الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Pediatric Endocrinology Fellowship Curriculum

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2020


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ACKNOWLEDGMENTS

Special thanks to the Pediatric Endocrinology Scientific Committee members who participated in the curriculum review.

FOREWORD

In this updated curriculum, we have adopted the Canadian Medical Education Directives for Specialists (CanMEDS) framework, as it is an innovative, competency-based framework which describes the core knowledge, skills, and attitude required of physicians.

This curriculum intends to provide a broad framework for fellows and faculty to focus on teaching and learning as well as clinical experience and professional development during the training program. It does not aim to be the sole source of instructions for defining what is to be taught and learned during the fellowship training. Fellows are expected to acquire knowledge and skills as well as to demonstrate appropriate attitude and behavior throughout their training program and take personal responsibility for their learning. They are expected to learn from every patient encounter irrespective of whether the patient's particular condition or disease is mentioned in this curriculum.

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INTRODUCTION

Context of Practice

Endocrine disorders are relatively common among Saudi children. Hormonal disorders with underlying genetic diseases are particularly high in prevalence. A wide variety of endocrine cases which are significantly different from those in Western countries have been reported in Saudi Arabia and the Gulf region, and high rates of consanguinity and intermarriages have increased the rate of genetic endocrine disorders in these areas.

The Program in the Past

Approximately 20 years ago, two pediatric endocrinology fellowship programs were established. The first was at King Khalid University Hospital, King Saud University, and the second at King Faisal Specialist Hospital and Research Center. A total of approximately 25 pediatric endocrinologists graduated from these two programs. In the last decade, three other hospitals joined this program under the Saudi Commission for Health Specialties (SCFHS) to establish the current joint program. The total number of fellows who successfully completed the training exceeds 50. Some of the graduated fellows have attained a full professor grade and are currently working at different Saudi universities. The training program has been attended by several well-known local, regional, and international pediatric endocrinologists who have served as external visitors or examiners. These visitors and examiners have acknowledged the superior level of the training program and the high quality of the trainees.

The Program at Present

The program duration of two years involves rotations in 10 government hospitals. The training program covers rotations in general pediatric endocrinology, diabetes outpatient clinics, and inpatient services. Further training includes learning modules in medical genetics, endocrine radiology, the laboratory, and research. Participating in research projects is not mandatory according to the current training rules; however, it is strongly recommended that fellows become involved in clinical research or basic science. Almost all government hospitals involved in the training program are affiliated with research centers where fellows can gain exposure to and work with clinical researchers and basic scientists. Several papers resulting from projects in which fellows have participated have been published recently.

During the training, the pediatric endocrine fellows are exposed to different endocrine problems including genetic disorders which result in hormonal imbalances. Program participants are primarily from Saudi Arabia and other Arab Gulf countries. Participants from outside the Gulf region may be considered for inclusion in the near future.

The Program in the Future

The SCFHS Scientific Committee of Pediatric Endocrinology is considering including more hospitals in this program as needed, to provide more opportunities for interested trainees. We may consider further collaboration with well-established international training programs, where fellows can be sent for additional clinical and basic science exposure.

CONTRIBUTORS

Scientific Committee Members

The scientific committee includes the program directors of the following 10 hospitals: King Faisal Specialist Hospital and Research Center, King Khalid University Hospital at King Saud University, National Guard Hospital, King Abdulaziz Medical City at Riyadh, National Guard Hospital, King Abdulaziz Medical City in Jeddah, Prince Sultan Military Medical City, and King Fahad Medical City, King Saud Medical City, King Fahad Military Hospital-Jeddah, Al-Hada Military Hospital-Taif, and Imam Abdulrahman Bin-Faisal University Hospital-Al-Khobar.

Advisory Committee Members

The Joint Pediatric Endocrine Fellowship program committee is planning to include members from other hospitals for advice and contributions.

CURRICULUM OVERVIEW

Process for Curriculum Development

The Joint Pediatric Endocrine Fellowship Program was established several years ago. The current revision of the curriculum aims to standardize the program and to improve the quality of training and learning opportunities. To perform the curriculum revisions, several meetings were conducted at the SCFHS, and several existing international programs were reviewed by three pediatric endocrinologists from different hospitals.

Purpose of the Curriculum

With many changes occurring in the medical field, there is a pressing need for an updated curriculum to help prepare physicians meet the societal needs. The curriculum is considered to be the heart of any learning institution, and curricula are reviewed progressively and systematically to create positive improvements in the educational system.

Differences Between Existing and Proposed Curricula

Some changes have been made in the curriculum to enhance learning, including competency-based assessment, graded responsibilities, better supervisory frameworks, clearer transitions between each training stage, and availability of independent learning within a formal structure. Competencies pertaining to knowledge, skills, and professionalism have been expanded in the proposed curriculum with a greater emphasis on continuous assessment. Additionally, the following changes have been proposed: availability of elective “abroad training”, a compulsory genetic and metabolic rotation, and mandatory completion of a research project. In the proposed curriculum, more details have been added on topics such as continuity clinics, and assessment and evaluation criteria.

FELLOW APPOINTMENTS

Admission/Acceptance Requirements

1. To be admitted to the subspecialty program, the candidate must possess a Saudi Specialty Certificate in General Pediatrics or an equivalent degree recognized by the SCFHS.
2. The candidate must successfully pass the interview for the subspecialty program conducted by the SCFHS Scientific Committee of Pediatric Endocrinology and/or the primary training site.
3. The candidate must provide three letters of recommendation addressed to the program director, from consultants with whom the candidate has recently worked for a minimum duration of three to six months.
4. The candidate must obtain written permission from the primary training site institution permitting him/her to participate on a full-time basis for the entire program duration.
5. The candidate must pay the annual registration fee according to the SCFHS rules and regulations.

Number of Fellows

- The program's educational resources should be adequate to support the number of fellows appointed to the program.
- The program director may not appoint more fellows than the number approved by the SCFHS.
- The minimum requirement is one fellow per training site.
- The number of accepted fellows should not affect the residency training.
- The Fellowship-Training Committee will coordinate the rotation of the fellows between primary sites.

OUTCOMES AND COMPETENCIES

Rationale

The Saudi Board of Pediatric Endocrinology Fellowship Program aims to provide high-level and state-of-the-art clinical training, education, and research in the field of pediatric endocrinology in concordance with international educational standards, to graduate qualified and safe pediatric endocrinologists.

Overall Goal

To graduate pediatric endocrinologists who provide primary and consulting services and are capable of achieving, developing, and carrying out appropriate care for the patient while maintaining a high degree of professionalism and ethical standards in developing patient-physician relationships. The program also aims to provide clinical and initial basic academic training for physicians who intend to pursue academic careers in pediatric endocrinology.

