals, and other materials

---

# XI. ASSESSMENT AND EVALUATION

---

## 1. Purpose of Assessment

Assessment plays a vital role in the success of postgraduate training. Assessment will guide trainees and trainers to achieve defined standards, learning outcomes, and competencies. On the other hand, the assessment will provide feedback to learners and faculty regarding curriculum development, teaching methods, and quality of the learning environment. A reliable and valid assessment is an excellent tool to assess the curriculum alignments between the objectives, learning methods, and assessment methods. Finally, Assessment assure patients and the public that health professionals are safe and competent to practise

Assessment can serve the following purposes:

- a. **Assessment for learning:** As trainers will use information from trainees' performance to inform their learning for improvement. It enables the educators to use information about trainee's knowledge, understanding and skills to provide feedback to trainees about learning and how to improve.
- b. **Assessment as learning:** involves trainees in the learning process where enable them to monitor their own progress. Trainees use self-assessment and the educators' feedback to reflect on their progression. It develops and supports trainees' metacognitive skills. Assessment as learning is crucial in helping residents/fellows become lifelong learners.
- c. **Assessment of learning:** uses to demonstrate achievement of your learning. This is graded assessment and usually counts towards the trainee's end-of -training degree.
- d. **Feedback and evaluation:** As assessment outcomes will represent a quality metrics that can improve learning experience.



Miller's Pyramid of Assessment provides a framework for assessing the trainees' clinical competences which acts a road map for the trainers to select the assessment methods to target different clinical competencies including "knows," "knows how," "shows how," and "does" Appendix

## 2. Formative Assessment (Continuous Assessment)

### 2.1 General Principles

Trainees, as an adult learner, should strive for feedback throughout their journey of competency from "novice" to "mastery" levels. Formative assessment (also referred to as continuous assessment) is the component of assessment that is distributed throughout the academic year aiming primarily to provide trainees with effective feedback.

Every two weeks at least 1 hour should be assigned by trainees to meet with their mentors, in order to review performance reports (e.g. ITER, e-portfolio, mini-CEX, etc).

Input from the overall formative assessment tools will be utilized at the end of the year to make the decision of promoting each individual trainee from current-to-subsequent training level. Formative assessment will be defined based on the scientific (council/committee) recommendations (usually updated and announced at the start of the academic year).

According to the executive policy on continuous assessment (available online: [www.scfhs.org](http://www.scfhs.org)), formative assessment will have the following features which will be used based on the Miller's pyramid (appendix) :

- a. Multisource: minimum four tools.
- b. Comprehensive: covering all learning domains (knowledge, skills, and attitude).
- c. Relevant: focusing on workplace-based observations.
- d. Competency-milestone oriented: reflecting trainee's expected competencies that matches trainee's developmental level.

Trainees should play an active role seeking feedback during their training.

On the other hand, trainers are expected to provide timely and formative assessment.

SCFHS will provide an e-portfolio system to enhance communication and analysis of data arising from formative assessment.

Trainers and trainees are directed to follow the recommendations of the scientific council regarding the updated forms, frequency, distribution, and deadlines related to the implementation of evaluation forms.

## 2.2 Formative Assessment Tools

Learning Domain	Formative Assessment Tools	Important details ( e.g frequency , specifications related to the tool)
Knowledge	<ol style="list-style-type: none"> <li>1. Structured Oral Exam (SOE)</li> <li>2. Annual Written Progress Test (Local or International)</li> <li>3. Structured Academic Activates Case Based Discussion (CBD)</li> </ol>	<ol style="list-style-type: none"> <li>1- SOE: in the final examination after completion of two years</li> <li>2- The annual training progress test is performed annually by the training center</li> <li>3- Every rotation CBD: two per month</li> </ol>
Skills	<ol style="list-style-type: none"> <li>1. OSCE: Objective structured clinical examination</li> <li>2. Log Book</li> <li>3. DOPS: Direct Observation for Procedural Skills</li> <li>4. Mini-CEX: mini-Clinical Evaluation Exercise</li> <li>5. Research Activities Volunteer Activities</li> </ol>	<ol style="list-style-type: none"> <li>1- OSCE: in the final examination after completion of the two years training</li> <li>2- By the end of each training year</li> <li>3- During the performance of a procedure</li> <li>4- Mini-CEX: twice per year</li> <li>5- Once per year Once per the two training years</li> </ol>
Attitude	ITER: In-Training Evaluation Report	By the end of each rotation

The evaluation of each component will be based on the following equation:

Percentage	< 50%	50-59.4%	60-69.4%	>70%
Description	Clear fail	Borderline fail	Borderline pass	Clear pass

To achieve unconditioned promotion, the candidate must score a minimum of “borderline pass” in all five components.





- The program director can still recommend the promotion of candidates if the above is not met in some situations:
- In case the candidate scored “borderline failure” in one or two components at maximum, and these scores should not belong to the same area of assessment (for example: both borderline failures should not belong both to skills)
- The candidate must have passed all other components and has scored a minimum of clear pass in at least two components.

## 3. Summative Assessment

### 3.1 General Principles

Summative assessment is the component of assessment that aims primarily to make informed decisions on trainees’ competency. In comparison to the formative one, summative assessment does not aim to provide constructive feedback. For further details on this section please refer to general bylaws and executive policy of assessment (available online: [www.scfhs.org](http://www.scfhs.org)).

In order to be eligible to set for the final exams, a trainee should be granted “*Certification of Training-Completion*” which will only be issued to the fellow upon successful fulfillment of all program requirements

### 3.2 Promotion Examination (If Applicable)

It is a written exam that permit the fellow to be promoted from “F1” to “F2” level of training.