Learning Outcomes

Successful fellows will acquire a broad-based understanding of the principles, philosophy, core knowledge, skills, and attitudes pertaining to pediatric endocrinology. By the end of their training, they should have attained the following goals and objectives:

Trainee Role	Goals and Objectives

Medical Expert	• Function effectively, integrating all of the CanMEDS roles to provide optimal, ethical, and patient-centered medical care
	• Establish and maintain clinical knowledge, skills, and attitudes appropriate to the fellow's level of training
	• Demonstrate competency in taking a focused pediatric endocrine history and performing a complete and appropriate physical examination for treating neonates, infants, children, and adolescents with one of the following disorders:
	  ○ Carbohydrate metabolism disorders
	  ○ Thyroid disorders
	  ○ Pituitary disorders
	  ○ Adrenal disorders
	  ○ Gonadal disorders
	  ○ Mineral disorders
	  ○ Growth disorders
	• Use preventive and therapeutic interventions effectively
	• Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic
	• Seek appropriate consultation from other health professionals when needed

Communicator	• Develop rapport, trust, and ethical therapeutic relationships with patients and families • Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals • Accurately convey relevant information and explanations to patients and families, colleagues, and other professionals • Develop a common understanding of issues, problems, and plans with patients and families, colleagues, and other professionals to develop a shared plan of care • Convey effective oral and written information pertaining to a medical encounter
Collaborator	• Participate effectively and appropriately in an inter-professional healthcare team • Work effectively with other health professionals to prevent, negotiate, and resolve inter-professional conflicts
Health Advocate	• Respond to individual patient health needs and issues as part of patient care • Respond to the health needs of the communities which the fellow serves • Identify the determinants of health of the populations which the fellow serves • Promote the health of individual patients, communities, and populations
Manager	• Participate in activities which contribute to the effectiveness of the healthcare organizations and systems to which the fellow belongs • Manage practice and career effectively • Allocate finite healthcare resources appropriately • Serve in administration and leadership roles, as appropriate
Scholar	• Maintain and enhance professional activities through continuous learning • Critically evaluate information and its sources, and apply this information appropriately to practice decisions • Refine skills for designing hypothesis-driven clinical research • Facilitate the learning of patients, families, students, residents, other health professionals, the public, and others, as appropriate • Develop skills in organizing and delivering lectures on disorders of the endocrine system • Contribute to the creation, dissemination, application, and translation of new medical knowledge and practices
Professional	• Demonstrate a commitment to patients, profession, and society through ethical practice • Demonstrate a commitment to patients, profession, and society through participation in profession-led regulations • Demonstrate a commitment to physician health and sustainable practice

Continuum of Learning

The fellow undergoing training will observe children with a wide variety of endocrine conditions at the training centers. As the pediatric endocrinology fellowship progresses, the fellow will have increasing responsibility in the management of these children. First-year fellows will have primary responsibility for the initial assessment and daily total care of inpatients as well as for the consultation service. These responsibilities will be closely supervised by the on-service consultant. The second-year fellows will have increased responsibility for supervision of other junior fellows, in addition to full-time consultation and daily teaching rounds.

The following section describes in brief, the expected learning which should occur at each key stage of progression within the pediatric specialty. Please note the change in the role of the trainees between the junior (F1) and senior levels (F2)**:**

F1 (Junior)	F2 (Senior)
Obtain fundamental knowledge related to core clinical problems of the specialty. Develop clinical skills such as the ability to perform physical examinations.	Apply knowledge to provide appropriate clinical care related to core clinical problems of the specialty. Analyze and interpret the findings from clinical examinations to develop appropriate differential diagnoses and a management plan for the patient.
Develop clinical skills such as the ability to perform practical procedures related to core presenting problems and procedures such as stimulation testing in pediatric endocrinology.	Analyze and interpret the findings from clinical examinations to develop an appropriate management plan for the patient.
Direct supervision is immediately available.	Independently perform the duties learned at the junior level.
If indirect supervision is provided, such supervision must be consistent with training policies and specific criteria which the junior fellow must meet.	Supervise the routine activities of the junior residents and fellows. Coordinate care for multiple patients on the team assigned.
Examples of tasks which are expected to be performed at the junior level: - Perform history-taking tasks and conduct physical examinations - Order medications and diagnostic tests - Collect and analyze test results - Communicate the test results to the other members of the team and faculty - Obtain informed consent - Perform other stimulation testing	Senior fellows may perform insulin pump initiation and follow-up.
Exhibit dedication to the principles of professional preparation which emphasize primacy of the patient as the focus of care.	Demonstrate continued sophistication in the acquisition of knowledge and skills and enhanced ability to function independently in evaluating patient problems and developing patient care plans.

With the assistance of an assigned mentor or the program director, develop and implement a plan for study, reading, and research of selected topics which promote personal and professional growth and successfully demonstrate the use of literature in dealing with patients.	Respond to consults and learn the elements of an appropriate response to consultation in conjunction with a faculty member.
Communicate with patients and families about the disease process and the plan of care as outlined by the attending physician.	Take a leadership role in teaching the practical aspects of patient care to junior fellows, residents, and medical students. Demonstrate ability to explain complex diagnostic and therapeutic procedures to the patients and families.
Demonstrate adeptness in interpersonal skills needed to handle daily situations.	Demonstrate adeptness in interpersonal skills needed to handle complex situations.
Demonstrate an understanding of the socioeconomic, cultural, and managerial factors inherent in providing cost-effective care.	Demonstrate an understanding of the socioeconomic, cultural, and managerial factors inherent in providing cost-effective care.

Top Core Conditions in the Subspecialty

Top Conditions in Pediatric Endocrinology in Saudi Arabia

A list of top conditions/diseases presented in the three major care sites including the outpatient, emergency room, and inpatient sites, in Saudi Arabia is provided below. The intention is to provide focused training to fellows and to help them identify the diseases and presentations which must be mastered on a priority basis.

Outpatient Referral	Emergency Visits	Inpatient Admissions

• Diabetes mellitus, type 1
• Diabetes mellitus, type 2
• Monogenic and secondary diabetes
• Hypoglycemia
• Growth and development disorders, short stature, overgrowth disorders
• Thyroid disorders, hypothyroidism, hyperthyroidism, thyroid nodules
• Hypopituitarism
• Cushing's disease
	• Diabetes mellitus:
	  ○ Diabetic ketoacidosis (DKA)
	  ○ Sick day management
	• Hypoglycemia
	• Adrenal crisis
	• Diabetes insipidus
	• Precocious puberty
	• Calcium metabolic disorders
		• Diabetes mellitus
		• Hypoglycemia
		• Thyroid disorders, hypothyroidism, hyperthyroidism
		• Hypopituitarism
		• Congenital adrenal hyperplasia
		• Disorders of sex differentiation (DSD), ambiguous genitalia
		• Diabetes insipidus
		• Puberty disorders, precocious puberty
		• Calcium metabolic disorders

- Micropenis
- Obesity, exogenous and hormonally mediated
- Diabetes insipidus, central and nephrogenic
- Puberty disorders delayed and precocious puberty
- DSD, ambiguous genitalia
- Calcium metabolic disorders
- Parathyroid disorders
- Vitamin D metabolic disorders
- Multiple endocrine neoplasia, type 1 and type 2
- Polyglandular diseases, type 1, type 2, and type 3
- Bone disorders, osteoporosis, and skeletal dysplasia
- Hormone resistance syndromes

Examples from Each Area

Short Stature (Outpatient Referral)

Medical Expert	Communicator	Collaborator	Manager	Health Advocate	Scholar	Professional
Obtains an efficient, focused history of short stature, system review, and family history **Performs standardized anthropometric measurements, and**	Communicates with patient and his/her parents about the diagnosis and prognosis Counsels and educates parents on the importance of treatment	Liaises effectively with other specialties such as genetics and dietitian	Arranges for growth hormone stimulation if indicated	Responds to individual patient's health needs and issues, as part of patient care in Saudi Arabia	Critically appraises research findings about growth disorders using PICO model	Remains up-to-date on local screening and management guidelines Requests investigations according to local protocol

dysmorphic feature, CVS, RS, abdominal, CNS, and pubertal assessment, while ensuring patient comfort **Makes a differential diagnosis** **Initiates appropriate investigations guided by the differential diagnosis** **Interprets critical clinical, laboratory, and imaging findings** **Outlines medical management according to updated guidelines**				Selects patients who need urgent growth hormone testing		Complies with professional responsibility with regard to disease registry

PICO, Problem/Patient/Population, Intervention/Indicator, Comparison, Outcome; CVS, Cardiovascular system; RS, Respiratory system; CNS, Central nervous system

Diabetic Ketoacidosis (Emergency Room (ER) Referral)

Medical Expert	Communicator	Collaborator	Manager	Health Advocate	Scholar	Professional
Obtains an efficient, focused history of diabetes symptoms, past medical history, system review, family history, medications Performs the ABC assessment, ensures the	Communicates with patient and his/her parents about the diagnosis and prognosis Counsels and educates patients and their parents on the role of detection of DKA and prevention	Liaises effectively with other specialties such as ER and PICU	Arranges for admission	Responds to individual patient's health needs and issues, as part of patient care in Saudi Arabia	Critically appraises research findings about diabetes and DKA using the PICO model	Remains up-to-date on treatment guidelines Requests investigations according to local protocol Complies with professional

stability of patients, performs CVS, RS, abdominal, and CNS examination while ensuring the patient's comfort Makes a differential diagnosis Initiates appropriate investigations guided by the differential diagnosis Interprets critical clinical and laboratory data Outlines and initiates medical management according to updated guidelines				Identifies patients who need PICU admission		responsibility with regard to disease registry

DKA, Diabetic ketoacidosis; ABC, Airway, Breathing, and Circulation; ER, Emergency room; PICU, Pediatric intensive care unit; PICO, Problem/Patient/Population, Intervention/Indicator, Comparison, Outcome; CVS, Cardiovascular system; RS, Respiratory system; CNS, Central nervous system

Disorders of Sex Differentiation (DSD) (Inpatient Referral)

Medical Expert	Communicator	Collaborator	Manager	Health Advocate	Scholar	Professional
Obtains an efficient, focused history including prenatal history, symptoms of adrenal crisis,	Communicates with patient and his/her parents about the diagnosis, prognosis, and sex of rearing	Liaises effectively with other specialties such as NICU, urology, and genetics	Arranges for stimulation testing, US, karyotyping	Responds to individual patient's health needs and issues as part of patient care in Saudi Arabia	Critically appraises research findings about DSD using the PICO model	Remains up-to-date on treatment guidelines Requests investigations according to local protocol

postnatal course, system review, family history, and medications Performs the ABC assessment, ensures stability of patients, performs CVS, RS, abdominal, CNS, and genitalia examination while ensuring the patient's comfort Makes a differential diagnosis Initiates appropriate investigations guided by differential diagnosis Interprets critical clinical and laboratory data Outlines and initiates medical management according to updated guidelines		Complies with professional responsibility with regard to disease registry

ABC, Airway, Breathing, and Circulation; NICU, Neonatal intensive care unit; PICO, Problem/Patient/Population, Intervention/Indicator, Comparison, Outcome; CVS, Cardiovascular system; RS, Respiratory system; CNS, Central nervous system; DSD, Disorders of sex differentiation; US, Ultrasound

Expected Level of Competency for Core Subspecialty Level Problems

The Saudi Board of Pediatric Endocrinology Fellowship Program aims to provide high-level, state-of-the-art clinical training, education, and research opportunities in the field of pediatric endocrinology in concordance with international educational standards to graduate qualified and safety-oriented pediatric endocrinologists.

Overall Goal

To train physicians with added competency in pediatric endocrinology medicine, who will provide primary and consultation services. In addition, the goal is also to provide clinical and initial basic academic training for physicians who intend to pursue academic careers in pediatric endocrinology.

This section details the structure and competencies to be achieved and the methods of achievement. Educational components and goals in the curriculum which will be made available to the fellows and faculty include the following:

- Competency-based goals and objectives for each assignment at each educational level will be distributed to the fellows and faculty at least annually, in either written or electronic format.
- An individual educational plan devised at the beginning of the program, which includes a weekly block rotation diagram displaying the clinical, didactic, and research activities by rotation.
- Written goals and objectives for each rotation or major learning experience. Includes the educational purpose, teaching methods, types of clinical settings, other educational resources to be used, and the method for evaluation of the fellows' competencies.
- Regularly scheduled didactic sessions, journal clubs, seminars, and morbidity and mortality conferences. Topics are outlined in the learning and teaching section.
- Delineation of each fellow's responsibilities for patient care, progressive responsibility for patient management, and supervision of fellows over the continuum of the program.

Research

The pediatric endocrinology fellowship views research as a very important and essential part of the program and expects the fellows to publish a minimum of one peer-reviewed research publication during the period of the fellowship. In the first year of the fellowship, the fellow is expected to learn the basics of research design including the choice of study type, power analysis, and various statistical analyses. In addition to the required coursework in biostatistics, the fellow is required to read several textbooks on research design. The fellow is expected to select one or more general topics related to the subspecialty for his/her research during the first three months of the fellowship and select a mentor for his/her project.

The fellow will then develop a hypothesis and conduct background research during his/her assigned time for the research rotation and begin implementing the project thereafter. The research rotation and work should be monitored by a designated mentor at any of the training sites. By the end of the fellow's senior year, the research should be presented at a national meeting and published in a peer-reviewed journal.

Program Overview

- The first year will be focused on clinical development through learning in the inpatient wards, outpatient clinics, and rotations in radiology, laboratory, genetics, adult endocrinology, and elective modules.
- The second year will be tailored to the fellows' sub-subspecialty requirements and to fulfill the research requirement. This year can be partly completed in an accredited center abroad.

Fellows are required to satisfactorily complete all assigned rotations for each academic year. Successful completion of rotations requires approval from the fellow's direct supervisor(s) and the program director.

Required Clinical Rotations for the Fellows

Required rotations include the didactic and practical experiences necessary for the fellow to become a professional pediatric endocrinologist.

Training level	Consultation service	Radiology and laboratory	Adult endocrinology	Genetic metabolic	Elective	Research	Vacation
F1	9 months	1 month	-		1 month	-	1 month
F2	6 months	-	6 weeks	1 month	1 month	6 weeks	1 month

FIRST YEAR OF THE PEDIATRIC ENDOCRINOLOGY FELLOWSHIP PROGRAM (F1)

The bulk of the training in clinical pediatric endocrinology is provided in the first year. The fellow will visit the outpatient clinics of the pediatric endocrine unit. This includes several general pediatric endocrine clinics, the pediatric diabetes clinic, and other specialized clinics such as the bone or lipid clinics located in the center. Through these clinics, the fellow will be exposed to the full range of both new patient referrals to pediatric endocrinology, as well as to longitudinal follow-ups of outpatients with pediatric endocrine disorders. The fellow will also manage the pediatric endocrine inpatient and consultation services. This will provide exposure to the full range of inpatient pediatric endocrinology services. All activities will be performed under appropriate supervision by pediatric endocrine consultants. The direct patient care activities will be supplemented with specific scheduled conferences and didactic presentations. By the end of the first year, the fellow is expected to have acquired deep knowledge and the ability to manage most endocrine disorders, along with training in and mastering of the following additional CanMEDS competencies.