The exam is set-up by the endocrine scientific committee

For detail in passing score and items refer to the updated policy of SCFHS

### 3.3 Final Examinations

Final specialty examination is the summative assessment component that grant trainees the specialty’s certification. It has two elements:

1. Final written exam: in order to be eligible for this exam, trainees are required to have “*Certification of Training-Completion*”.

2. Final clinical/practical exam: Trainees will be required to pass the final written exam in order to be eligible to set for the final clinical/practical exam.

Learning Domain	Summative Assessment Tools	Passing Score
Knowledge	Promotion Written Examination Final Written Examination	At least borderline pass in each tool in accordance with the standard setting method used by the executive administration of assessment
Skills	Objective Structured Clinical Examinations (OSCE) Structured Oral Examinations (SOE)	At least borderline pass in each tool in accordance with the standard setting method used by the executive administration of assessment
Attitude	FITER: In-Training Evaluation Report	Successfully pass FITER

### Final Written Examination Blueprint:

No.	SECTIONS	TOTAL REQUIRED ITEMS	COGNITION		DOMAINS			
			K1	K2	ASSESSMENT/DIAGNOSIS	MANAGEMENT	DATA INTERPRETATION	PROFESSIONAL BEHAVIORS
1	Adrenal Disorders	10						
2	Pituitary Disorders	10						
3	Lipids, Obesity, and Nutrition	10						
4	Diabetes Mellitus (DM2)	12						
5	Diabetes Mellitus (DM1)	8						
6	Gestational DM	4						
7	Calcium and Bone Disorders	12						
8	Thyroid Disorders	14						
9	Reproduction (female 50% and male 50%)	10						
10	Research, Ethics and Professionalism and Patient Safety	10						
	Total	100						



		DIMENSIONS OF CARE				
		Health Promotion & Illness Prevention	Acute	Chronic	Psychosocial Aspects	# Stations
DOMAINS FOR INTEGRATED CLINICAL ENCOUNTER	Patient Care	1	2	4		7
	Patient Safety & Procedural Skills		1			1
	Communication & Interpersonal Skills				1	1
	Professional Behaviors			1		1
	Total Stations	1	3	5	1	10

### Final Clinical Examination Blueprint

The “Communication, Interpersonal Skills, Professional Behaviors and patient Safety” can be integrated within the patient care.

### Eligibility

1. Successful completion of the required period of fellowship training (two years).
2. Possession of “*Certification of Training-Completion*”
3. Achieve a minimum of **Borderline Pass** in each assessment tool
4. Registered for the examination at least one month before the exam date.

**Passing score:** refer to the updated policy and procedure of the SCFHS

**Certification:** refer to the updated policy and procedure of the SCFHS

### Suggested learning resources

Fellows are requested to use major textbooks and electronic resources suggested by the faculty.

These include:

1. Endocrinology textbooks (Williams)
2. Greenspan's Basic & Clinical Endocrinology

3. Oxford Textbook of Endocrinology and Diabetes
4. UpToDate
5. Practice guidelines of the American Diabetes Association (<http://www.diabetes.org>)
6. Practice guidelines of the American Association of Clinical Endocrinologists (<http://www.AACE.com>)
7. The Endocrine Society (<http://www.endo-society.org>)
8. The European Association for the Study of Diabetes (<http://www.EASD.com>)

Fellows are encouraged to read monthly

1. The Journal of Clinical Endocrinology and Metabolism
2. Endocrine Reviews
3. Diabetes
4. Diabetes Care
5. Diabetes Reviews
6. The Journal of Clinical Investigation
7. Others depending on their specific interests



---

## XII. PROGRAM AND COURSES EVALUATION

---

SCFHS will apply variable measures to evaluate the implementation of this curriculum. Training outcomes of this program will undergo the quality assurance framework endorsed by the Central Training Committee at SCFHS. Trainees assessment (both formative and summative) results will be analyzed and mapped to curriculum content. Other indicators that will be incorporated are:

- Report of the annual trainees' satisfaction survey.
- Reports from trainees' evaluation of faculty members.
- Reports from trainees' evaluation of rotations.
- Reports from the annual survey of program directors.
- Data available from program accreditations.
- Reports from direct field communications with trainees and trainers.

Goal Based Evaluation; the intended milestones achievement will be evaluated at the end of each stage to assess the progress of the curriculum delivery, and any deficiency will be addressed in the following stage utilizing the time devoted for trainee-selected topics and professional session.

In addition to subject-matter opinion, best practices from benchmarked international programs, SCFHS will apply a robust method to ensure that this curriculum will utilize all the data that will be available during the time of revising this curriculum in the future.

---

## XIII. POLICIES AND PROCEDURES

---

This curriculum represents the means and materials outlining learning objectives with which trainees and trainers will interact for the purpose of achieving the identified educational outcomes. Saudi Commission for Health Specialties (SCFHS) has a full set of “General Bylaws” and “Executive Policies” (published on the official SCFHS website) that regulate all processes related to training. General bylaws of training, assessment, and accreditation as well as executive policies on: admission, registration, continuous assessment and promotion, examination, trainees’ representation and support, duty hours, and leaves are examples of regulations that need to be applied. Trainees, trainers, and supervisors need to apply this curriculum in compliance with the most updated bylaws and policies which can be accessed online (via the official SCFHS website).