Competencies Required in the First Year

Communicator

1. Effectively present endocrine consults (accurate, complete, and organized).
2. Communicate care plan and results of testing to the patient and family.
3. Keep other members of the healthcare team informed about relevant patient issues.
4. Effectively present at teaching rounds (including consultants and junior trainees: well prepared, organized, and appropriate to audience levels).
5. Counsel families with newly diagnosed diabetes mellitus (DM).
6. Effectively document medical history, diagnostic formulation, progress notes, plans, discharge summaries, consult notes, and medical reports.

Collaborator

1. Work effectively with healthcare team members and maintain acceptable and workable co-worker relationships.
2. Handover patient care to the next healthcare provider (next fellow) to ensure continuity of patient care.
3. Participate in polite, shared decision-making with physicians and other colleagues in the healthcare profession.

Manager

1. Determine whether the results of testing necessitate evaluation by other specialists, and effectively communicate this to consultants and patients.
2. Demonstrate initiative in patient management, contribute with comments, and ask questions in clinics and on rounds; additionally, remain alert to the possible significance of diagnostic clues.
3. Serve as the primary healthcare coordinator for children with DM, and as the front-line consultant for children with endocrine disorders.
4. Manage and integrate the care of patients with multisystem medical problems.

5. Triage and complete consultations in an appropriate time frame.
6. Utilize healthcare resources appropriately and implement accepted preventive measures.
7. Suggest the use of investigations judiciously to manage patients and avoid unnecessary procedures.

Scholar

1. Search medical literature using online databases such as MEDLINE, EMBASE, and Cochrane to find and read relevant articles.
2. Participate in all academic activities of the division including attending weekly rounds, post-clinic conferences, clinical case discussions, and resident teaching sessions.
3. Critically appraise medical literature and adapt relevant literature to practice.

Professional

1. Consider issues of confidentiality when discussing patient issues.
2. Exhibit respect for all healthcare team members.
3. Demonstrate a sense of responsibility (punctual, dependable, reliable, and honest with respect to all information).
4. Exhibit sound professional attitude and awareness of limitations.
5. Demonstrate a willingness to respond to constructive feedback.

Health advocate

1. Advocate for every individual patient, population, and community.
2. Adapt practice, management, and education to every individual patient.
3. Promote health and disease prevention (such as obesity prevention and healthy activities for life promotion).
4. Identify the important determinates which impact patient health, and recognize and respond to issues requiring advocacy (common example is obesity).
5. Promote patient-family-centered care.

Description of Clinical Rotations During the First Year

Consultation Service (Nine Months) (Inpatient, Outpatient, and Endocrine Emergency Cases)

General Objectives

By the end of the consultation service rotations, the fellow should be able to effectively diagnose and manage the most common pediatric endocrine problems and be able to develop an appropriate acute and long-term treatment plan. The fellow will spend seven months at his/her local in-training hospital and two months (outside rotation) at one of the other accredited centers. These nine months will be spent equally between inpatient and outpatient services.

Roles

Medical expert

1. Obtain a complete, accurate, and organized endocrine-related history.
2. Perform an endocrine-specific physical examination:
   - Thyroid exam
   - Pubertal assessment using Tanner Staging
   - Perform anthropometric measurements (height, weight, body mass index (BMI), waist circumference, head circumference, arm span, upper-to-lower body segment ratio) and plot them using appropriate reference growth curves.
3. Develop a deep knowledge of the physiology of normal and abnormal physical growth and puberty.
4. Determine appropriateness of hormonal testing to investigate possible endocrine disorders.
5. Interpret results of testing appropriately to determine if a definitive diagnosis can be made or if further evaluation is required.
6. Describe the indications and interpretation of all endocrine stimulation tests:
   - Growth hormone stimulation
   - Prolonged fasting challenge
   - Water deprivation test
   - Adrenocorticotropic hormone (ACTH) stimulation
   - Luteinizing hormone-releasing hormone (LHRH) stimulation
   - Oral glucose tolerance test
   - Growth hormone suppression test
   - Dexamethasone suppression test
   - Human chorionic gonadotropin (HCG) stimulation test
7. Diagnose and manage the following conditions (please refer to Appendix A for a comprehensive list of core clinical problems and detailed mapping):
   - Type 1 and 2 diabetes mellitus, monogenic diabetes including the role of nutrition, exercise, and pharmacological management including but not limited to insulin pump therapy and complications
   - Diabetic ketoacidosis
   - Sick day management for type 1 diabetes
   - Hyperinsulinism and other hypoglycemic disorders
   - Growth disorders (short and tall stature)
   - Hypo- and hyperthyroidism
   - Adrenal disorders
   - Hypertension related to endocrine disorders
   - Disorders of sexual development and gender identity
   - Disorders of puberty (precocious and delayed)
   - Fluid and electrolyte disorders, including diabetes insipidus, and syndrome of inappropriate antidiuretic hormone (ADH) secretion
   - Pituitary gland disorders (anterior and posterior)
   - The following syndromes: Turner syndrome, Klinefelter syndrome, and Down syndrome.
8. Possess deep knowledge about the following:
   - Alterations in the endocrine system in patients with systemic disease
   - Autoimmune diseases related to the endocrine system
   - Genetics related to endocrine disorders

Radiology and Endocrine Laboratory Rotation (One Month)

During this four-week rotation, fellows are expected to become familiar with different types of endocrinological laboratory studies (including indications and limitations) and radiological studies used in pediatric endocrine cases (including indications and patient preparation). The rotation will be organized such that half the overall duration is spent in the laboratory and the other half in the radiology department.

Roles

Medical expert

Endocrine laboratory

- Demonstrate knowledge and understanding of the performance of bioassays, immunoassays, and immunoradiometric techniques, including assessment and interpretation of results.
- Demonstrate knowledge and understanding of the use and interpretation of diagnostic steroid studies, hormone receptor assays (including High Performance Liquid Chromatography (HPLC)), and other non-immunoradiometric tests such as chemiluminescent assays.
- Become familiar with the pitfalls and limitations of immunoassays.
- Determine factors which affect the yield of the test, similar to but not limited to the hook effect in the immunometric assay.
- Become familiar with normal reference ranges for hormones based on age and sex.
- Develop familiarity with different types of genetic studies such as karyotyping, fluorescence in-situ hybridization (FISH), comparative genomic hybridization (CGH), single gene studies, and whole-exome sequencing.
- Gain basic and advanced knowledge of endocrine genetic studies.
- Determine the applicability and appropriateness of functional (stimulation) testing to the clinical situation.
- Understand the management of potential complications of functional testing.
- Demonstrate an ability to communicate the physiology pertaining to testing, methods, risks, and benefits to families.
- Interpret results of testing appropriately to determine if a definitive diagnosis can be made and/or if further studies are indicated with regard to the following:

  1- Anterior Pituitary
  - ACTH
  - Thyroid stimulating hormone) (TSH)
  - Prolactin
  - Gonadotropin (Leutinizing hormone (LH), Follice stimulating hormone (FSH))
  - Growth hormone, Insulin-like growth factor (IGF), IGF-binding protein-3 (IGFBp3), Growth hormone binding protein (GHBP), acid labile subunit (ALS)

  2- Posterior Pituitary
  - Vasopressin level

3- Thyroid Gland
- Thyroxine (T4), Free thyroxine (FT4)
- Triiodothyronine (T3), Free triiodothyronine (FT3)
- Thyroglobulin (TG)
- Thyroxine-binding globulin (TBG)
- Thyroid antibodies (Abs)
- Thyroglobulin Ab
- Thyroid peroxidase Ab
- TSH Receptor Ab (TSHR Ab)