# XIV. APPENDICES

- A. F1 Competency-Matrix
- B. F2 Competency-Matrix
- C. Universal Topics Modules
- D. Top Conditions and procedures in the Specialty
- E. Examples of Formative Assessment Tools
- F. Glossary
- G. References

## Appendix A

### F1 Core Clinical Problems (Detailed Mapping) Example

#### Competency: Hyperthyroidism

COMPETENCIES: HYPERTHYROIDISM MEDICAL EXPERT	COMMUNICATOR	COLLABORATOR	LEADER	HEALTH ADVOCATE	SCHOLAR	PROFESSIONAL
1) Show skills in obtaining history relevant to hyperthyroidism, focusing on: <ul style="list-style-type: none"> <li>a. Symptoms (A)</li> <li>b. Etiology, particularly Graves' disease(C)</li> <li>c. Any comorbidity as a consequence of untreated hyperthyroidism, such as AF, CHF etc. (C)</li> </ul> 2) Conduct physical examination of: <ul style="list-style-type: none"> <li>a. Clinical signs of hypothyroidism (A)</li> <li>b. Examination of thyroid gland (C)</li> <li>c. Examination of eyes</li> <li>d. Any complications such as AF, CHF (M)</li> </ul>	1) Share the findings, differential diagnosis, and management plan with the patient and his/her family in a compassionate way, respecting and identifying their concerns and autonomy (A) 2) Discuss with patient the different modalities of ablative treatment, namely, RAI and surgery, and their advantages and disadvantages (C) 3) Educate the patient on what to do if missing a dose	1) Liaise effectively with nuclear medicine specialist in case of RAI treatment and surgeon in case the patient plans to go for thyroidectomy (C)	1) Use investigations of thyroid nodule in a cost-efficient way 2) Utilize evidence-based care for patients with thyroid nodules and thyroid cancer	Participate in public education about thyroid nodules and thyroid cancer	1). Reading peer review thyroid journals 2) Update knowledge on management of hyperthyroidism 3) Develop patient educational material in appropriate, simple language addressing what hyperthyroidism is, its causes, how to treat it, advantages and disadvantages of medical treatment, RAI and surgery, how to prevent complications of hyperthyroidism and what to do if the patient develops fever while taking anti-thyroid medications	1) Use high ethical standards in collaboration with colleagues and communication with the patient and family 2) Respond to emerging patient issues promptly such as if the patient comes without an appointment because he/she developed fever while on anti-thyroid medication

<p>e. Identification of features of impending thyroid storm</p> <p>3) Compose differential diagnosis and management plan (C)</p> <p>4) Request baseline laboratory and radiology workup (A)</p> <p>5) Plan immediate management</p> <p>6) Plan long-term management, endorsing ablative treatment such as RAI or thyroidectomy (C)</p> <p>7) Arrange timely follow-up and continuity of care (C)</p> <p>8) Manage thyroid storm</p>	<p>4) Educate women of childbearing age on dose adjustment and monitoring during pregnancy (C)</p> <p>2) Encourage the patient and family to reveal their concerns and ask questions to assist them to share decision-making (A)</p>					
---	--	--	--	--	--	--

Key: A—assumed; C—core specialty level; M—mastery level





# Appendix B

## F2 Core Clinical Problems (Detailed Mapping) Example

### Competency: Thyroid Nodule

MEDICAL EXPERT	COMMUNICATOR	COLLABORATOR	LEADER	HEALTH ADVOCATE	SCHOLAR	PROFESSIONAL
<p>1) Show proficiency in obtaining history relevant to thyroid nodule, focusing on:</p> <ol style="list-style-type: none"> <li>risk factors for malignancy (C)</li> <li>compression (A)</li> <li>thyroid functional status (A)</li> </ol> <p>2) Conduct physical examination of:</p> <ol style="list-style-type: none"> <li>Thyroid nodule: multiple or single, consistency, adhesion to surrounding tissue, any pressure signs, any lymph nodes (C)</li> <li>Assessment of thyroid function (hypo, hyper or euthyroid) (A)</li> <li>Signs of other signs indicating MEN (M)</li> </ol> <p>3) Compose differential diagnosis and management plan (C)</p> <p>4) Request baseline laboratory and radiology workup (A)</p> <p>5) Request ultrasound and FNA based on evidence-based guideline for thyroid nodule (ES, ATA, AACE, EES) (M)</p> <p>6) Obtain informed consent for FNA (A)</p> <p>7) Plan for surgery if the result of FNA is malignant or suspicious (M)</p> <p>8) Arrange for follow-up and continuity of care (C)</p>	<p>1) Share the finding, differential diagnosis, and management plan with the patient and his/her family in a compassionate way, respecting and identifying their concerns and autonomy (A)</p> <p>2) Encourage the patient and family to reveal their concerns and ask questions to assist them to share decision-making (A)</p>	<p>1) Liaise effectively with radiologist, cytopathologist (A)</p> <p>2) if the result of FNA is suspicious or malignant, arrange referral to surgery using professional written and verbal communication to assure safe handover</p> <p>3) Liaise effectively with radiooncologist for RAI therapy for papillary and follicular thyroid cancer</p> <p>4) Liaise effectively with radiooncologist and oncologist for other types of thyroid cancer or metastatic disease</p>	<p>1) Cost-efficiently apply investigations of thyroid nodule</p> <p>2) Utilize evidence-based care for patients with thyroid nodules and thyroid cancer</p>	<p>Participate in public education about thyroid nodules and thyroid cancer</p>	<p>1). Update knowledge on the management of thyroid nodules</p> <p>2). Update knowledge on management of thyroid cancer and epidemiology of thyroid cancer in Saudi Arabia</p>	<p>Use high ethical standards in collaboration with colleagues and communication with the patient</p>

Key: A—assumed; C—core specialty level; M—mastery level

# Appendix C

## Module 1: Introduction

1. Safe Drug Prescribing: At the end of the learning unit, you should be able to do the following:
  - Recognize the importance of safe drug prescribing in healthcare.
  - Describe the various adverse drug reactions with examples of commonly prescribed drugs that can cause such reactions.
  - Apply principles of drug-drug interactions, drug-disease interactions, and drug-food interactions into common situations.
  - Apply principles of prescribing drugs in special situations, such as renal failure and liver failure.
  - Apply principles of prescribing drugs in elderly, pediatrics age group patients, and in pregnancy and lactation.
  - Promote evidence-based cost-effective prescribing.
  - Discuss ethical and legal framework governing safe-drug prescribing in Saudi Arabia.

## Module 2: Diabetes and Metabolic Disorders

1. Recognition and Management of Diabetic Emergencies
2. Management of Diabetic Complications
3. Comorbidities of Obesity

1. **Recognition and Management of Diabetic Emergencies:** At the end of the learning unit, you should be able to do the following:
  - Describe pathogenesis of common diabetic emergencies, including their complications.
  - Identify risk factors and groups of patients vulnerable to such emergencies.
  - Recognize a patient presenting with diabetic emergencies. Institute immediate management.
  - Refer the patient to the appropriate next level of care.
  - Counsel patient and families to prevent such emergencies.



2. **Management of Diabetic Complications:** At the end of the learning unit, you should be able to do the following:
  - Describe the pathogenesis of important complications of Type 2 diabetes mellitus.
  - Screen patients for such complications.
  - Provide preventive measures for such complications.
  - Treat such complications.
  - Counsel patients and families with special emphasis on prevention.
3. **Comorbidities of Obesity:** At the end of the learning unit, you should be able to do the following:
  - Screen patients for the presence of common and important comorbidities of obesity.
  - Manage obesity-related comorbidities.
  - Provide dietary and life-style advice for prevention and management of obesity.

## Module 3: Medical and Surgical Emergencies

1. **Management of Hypotension and Hypertension:** For this, the following learning outcomes apply.
  - At the end of the learning unit, you should be able to do the following:
    - Triage and categorize patients.
    - Identify patients who need prompt medical and surgical attention.
    - Generate a preliminary diagnoses-based history and physical examination.
    - Order and interpret urgent investigations.
    - Provide appropriate immediate management to patients.
    - Refer the patients to the next level of care, if needed.

## Module 4: Acute Care

Pre-Operative Assessment

Post-Operative Care

Management of Fluid in the Hospitalized Patients

Management of Electrolyte Imbalances

1. **Pre-Operative Assessment:** At the end of the learning unit, you should be able to do the following:
  - Describe the basic principles of pre-operative assessment.
  - Perform pre-operative assessment on an uncomplicated patient with special emphasis on the following:
    - General health assessment
    - Medications and medical device assessment
    - Drug allergy
  - Categorize patients according to risks.
2. **Post-Operative Care:** At the end of the learning unit, you should be able to do the following:
  - Devise a post-operative care plan, including monitoring of vitals, fluid management, medications, and laboratory investigations.
  - Hand-over the patients properly to the appropriate facilities.
  - Identify common post-operative complications.
  - Monitor patients for possible post-operative complications.
  - Institute immediate management for post-operative complications.
3. **Management of Fluid in Hospitalized Patients:** At the end of the learning unit, you should be able to do the following:
  - Review the physiological basis of water balance in the body.
  - Assess a patient for his/her hydration status.
  - Recognize a patient with over and under hydration.
  - Order fluid therapy (oral as well as intravenous) for a hospitalized patient.
  - Monitor fluid status and response to therapy through history, physical examination, and selected laboratory investigations.
4. **Management of Acid-Base Electrolyte Imbalances:** At the end of the learning unit, you should be able to do the following:
  - Review the physiological basis of electrolyte and acid-base balance in the body.
  - Identify diseases and conditions that are likely to cause or be associated with acid/base and electrolyte imbalances.
  - Correct electrolyte and acid-base imbalances.
  - Perform careful calculations, checks, and other safety measures while correcting acid-base and electrolyte imbalances.



- Monitor responses to therapy through history, physical examination, and selected laboratory investigations.

## Module 5: Frail Elderly

### Assessment of Frail Elderly

### Prescribing Drugs in the Elderly

### Care of the Elderly

1. **Assessment of Frail Elderly:** At the end of the learning unit, you should be able to do the following:
  - Enumerate the differences and similarities between comprehensive assessment of the elderly and assessment of other patients.
  - Perform comprehensive assessment, in conjunction with other members of the health care team, of frail elderly persons with a special emphasis on social factors, functional status, quality of life, diet and nutrition, and medication history.
  - Develop a problem list based on the assessment of the elderly.
2. **Prescribing Drugs in the Elderly:** At the end of the learning unit, you should be able to do the following:
  - Discuss the principles of prescribing in the elderly.
  - Recognize poly-pharmacy, prescribing cascade, inappropriate dosages, inappropriate drugs, and deliberate drug exclusion as major causes of morbidity in the elderly.
  - Describe the physiological and functional declines in the elderly that contribute to increased drug-related adverse events.
  - Discuss drug interactions and drug-disease interactions among the elderly.
  - Develop a rational prescribing habit for the elderly.
  - Counsel elderly patients and family on safe medication usage.
3. **Care of the Elderly:** At the end of the learning unit, you should be able to do the following:
  - Describe the factors that need to be considered while planning care for the elderly.
  - Recognize the needs and wellbeing of caregivers.

- Identify the local and community resources available in the care of the elderly.
- Develop, with inputs from other health care professionals, individualized care plan for an elderly patient.