4- Adrenal Gland
- Renin
- Aldosterone
- Cortisol
- Pregnenolone
- 17-hydroxypregnenolone
- 17-hydroxyprogesterone
- 11-deoxycortisol
- Deoxycorticosterone (DOC)
- 18-hydroxycorticosterone
- Dehydroepiandrosterone
- Dehydroepiandrosterone sulfate
- Androstenedione

5- Testes and Ovary (Gonads)
- Total testosterone
- Free testosterone
- Dihydrotestosterone
- Estrogen
- Estradiol
- Progesterone

6- Obesity
- Lipid profile
- Serum leptin
- Molecular genetic studies for leptin gene or leptin receptor mutation

7- Bone
- Parathyroid hormone (PTH)
- Serum calcium, pH, magnesium, alkaline phosphatase
- 25-hydroxy Vitamin D
- 1,25 $(OH)_2$ D_3

8- Pancreas
- C-peptide
- Serum insulin
- Anti-insulin Ab
- Anti-Islet cell Ab
- Anti-glutamic acid decarboxylase (anti-GAD Ab)
- Glycated hemoglobin (HbA1c) level
- Fructosamine level

9- Other Antibodies
- Anti-endomysial Ab

10-Urine

- 24-h urine collection for cortisol
- Urine calcium, pH, creatinine, magnesium
- Urine for ketone, glucose, and reducing substances
- Urine Ca-creatinine ratio
- Urine magnesium creatinine ratio
- Phosphate creatinine ratio
- Urine for microalbumin
- Urine osmolality

Radiology

- Demonstrate a good understanding of the bone age X-ray study and ability to assess study results efficiently.
- Develop an understanding of the indications, contraindications, safety, special preparation, interpretation, advantages, disadvantages, and implications for clinical management of the following procedures for endocrine glands:
  - Magnetic Resonance Imaging (MRI)
  - Computed Tomography (CT)
  - Ultrasound (US)
  - Bone mineral densities
  - Iodine (I)-131 scans
  - Sestamibi scans
  - Metaiodobenzylguanidine (MIBG) scans
  - Positron emission tomography (PET) scans
- Select medically appropriate investigations in a cost-effective and ethical manner.
- Read and interpret results from internal genitalia organ imaging (uterus, ovaries) in cases of ambiguous genitalia, including genitograms.
- Read and interpret Dual-Energy X-ray Absorptiometry (DEXA) scans for bone mineral density.
- Read and interpret radiological features of skeletal dysplasia (e.g. bone dysplasia) and metabolic bone disease (e.g. rickets).

SECOND YEAR OF THE PEDIATRIC ENDOCRINOLOGY FELLOWSHIP PROGRAM (F2)

During the second year, the fellow will obtain sufficient clinical exposure to solidify his/her clinical expertise. In addition, the fellow's autonomy with patient evaluation and management is expected to increase during this time. The fellow is expected to acquire a high level of understanding of basic sciences and their application to the management of endocrine disorders and learn approaches to investigate and manage complex and rare endocrine problems. During this year, the fellow will have the opportunity to rotate in the adult endocrinology section to obtain enough exposure to endocrine cases which are not frequently presented in the pediatric age group. Additionally, one month of training will be offered in genetic metabolic disease management. A one-month elective rotation is offered in the second year which provides the fellow with an opportunity to maximize his/her exposure in the specific field. An additional one-month period will be spent training in the research field to gain more exposure to research and start his/her own fellow continuity clinic. During this period, the fellow is expected to gain experience in designing and conducting hypothesis-driven research. The fellowship research project is expected to culminate in the submission of at least one manuscript to a peer-reviewed journal. The fellow is expected to train in and master additional CanMEDS competencies as described below.

Competencies Required in the Second Year

Communicator

1. Present endocrine cases at the level of a junior consultant.
2. Communicate with the patient and the patient's family (recognize, understand, and be sensitized to the emotional needs of patients and families, and demonstrate the ability to develop rapport and trust with the patient and the patient's family).
3. Keep other members of the healthcare team informed about relevant patient issues.
4. Plan and effectively present at teaching rounds (including consultants and junior trainees: well prepared, organized, suitable to the type of audience).
5. Counsel families with newly diagnosed DM, congenital hypothyroidism, Turner syndrome, congenital adrenal hypoplasia, or sex differentiation disorder.
6. Document medical history, diagnostic formulation, progress notes, plans, discharge summaries, consult notes, and medical reports effectively.
7. Counsel patients in the following contexts:
    - Communicating bad news
    - Counseling
    - Discharge against medical advice (DAMA)
    - Procedure consent
    - Initiating new therapy (e.g., chemotherapy)
    - Difficult parents
    - Management of conflicts
    - Refusing treatment

Collaborator

1. Work effectively with healthcare team members, maintain acceptable and workable co-worker relationships.
2. Appropriately handover patient care to other healthcare providers (next fellow, consultant) to ensure continuity of patient care.
3. Participate in polite, shared decision-making with physicians and other colleagues in the healthcare profession.
4. Determine when care should be transferred to another physician or healthcare professional.

Manager

1. Demonstrate initiative in patient management, and comment and ask questions in clinics and on rounds; remain alert to the potential significance of diagnostic clues.
2. Serve as the primary health care coordinator for children with DM or multisystem medical problems.
3. Triage and complete consultations within an appropriate duration.
4. Utilize healthcare resources appropriately and implement accepted preventive measures.
5. Use investigations judiciously to manage patients and avoid unnecessary procedures.
6. Provide supervision for junior staff of the team (junior fellows, pediatric residents, interns, and medical students).

Scholar

1. Effectively search medical literature through online search databases such as MEDLINE, EMBASE, and Cochrane to find and read relevant articles.
2. Plan a scholarly research project and write a research proposal.
3. Participate in all academic activities of the division including attending weekly rounds, post-clinic conferences, clinical case discussions, and resident teaching sessions.
4. Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and raise focused questions which address them.
5. Critically appraise medical literature and adapt relevant literature to practice.
6. Teach endocrine-specific physical examination to small groups (three to five learners):
   - Thyroid exam
   - Pubertal assessment using Tanner Staging
   - Perform anthropometric measurements (height, weight, BMI, waist circumference, head circumference, arm span, upper-to-lower segment ratio) and plot them using appropriate reference growth curves

Professional

1. Demonstrate a sense of responsibility (punctuality, dependability, reliability, and honesty in all information).
2. Recognize and respond to ethical issues encountered in practice.
3. Be respectful to all healthcare team members.
4. Demonstrate sound professional attitude and awareness of limitations.
5. Consider issues of confidentiality when discussing patient issues.
6. Demonstrate willingness to respond to constructive feedback.
7. Demonstrate commitment to patient safety and quality improvement.

Health advocate

1. Promote patient-family-centered care.
2. Advocate for judicious use of healthcare resources.
3. Adapt practice, management, and education to the individual patient.
4. Promote health and disease prevention (i.e., obesity prevention, healthy active living, etc.) through participation in company or clinic activities.

Description of Clinical Rotations During the Second Year

Consultation Service (Six Months) (Inpatient, Outpatient, and Endocrine Emergency Cases):

General Objectives

By the end of the consultation service rotations, the fellow should be able to effectively diagnose and manage pediatric endocrine problems, and to develop an appropriate acute and long-term treatment plan at a junior consultant level. The fellow will spend four months at his/her local in-training hospital and two months (outside rotation) at one of the other accredited centers. These six months will be split equally between inpatient and outpatient services.

Roles

Medical expert

1. Demonstrate increasing independence and autonomy with regard to the evaluation and management of children referred for evaluation by the pediatric endocrinology group.
2. While all clinical care will be provided under the supervision of the teaching staff, the fellow is expected to take primary responsibility for presenting the diagnosis, prognosis, and treatment plan to the patient and family for patients seen by the trainee at the clinic.
3. Supervise the evaluation and development of a treatment plan by medical interns and pediatric residents who participate in the outpatient pediatric endocrine clinics.
4. Demonstrate a deep knowledge of hormone receptors, mutations, and their clinical presentation.
5. Demonstrate an understanding of the role and indications of genetic testing for the following:
   - Maturity onset diabetes of the young (MODY)
   - Hypoglycemic disorders
   - Neuroendocrine tumors
   - Obesity
6. Manage the following conditions in addition to the disorders listed for the first year of training (please refer to Appendix A for a comprehensive list of core clinical problems and detailed mapping):
   - Bone disorders
   - Thyroid cancer
   - Neuroendocrine tumors
   - Autoimmune polyglandular syndrome
   - Obesity and its related disorders
   - Endocrine complications secondary to childhood cancer treatments

7. Utilizing insulin pumps and interpreting continuous glucose monitoring readings in patients with Type 1 diabetes mellitus:
   - Communicates with patients and families about benefits and potential risks of the utilization of technology in the management of type 1 diabetes mellitus.
   - Determines the appropriateness of utilization of insulin pump therapy for patients with type 1 diabetes mellitus, taking into consideration their ability for self-care, medical history, and social history.
   - Determines the appropriateness of utilization of continuous glucose monitoring for type 1 diabetes management, taking into consideration the patients' ability for self-care, medical history, and social history.
   - Interprets blood glucose data obtained from insulin pumps, continuous glucose monitoring, and in-home closed-loop therapy to determine the need for changes in the insulin regimen to improve diabetes control and prevent complications.
8. Demonstrate a deep knowledge in the following:
   - Alterations in the endocrine system in patients with systemic disease
   - Alterations in the endocrine system in persons with critical illness
   - Nutrition in the setting of endocrine disorders

Adult Rotation

General Objectives

The goals of the adult rotation are to learn about endocrine disorders presented in adults and to develop a deep understanding of the transition to adult care.

Roles

Medical expert

1. Expected to learn, diagnose, and manage disorders which are important in pediatric endocrine practice, but are rare in pediatric patients. Thus, there is limited opportunity to diagnose and manage these disorders in pediatric patients. However, as these disorders are more common in adult patients, adult rotations provide valuable learning opportunities for pediatric endocrine fellows. Examples include the following:
   - Hyperparathyroidism
   - Thyroid cancer
   - Cushing's Disease
   - Adrenal cancer
   - Acromegaly
2. Learn about the long-term complications of endocrine disorders presenting in childhood, such as diabetes.
3. Gain perspective on the role of the endocrine team during the transition to adult care.

Genetic Metabolic Rotation

General Objectives

The goals of this rotation are to learn about the relationship between genetics and endocrine diseases and to apply genetic concepts relevant to endocrine diseases.

Roles

Medical expert

1. Demonstrate an understanding of the patterns of inheritance, including Mendelian/non-Mendelian and multifactorial patterns.
2. Know the principles of neonatal screening for endocrine disorders and their applications in the Kingdom of Saudi Arabia and the Gulf region.
3. Know the general principles of genetic tests, including biochemical, cytogenetic, and molecular labs, and counseling for endocrine and metabolic disorders.
4. Become familiar with the genetic tests used for diagnosing a wide variety of chromosomal, monogenic, and syndromic disorders which are encountered in endocrine clinics including alterations of growth, adrenal gland disorders, sexual differentiation disorders, calcium disorders, and glucose hemostasis disorders.
5. Become familiar with common genetic pediatric endocrine disorders such as Prader-Willi syndrome, Laurence-Moon-Biedi syndrome, Turner's syndrome, Down syndrome, Klinefelter syndrome, and overgrowth syndrome.
6. With regard to dysmorphic features in children:
   - Become familiar with dysmorphology terminologies and description
   - Demonstrate ability to perform different body measurements required to evaluate a dysmorphic child
   - Know the principles for querying medical databases
7. Prenatal diagnosis: implications, indications, methods available for diagnosis, and ethical issues
8. Read and interpret radiological features of skeletal dysplasia (e.g., bone dysplasia) and metabolic bone disease (e.g., rickets).

Elective Rotation

General Objectives

Fellows are encouraged to undertake rotations in other specialties which are relevant to pediatric endocrinology, and those which will provide opportunities for additional exposure to areas which may be of interest in the future. This rotation can be undertaken abroad at an accredited center. Topics for elective rotation include childhood nutrition, insulin pump therapy, bone disorders, genetic metabolic disorders, adult endocrinology, bariatric surgery, rural rotation, and longitudinal clinics. The aim is to provide an opportunity to fill the gaps in training which may arise from low exposure to specific diseases, and to create an opportunity for advanced training at a reputable international center. Additionally, the aim is also to help solidify the fellow's interest by offering opportunities for extra rotations with a specific focus such as attending cases related to the lipid clinic, cases of complex bone disease, apheresis, genetic diseases, obesity, thyroid cancer, neuroendocrine tumors, childhood nutrition, and cases requiring insulin pumps.

The following conditions must be fulfilled with regard to an elective rotation:

1. The elective period is planned prospectively by the fellow and the program director.
2. There is a clearly designated elective supervisor.
3. The educational objectives of the elective are understood by the fellow, elective supervisor, and the program director.

Fellow Continuity Clinic

General Objectives

The fellow will participate in a weekly clinic and see new and follow-up patients with various endocrine disorders, supervised by an attending physician. This clinic provides an opportunity for the fellow to work gradually toward being independent. All cases are chosen by the fellow to enhance his/her learning opportunity.
The continuity care experience aims to ensure that the fellow provides, oversees, and coordinates the medical care of his/her panel of patients, including chronic disease management, acute illness evaluation and management, and preventive medical care. Such care is offered in the setting of a collaborative environment with the support and assistance of the consultant, a nurse, and clerical support staff.

Research Rotation

General Objectives

During this rotation, fellows will continue working on the research project which was initiated during the first year in pediatric endocrinology. On consultation with the program director, a mentor is chosen for each fellow, who becomes the primary educator for the research project. The mentor will impart knowledge about the following: technical skills, experimental and study design, subject recruitment, statistical evaluation of results, data presentation, writing of grant proposals, and manuscript preparation. The scientific, ethical, and legal aspects of biomedical research, including the process of informed consent, will be emphasized. Fellows will be involved in the research project on a daily basis. This includes subject recruitment and obtaining informed consent (under the supervision of the mentor), administrative tasks such as scheduling research participants' procedures, ordering supplies, and writing progress reports, and running assays. Fellows will be involved in designing their own research projects, writing grant proposals, conducting their own data analyses, and preparing manuscripts for publication. The research project may focus on either clinical, laboratory, or medical education. In general, the fellow is expected to spend up to a maximum of one full day per week performing clinic duties during the research rotation, in addition to on-call duties.