## Module 6: Ethics and Healthcare

### Occupational Hazards of HCW

### Evidence-based Approach to Smoking Cessation

### Patient Advocacy

### Ethical Issues: Transplantation/Organ Harvesting; Withdrawal of Care Ethical Issues: Treatment

### Refusal; Patient Autonomy

### Role of Doctors in Death and Dying

1. **Occupation Hazards of Health Care Workers (HCW):** At the end of the learning unit, you should be able to do the following:
  - Recognize common sources and risk factors of occupational hazards among the HCW.
  - Describe common occupational hazards in the workplace.
  - Develop familiarity with legal and regulatory frameworks governing occupational hazards among the HCW.
  - Develop a proactive attitude to promoting workplace safety.
  - Protect yourself and colleagues against potential occupational hazards in the workplace.
2. **Evidence-based Approach to Smoking Cessation:** At the end of the learning unit, you should be able to do the following:
  - Describe the epidemiology of smoking and tobacco usage in Saudi Arabia.
  - Review the effects of smoking on the smoker and family members.
  - Effectively use pharmacologic and non-pharmacologic measures to treat tobacco usage and dependence.
  - Effectively use pharmacologic and non-pharmacologic measures to treat tobacco usage and dependence among special population groups, such as pregnant women, adolescents, and patients with psychiatric disorders.



3. **Patient Advocacy:** At the end of the learning unit, you should be able to do the following:
  - Define patient advocacy.
  - Recognize patient advocacy as a core value governing medical practice.
  - Describe the role of patient advocates in the care of the patients.
  - Develop a positive attitude toward patient advocacy.
  - Be a patient advocate in conflicting situations.
  - Be familiar with local and national patient advocacy groups.
4. **Ethical issues: transplantation/organ harvesting; withdrawal of care:** At the end of the learning unit, you should be able to do the following:
  - Apply key ethical and religious principles governing organ transplantation and withdrawal of care.
  - Be familiar with the legal and regulatory guidelines regarding organ transplantation and withdrawal of care.
  - Counsel patients and families in the light of applicable ethical and religious principles.
  - Guide patients and families to make informed decisions.
5. **Ethical issues: treatment refusal; patient autonomy:** At the end of the learning unit, you should be able to do the following:
  - Predict situations where a patient or family is likely to decline prescribed treatment.
  - Describe the concept of “rational adult” in the context of patient autonomy and treatment refusal.
  - Analyze key ethical, moral, and regulatory dilemmas in treatment refusal.
  - Recognize the importance of patient autonomy in the decision-making process.
  - Counsel patients and families declining medical treatment in light of the patients’ best interests.
6. **Role of Doctors in Death and Dying:** At the end of the learning unit, you should be able to do the following:
  - Recognize the important role a doctor can play during a dying process.
  - Provide emotional as well as physical care to a dying patient and family. Provide appropriate pain management in a dying patient.
  - Identify suitable patients and refer patients to palliative care services

## Appendix D

### Top Conditions and procedures in Endocrinology

#### Case Discussions; Interactive Lectures (half day suggested topic) Table -1

Core Endocrine Topics: Case Discussions; Interactive Lectures Topic	Comments
Prevention and management of diabetic complications	
Approach to patients with short stature	



Approach to patients with delayed puberty	
Approach to patients with amenorrhea	
Approach to male patients with hypogonadism	
Approach to patients with thyroid nodules	
Approach to patients with hypocalcemia	
Approach to patients with hypercalcemia	
Managing patients after bariatric surgery	
Approach and workup of hypoglycemia in non-diabetic patients	
Approach and workup of hyperprolactinemia	
Approach to patients with thyroid nodules	
Workup of adrenal incidentaloma	
Workup of pituitary incidentaloma	
Endocrine hypertension	
Electrolyte and fluid imbalance	
Endocrine causes of polyuria and polydipsia	
Approach to patients with skeletal and connective tissue disorders	
Workup for Endocrinopathies in childhood cancer survivors	
Endocrine approach to obesity	
Approach and workup of patients with osteoporosis	
Management of diabetic ketoacidosis	
Management of other endocrine emergencies	
Management of postmenopausal osteoporosis	
Management of postmenopausal osteoporosis	
Management of neuroendocrine tumor	
Management of functional pituitary tumor	



## Workshops/Simulation Topics Table-2

Core Endocrine Topics: Workshops/Simulation Topics	Comments
Insulin pump	
Continuous glucose monitoring system	
Ultrasound thyroid	
Thyroid FNA	
Lipophoresis	
DXA scan interpretation	

## Procedures Performed in Endocrinology Table-3

#	Procedures
1	Short Synacthen Test
2	GH stimulation tests
3	72 hours fasting test.
4	Mixed meal test
5	Thyroid Ultrasound
6	FNA thyroid
7	Zoledronic acid (Aclasta) IV infusion
8	Radioactive iodine ablation for PTC
9	DXA scan (BMD)
10	Adrenal venous sampling (AVS)

## List of Dynamic Endocrine Testing Items Table - 4

<p><b>Cortisol deficiency</b>  <b>ACTH stimulation test (Synacthen)</b></p> <ol style="list-style-type: none"> <li>Rapid- (short-) acting ACTH               <ol style="list-style-type: none"> <li>Standard (250 mcg)</li> <li>Low dose (1 mcg)</li> <li>Long-acting ACTH stimulation test</li> </ol> </li> <li>Metyrapone test</li> </ol>	<p><b>Combined pituitary function test</b></p> <ol style="list-style-type: none"> <li>Arginine HC + TRH + GnRH + Synacthen</li> <li>Glucagon + TRH + GnRH + Synacthen</li> <li>GHRH + arginine HCL test</li> <li>GHRH/GHRP test</li> <li>CRF + BIPSS</li> <li>Vasopressin + CRF + BIPSS</li> <li>Dexamethasone + CRH test</li> </ol>
---	--

<p><b>Cortisol excess</b></p> <ol style="list-style-type: none"> <li>1. Dexamethasone suppression test             <ol style="list-style-type: none"> <li>a. Overnight 1 mg</li> <li>b. Low dose</li> <li>c. High dose</li> </ol> </li> <li>2. CRH (CRF) test</li> <li>3. Vasopressin/desmopressin stimulation test</li> </ol>	<p><b>Adrenal</b></p> <p><b>CAH</b></p> <ol style="list-style-type: none"> <li>1. Standard dose ACTH stimulation test</li> </ol> <p><b>Aldosteronism</b></p> <ol style="list-style-type: none"> <li>1. Saline loading test</li> <li>2. Oral salt loading test</li> </ol>
<p><b>Cortisol and GH</b></p> <ol style="list-style-type: none"> <li>1. Insulin tolerance test</li> </ol>	<p><b>Gonads:</b></p> <ol style="list-style-type: none"> <li>1. GnRH (gonadorelin) test</li> <li>2. hCG test</li> </ol>
<p><b>GH deficiency</b></p> <p><i>Pharmacologic tests</i></p> <ol style="list-style-type: none"> <li>1. Glucagon stimulation test</li> <li>2. Arginine HCL test</li> <li>3. GHRH test</li> <li>4. Clonidine stimulation test</li> <li>5. L-DOPA stimulation test</li> </ol> <p><i>Physiologic tests</i></p> <ol style="list-style-type: none"> <li>1. Exercise GH stimulation test</li> <li>2. Post sleep GH stimulation test</li> </ol>	<p><b>Diabetes</b></p> <ol style="list-style-type: none"> <li>1. 75 g 2-h OGTT</li> </ol> <p><b>GDM</b></p> <ol style="list-style-type: none"> <li>1. 50 g challenge test</li> <li>2. 75 g 2-h OGTT</li> <li>3. 100 g 3-h OGTT</li> </ol> <p><b>Hypoglycemia</b></p> <ol style="list-style-type: none"> <li>1. 72-hour fasting protocol</li> <li>2. Prolonged OGTT</li> <li>3. Mixed meal test</li> <li>4. Intra-arterial calcium stimulation test</li> </ol> <p><b>Insulin secretion and resistance</b></p> <ol style="list-style-type: none"> <li>1. Glucagon stimulation test for C-peptide</li> <li>2. OGTT</li> <li>3. IVGTT</li> <li>4. Glucose clamp technique</li> </ol>
<p><b>GH excess</b></p> <ol style="list-style-type: none"> <li>1. OGTT GH suppression test</li> </ol>	<p><b>Parathyroid:</b></p> <ol style="list-style-type: none"> <li>1. PTH stimulation test</li> </ol>
<p><b>Thyroid</b></p> <p><b>TSH</b></p> <ol style="list-style-type: none"> <li>1. TRH test</li> <li>2. Octreotide test             <ol style="list-style-type: none"> <li>a. Rapid</li> <li>b. Prolonged</li> </ol> </li> </ol> <p><b>C Cell</b></p> <ol style="list-style-type: none"> <li>1. Pentagastrin test</li> <li>2. Calcium infusion test</li> </ol>	<p><b>Diabetes insipidus</b></p> <ol style="list-style-type: none"> <li>1. Water deprivation tests</li> <li>2. DDAVP challenge test</li> </ol>



# Appendix-E



## IN-TRAINING EVALUATION REPORT - INTERNAL MEDICINE RESIDENCY TRAINING PROGRAM

Center: \_\_\_\_\_ Residency level: \_\_\_\_\_  
 Name: \_\_\_\_\_ Registration number: \_\_\_\_\_  
 Rotation: \_\_\_\_\_ Period: \_\_\_\_\_

IT IS MANDATORY THAT THIS EVALUATION BE DISCUSSED WITH THE TRAINEE PRIOR TO THE END OF THE ROTATION.

Roles /Competencies	Clear Fail (1)	Borderline (2)	Clear Pass (3)	Exceeds Expectation (4)	N/A
<b>A. MEDICAL EXPERT</b>					
History & Physical Examination:					
1. Comprehensive, accurate & concise with all relevant details					
Diagnostic Tests:					
2. Used in a cost-effective manner & understands limitations & predictive value					
Clinical Decision:					
3. Able to formulate appropriate differential diagnosis.					
4. Able to analyze, integrate, and formulate effective management strategies.					
Medical Knowledge:					
5. Broad Clinical & Basic knowledge of a wide variety of medical problems and develops a plan of secondary prevention.					
Emergency Management:					
6. Able to identify and respond appropriately to urgent cases.					
Evidence-based Practice/Critical Appraisal Skills:					
7. Aware of the role of evidence in clinical decision-making.					
8. Able to apply relevant information to problem-solving.					
9. Demonstrates knowledge of medications used, mechanisms of action, clinically relevant pharmacokinetics, indications, contraindications, and adverse effects.					
Procedural Skills:					
10. Perform diagnostic & therapeutic procedures, understands indications, limitations & complications					
<b>B. COMMUNICATOR</b>					
11. Communicates effectively with patients, their families, and HCPs.					
12. Able to maintain clear, accurate & appropriate records.					
13. Written orders and progress notes are well organized & legible.					
14. Discharge Summaries are concise & completed promptly.					
<b>C. COLLABORATOR:</b>					
15. Works effectively in a team environment with attending, juniors & nursing staff					
<b>D. MANAGER</b>					
16. Serves in administration and leadership roles as appropriate.					
17. Appropriate & efficient use of health care resources.					
<b>E. SCHOLAR</b>					
18. Attends and contributes to rounds, seminars and other learning events.					
19. Accepts and acts on constructive feedback.					
20. Contributes to the education of patients, junior residents, house staff, and students					
21. Contributes in scientific research.					
<b>F. HEALTH ADVOCATE:</b>					
22. Able to identify the psychosocial, economic, environmental & biological factors which influence the health of patients and society.					
23. Offers advocacy on behalf of patients at practice and general population levels.					
<b>G. PROFESSIONAL</b>					
24. Delivers the highest quality care with integrity, honesty & compassion. Recognizes limitations and seeks advice and consultation when necessary.					
25. Reflects the highest standards of excellence in clinical care and ethical conduct.					
<b>Total Score</b>					