The fellow is expected to complete the following research objectives:

1. Participate in the design, conduct, and evaluation, of a research project, and additionally aid in the preparation of a project-related manuscript for publication.
2. Demonstrate understanding of the requirements for conducting research in a scientifically sound manner.
3. Adhere to the ethics of the performance and presentation of research.
4. Critically review the published scientific literature and present an abstract at a national meeting.
5. Attend institutional, local, and/or national meetings and present his/her research.

Note: The trainee fellow may choose to work with any of the multiple researchers who supervise research projects. For information on the researchers who are available, the fellow should consult with his/her local program director.

QUALITY AND SAFETY ASSURANCE

Training Rules/Regulations and Trainee Rights

Please refer to the rules/regulations published by the SCFHS (available on www.scfhs.org).

Duty Hours of the Fellows in the Learning and Working Environment

Please refer to the rules/regulations published by the SCFHS (available on www.scfhs.org).

Professionalism, Personal Responsibility, and Patient Safety

1. Programs and activities at the primary training site will help educate fellows and faculty members about the professional responsibilities of physicians including appearing for duty appropriately rested and fit to provide the services required by their patients.
2. The program will be committed to and responsible for promoting patient safety and fellow well-being in a supportive educational environment.
3. The program director will ensure that fellows are integrated and are participating actively in interdisciplinary clinical quality improvement and patient safety programs.
4. The following are the learning objectives of the program:
   - Become accomplished through an appropriate blend of supervised patient care responsibilities, clinical teaching, and didactic educational events
   - Fellows should not be excessively relied upon to fulfill non-physician service obligations
5. The program director and the institution will ensure a culture of professionalism which supports patient safety and personal responsibility.
6. Fellows and faculty members will demonstrate an understanding and acceptance of their personal role in the following:
   - Assurance of the safety and welfare of patients entrusted to their care
   - Provision of patient and family-centered care
   - Assurance of fitness for duty
   - Management of their time before, during, and after clinical assignments
   - Recognition of impairment, including illness and fatigue in themselves and their peers
   - Attention to lifelong learning
   - Self-monitoring of indicators of improvement in patient care performance
   - Honest and accurate reporting of duty hours, patients, and clinical experience data
7. All fellows and faculty members must demonstrate responsiveness to patient needs which supersedes self-interest. They must recognize that under certain circumstances, the best interests of the patient may be served by transitioning the patient's care to another qualified and rested provider.

Patient Transition of Care

1. The program will include clinical assignments to minimize the number of transitions in patient care.
2. The primary training site and the program will ensure and monitor effective and structured hand-over processes to facilitate both continuity of care and patient safety.
3. The program will ensure that the fellows are competent in communicating with team members with regard to the handover process.

4. The primary training site will ensure the availability of schedules which inform all members of the healthcare team about the attending physicians and fellows currently responsible for each patient's care.

Alertness Management/Fatigue Management

1. The following will be undertaken in the program:
   - Educating all faculty members and fellows to recognize the signs of fatigue and sleep deprivation
   - Educating all faculty members and fellows in alertness management and fatigue management processes
   - Adopting fatigue management processes to manage the potential negative effects of physician fatigue on patient care and learning, such as naps or back-up call schedules
2. Have a process to ensure continuity of patient care in the event that a fellow may be unable to perform his/her patient care duties.
3. Provide adequate sleep facilities and/or safe transportation options for fellows who may be too fatigued to safely return home.

Supervision of Fellows

1. In the clinical learning environment, each patient will have an identifiable, appropriately credentialed, and privileged attending physician (or licensed independent practitioner as approved by each SCFHS) who is ultimately responsible for the specific patient's care.
   - This information will be available to fellows, faculty members, and patients.
   - Fellows and faculty members will inform patients about their respective roles in the patient's care.
2. The program will ensure that the appropriate level of supervision is in place for all fellows who care for patients.
3. Supervision may be exercised through a variety of methods. Some activities require the physical presence of the supervising faculty member. For many aspects of patient care, the supervising physician may be a more advanced resident or fellow. Other aspects of care provided by the fellow can be adequately supervised by the immediate availability of the supervising faculty member or fellow physician, either within the institution or by means of telephonic and/or electronic modalities. In some circumstances, supervision may include post-care review of fellow-delivered care with feedback on the appropriateness of such care.

Levels of Supervision

To ensure oversight of supervision of the fellows and for graded authority and responsibility, the program classifies supervision as follows:

1. Direct Supervision: The supervising physician is physically present with the fellow and patient, within the hospital or at another site of patient care and is immediately available to provide direct supervision.
2. Indirect Supervision: The supervising physician is not physically present but is immediately available by means of telephonic and/or electronic modalities to provide direct supervision.
3. Oversight: The supervising physician is available to provide a review of encounters with the patient and give feedback after care delivery.

4. The privilege of progressive authority and responsibility, conditional independence, and a supervisory role in patient care delegated to each fellow will be assigned by the program director and the faculty members.

Guidelines

1. The program director will evaluate each fellow's abilities based on specific criteria. When available, evaluation will be guided by specific national standard-based criteria.
2. Faculty members functioning as supervising physicians will delegate aspects of care to fellows based on the patient's needs and the fellow's skills.
3. Senior fellows will serve in a supervisory role for junior fellows in recognition of their progress toward independence, based on the needs of each patient and the skills of the individual resident or fellow.
4. Each fellow must know the limits of his/her scope of authority and the circumstances under which he/she is permitted to act with conditional independence. In particular, a first-year fellow will be supervised either directly or indirectly with immediately available direct supervision.
5. Faculty supervision assignments will be of sufficient duration to assess the knowledge and skills of each fellow and the supervisor will delegate to him/her the appropriate level of patient care authority and responsibility.

TEACHING AND LEARNING

Teaching and learning will be designed for delivery through various methods by mixing formal didactic lectures and self-learning processes through a structured and programmatic core education program. It will be flexible to allow the trainee to direct his/her learning based on his/her needs.

I. Formal Teaching and Learning Activities:
   1. Core specialty topics
   2. Universal topics
   3. Workshops and courses

II. Academic-Based Learning (PBL):
   1. Morning report case presentations
   2. Journal club
   3. Case presentation
   4. Grand rounds

III. Work-Based Learning (WBL):
   1. Daily round-based learning
   2. On-call-based learning
   3. Clinic-based learning

Suggested Resources

Textbooks

- Sperling's Pediatric Endocrinology textbook 4th Edition - Elsevier
- Brook's Clinical Pediatric Endocrinology 6th Edition - Wiley
- Williams Textbook of Endocrinology 13th Edition - Elsevier
- Fima Lifshitz's Pediatric Endocrinology 5th Edition
- Pediatric Endocrinology and Inborn Errors of Metabolism 2nd Edition
- Pumping Insulin: Everything You Need for Success with an Insulin Pump, Book by John Walsh and Ruth Roberts

Guidelines

- Endocrine Society guidelines
- International Society for Pediatric and Adolescent Diabetes (ISPAD) guidelines
- American Diabetes Association (ADA) guidelines
- Canadian Diabetes Association (CDA) guidelines
- American Thyroid Association (ATA) guidelines
- European Society for Pediatric Endocrinology guidelines
- International Diabetes Federation (IDF) guidelines

Websites for Societies for Clinical Practice Guidelines

- https://www.endocrine.org/
- https://www.pedsendo.org/home/

- https://www.thyroid.org/
- https://www.ispad.org/
- http://www.diabetes.org/
- http://guidelines.diabetes.ca/
- https://www.idf.org/
- http://www.eurospe.org/
- http://www.endo-metab.ca/
- http://www.jdrf.ca/