Total Score: \_\_\_\_\_ =  $\frac{\quad}{24}$  x 25 = \_\_\_\_\_ %

Evaluator name (1): \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Evaluator name (2): \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Evaluator name (3): \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Comments: \_\_\_\_\_

Fellow Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Chairperson, Postgraduate Department: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Director, Postgraduate & Scholarship Admin.: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_





## Appendix-E

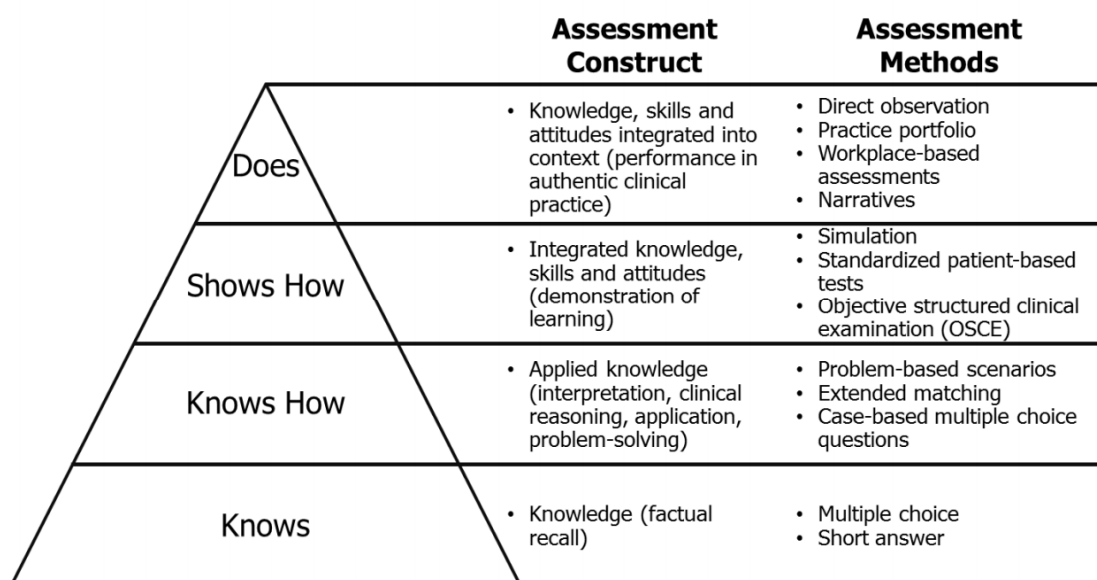
### List of Formative Assessment Tools

(according to executive policy on continuous assessment, minimum of 4 tools are needed, should cover the three domains, trainee should show competency in each assessment tool in order to be promoted to the subsequent training level; for further details please refer to the policy on [www.scfhs.org](http://www.scfhs.org))

Learning Domain	Formative Assessment Tools	Important details ( e.g frequency , specifications related to the tool)
Knowledge	<ol style="list-style-type: none"> <li>1- Structured Oral Exam (SOE)</li> <li>2- Annual Written Progress Test (Local or International)</li> <li>3- Structured Academic Activates</li> <li>4- Case Based Discussion (CBD)</li> </ol>	<ol style="list-style-type: none"> <li>1- SOE: in the final examination after completion of two years</li> <li>2- The annual training progress test is performed annually by the training center</li> <li>3- Every rotation</li> <li>4- CBD: two per month</li> </ol>
Skills	<ol style="list-style-type: none"> <li>1- OSCE: Objective structured clinical examination</li> <li>2- Log Book</li> <li>3- DOPS: Direct Observation for Procedural Skills</li> <li>4- Mini-CEX: mini-Clinical Evaluation Exercise</li> <li>5- Research Activities</li> <li>6- Volunteer Activities</li> </ol>	<ol style="list-style-type: none"> <li>6- OSCE: in the final examination after completion of the two years training</li> <li>7- By the end of each year training</li> <li>8- During the performance of a procedure</li> <li>9- Mini-CEX: twice per year</li> <li>10- Once per year</li> <li>11- Once per the two year training</li> </ol>
Attitude	<ol style="list-style-type: none"> <li>1- ITER: In-Training Evaluation Report</li> </ol>	<ol style="list-style-type: none"> <li>1- By the end of each rotation</li> </ol>

## Appendix F

Miller’s Pyramid of Assessment provides a framework for assessing the trainees’ clinical competences which acts a road map for the trainers to select the assessment methods to target different clinical competencies including “knows,” “knows how,” “shows how,” and “does” (2).



(figure1: Miller’s Pyramid)

1. Adapted from: Walsh CM. In-training gastrointestinal endoscopy competency assessment tools: types of tools, validation and impact. *Best Practice & Research Clinical Gastroenterology*. 2016 Jun 1;30(3):357-74.
2. Miller GE. The assessment of clinical skills/competence/performance. *Acad Med*. 1990;65(9 Suppl): S63–7.



# Appendix-G

## Glossary

Glossary	
Blueprint	Description correlating educational objectives with assessment contents. For example, test blueprint defines the proportion of test questions allocated to each learning domain and/or content.
Competency	Capability to function within a defined professional role that implies entrustment of a trainee by graduation of the program with the required knowledge, skills, and attitude needed to practice unsupervised.
Specialty Core Content (skills, knowledge, and professional attitude)	A specific knowledge or skill or professional attitude that is specific and integral to the given specialty.
Formative assessment	An assessment that is used to inform the trainer and learner of what has been taught and learned, respectively, for the purpose of improving learning. Typically, the results of formative assessment are communicated through feedback to the learner. Formative assessments are not intended primarily to make judgments or decisions (though it can be as a secondary gain).
Mastery	Exceeding the minimum level of competency to the proficient level of performance indicating rich experience with possession of great knowledge, skills, and attitude.
Portfolio	A collection of evidence of progression towards competency. It may include both constructed components (defined by mandatory continuous assessment tools in curriculum) and unconstructed components (selected by the learner).
Summative assessment	An assessment that describes the composite performance of the development of a learner at a particular point in time and is used to inform judgment and make decisions about the level of learning and certification.
Universal Topic	A knowledge, skills, or professional behavior that is not specific to the given specialty but universal for the general practice of a given healthcare profession.

## Appendix-G

References: “CanMeds 2015”

<http://www.royalcollege.ca/rcsite/documents/canmeds/canmeds-full-frame>





## References

---

- <sup>1</sup> KSA General Authority of Statistics Demographic Survey 2016
- <sup>2</sup> World Population Prospect: The 2015 Revision Volume II-Demographic Profile
- <sup>3</sup> World Health Statistics 2016: Monitoring Health for SDGs
- <sup>4</sup> WHO Global Status Report on NCDs 2015
- <sup>5</sup> Mansour M. Al-Nozha, Mohammed A. Al-Maatouq, Yaqoub Y. Al-Mazrou, Saad S. Al-Harhi, Mohammed R. Arafah, Mohamed Z. Khalil, Nazeer B. Khan, Akram Al-Khadra, Khalid Al-Marzouki, Mohammed S. Nouh, Moheeb Abdullah, Omer Attas, Maie S. Al-Shahid, Abdullellah Al-Mobeireek. Diabetes mellitus in Saudi Arabia. Saudi Med J 2004;25 (11):1603-1610
- <sup>6</sup> Nasser M. Al-Daghri, Omar S. Al-Attas, Majed S. Alokail, Khalid M. Alkharfy, Mansour Yousef, Shaun Louie Sabico, George P Chrousos. Diabetes mellitus type 2 and other chronic non-communicable diseases in the central region, Saudi Arabia (Riyadh cohort 2): a decade of an epidemic. BMC Med 2011;9:76
- <sup>7</sup> Charbel El Bcheraoui, Mohammed Basulaiman, Marwa Tuffaha, Farah Daoud, Margaret Robinson, Sara Jaber, Sarah Mikhitarian, et al. Status of the diabetes epidemic in the Kingdom of Saudi Arabia, 2013. Int J Public Health 2014;59(6):1011-1021
- <sup>8</sup> Ziad A. Memish, Charbel El Bcheraoui, Marwa Tuffaha, Margaret Robinson, Farah Daoud, Sara Jaber, Sarah Mikhitarian, Mohammed Al Saeedi, Mohammad A. AlMazroa, Ali H. Mokdad, Abdullah A. Al Rabeeah,. Obesity and associated factors—Kingdom of Saudi Arabia, 2013. Prev Chronic Dis 2014;11:140236.
- <sup>9</sup> Abdulaziz F. Al-Kaabba, Nasser A. Al-Hamdan, Ahmed El Tahir, Abdelshakour M. Abdalla, Abdalla A. Saeed, Muaawia A. Hamza. Prevalence and correlates of dyslipidemia among adults in Saudi Arabia: results from a national survey. Open J Endocr Metab Dis 2012;2:89-97
- <sup>10</sup> M. Basulaiman, C. El Bcheraoui, M. Tuffaha, M. Robinson, F. Daoud, S. Jaber, S. Mikhitarian, S. Wilson, Z. A. Memish, M. Al Saeedi, M. A. AlMazroa, A. H. Mokdad. Hypercholesterolemia and its associated risk factors—Kingdom of Saudi Arabia, 2013. Ann Epidemiol 2014 Aug 20. doi:10.1016/j.annepidem.2014.08.001
- <sup>11</sup> Mahmoud I. El-Desouki. Osteoporosis in postmenopausal Saudi women using dual x-ray bone densitometry. Saudi Med J 2003;24(9):953-956

- 
- <sup>12</sup> M. Salleh M. Ardawi, Abdulraouf A. Maimany, Talal M. Bahksh, Hasan A. N. Nasrat, Waleed A. Milaat, Raja M. Al-Raddadi. Bone mineral density of the spine and femur in healthy Saudis. *Osteoporos Int* 2005;16:43-55
- <sup>13</sup> Fazal Hussain, Samra Iqbal, Asif Mehmood, Shouki Bazarbashi, Tusneem ElHassan, Naeem Chaudhri. Incidence of thyroid cancer in the Kingdom of Saudi Arabia, 2000–2010. *Hematol Oncol Stem Cell Ther* 2013;6(2);58-64
- <sup>14</sup> Omer S. Alamoudi, Suzan M. Attar, Tawfik M. Ghabrah, Mohammad A. Al-Qassimi. Pattern of common diseases in hospitalized patients at a university hospital in Saudi Arabia: a study of 5594 patients. *J King Abdulaziz Univ* 2009;16(4):3-12
- <sup>15</sup> MOH Health Statistical Yearbook 1436