Journals

- The Journal of Clinical Endocrinology and Metabolism
- Hormone Research
- The Journal of Pediatric Endocrinology and Metabolism
- Pediatric Diabetes
- The Lancet Diabetes & Endocrinology
- Pediatrics
- JAMA Pediatrics
- Archives of Disease in Childhood
- The Cochrane Database of Systematic Reviews
- Pediatric Clinics of North America
- Best Practice & Research: Clinical Endocrinology & Metabolism
- Endocrinology & Metabolism Clinics of North America

Recommended Conferences

- The Saudi endocrine society conference
- The Endocrine Society Conference
- The Pediatric Endocrine Society Conference
- The International Society for Pediatric and Adolescent Diabetes Conference
- Pediatric Endocrinology Board Review Course
- European Society for Pediatric Endocrinology annual meeting
- International Diabetes Federation Meeting
- International DSD Meeting
- The American Diabetes Association Conference
- The Canadian Diabetes Association Conference
- The American Thyroid Association Meeting

Formal Teaching and Learning Activities

A formal teaching time session will be planned in advance with an assigned tutor; the time slot and venue will be assigned for each session. Formal teaching time excludes bedside teaching, clinic postings, etc.

	Center	SCFHS	Self-directed
Specialty and trainee-selected topic	Formal weekly training for 1-4 h	Formal monthly half-day training	Self-directed study
Problem-based learning	1. Morning report or case presentations 2. Journal clubs 3. Hospital grand rounds and other Continuing Medical Education (CME) activities	1. Workshops 2. CME activities 3. Research day 4. Universal topics	1. Self-directed study 2. Portfolio 3. Presentation

Core Specialty Topics

Core specialty topics can be delivered in the form of interactive lectures, problem-based sessions, team-based sessions, tutorials, or patient case simulations. The final choice of the delivery method is left to the teacher's discretion and the learner's preferences. Examples of delivery methods and each method's objectives are provided below.

Activity	Method of delivery	Objectives
Topic review	Interactive lecture	1. Review common conditions in the practice of ambulatory, emergency, and inpatient conditions.
Multiple Choice Question (MCQs)/Slides	Problem-based	1. Train and teach residents about how this mode of assessment is to be performed. 2. Identify weaknesses and strengths in knowledge and practice. 3. Become more confident in attending such exams.
Approaches to common conditions	Interactive lecture	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 teaching	Tutorial, Bedside teaching	1. Practice history-taking and demonstrate competence in advanced interviewing skills. 2. Master basic skills in physical examination and be able to perform and interpret a focused examination. 3. Exhibit professional behavior, including demonstration of respect for patients, colleagues, faculty, and others in all settings. 4. Prepare the fellow for clinical exams.

Communication skills	Patient case simulation	1. Develop patient-centered therapeutic communication through shared decision-making and effective dynamic interactions with patients, families, other professionals, and other important individuals. 2. Counsel and educate patients and their parents on the importance of early diagnosis and prophylaxis. 3. Master skills of basic interviewing and demonstrate competence in advanced interviewing skills. 4. Exhibit professional behavior, including demonstration of respect for patients, colleagues, faculty, and others, in all settings.
Medical ethics	Problem-based	1. Apply ethical knowledge in clinical care. 2. Describe the process of informed healthcare decision-making, including the elements which must exist and the specific components of an informed consent discussion. 3. Discuss surrogate decision-making for incapacitated patients, including a discussion of who can and should act as a proxy decision-maker and the standards they should use to make healthcare choices for the patient. 4. Do-not-resuscitate (DNR) orders, community-based DNR orders, and advance directives. 5. Describe the legal, ethical, and emotional issues surrounding the withholding and withdrawing of medical therapies. 6. Describe the legal issues pertaining to refusal to treat, discharge against medical advice, etc.
Data interpretation	Interactive lecture	1. Describe the different investigational tools used in pediatrics and its subspecialties. 2. Describe ways to appropriately interpret different investigational data. 3. Demonstrate knowledge about appropriate utilization of investigational tools in common and uncommon conditions. 4. Recognize limitations of different investigation tools.
Research methodology & preparation	Interactive lecture	1. Develop basic knowledge in research design, including study design, abstract writing skills, and presentation skills. 2. Gain competence in literature review, data synthesis, data analysis, and interpretation. 3. Develop a viable research proposal with the help of a faculty mentor. 4. Conduct research on a topic broadly related to pediatrics or pediatric subspecialties. 5. Communicate research findings through oral presentations, poster presentations, abstract preparation, or by publishing articles.

Examples of Core Topics to be Covered in Half-Day Academic Activities			
	Topic	**Suggested mode of delivery**	**Objectives**
Diabetes	Diabetes basics	Interactive lecture	To understand: ❖ B-cell physiology ❖ Insulin signaling transduction ❖ Epidemiology of diabetes ❖ Defining the diagnostic criteria for diabetes and identifying the different types of diabetes ❖ Age-based recommended glycemic targets ❖ Monitoring systems for home blood and urine glucose monitoring ❖ Personalizing treatment goals based on national therapeutic targets while recognizing the individual patient's circumstances
	Approach to hyperglycemic emergencies	Interactive lecture	To understand: ❖ Different types of diabetic hyperglycemic metabolic emergencies ❖ Appropriate management of the hyperosmolar hyperglycemic state (HHS) and DKA ❖ Provide advice about future prevention of hyperglycemic emergencies
	New-onset DM	Patient case simulation	❖ Educate patients in the appropriate use of insulin syringes, injection pens, and home blood glucose monitoring ❖ Provide advice on the indication for insulin initiation, different regimen options, and dose adjustment
	Diabetes complications	Problem-based learning	To understand: ❖ Pathophysiology of diabetes, complications of diabetes, and their associated risk factors ❖ Principles and practice of screening for diabetic complications ❖ Develop approaches for management of short-term and long-term complications

	Insulin pump therapy	Workshop	❖ Know the criteria for starting subcutaneous insulin infusion (CSII) ❖ Know how to perform insulin dosing for CSII ❖ Ongoing insulin adjustment
	Type 2 diabetes (T2DM)	Interactive lecture	❖ Diagnosis of T2DM ❖ Treatment recommendations ❖ Complications of T2DM
	Monogenic diabetes	Team-based learning	❖ Diagnosis of MODY ❖ Treatment of MODY ❖ Presentation of neonatal diabetes ❖ Types of neonatal diabetes ❖ Treatment for neonatal diabetes
Growth disorders	Normal growth	Interactive lecture	❖ Demonstrate ability to assess appropriate growth: ○ Measurement ○ Growth charts ○ Body proportions ○ Skeletal maturation ○ Prediction of adult height ○ Parental target height ❖ Factors which regulate prenatal and postnatal growth ❖ Differences among widely used growth charts
	Growth hormone (GH)	Lecture	To understand: ❖ Physiology of GH secretion ❖ Stimulation testing: ○ Indication ○ Stimulant agents ○ Interpretation ❖ GH Receptor/GH-Binding Protein ❖ GH-IGF-1 axis
	Short stature	Team-based learning	❖ Primary growth abnormalities ○ Osteochondrodysplasias ○ Chromosomal abnormalities ○ Intrauterine growth retardation ○ Other genetic causes of short stature ❖ Secondary growth disorders ○ Malnutrition ○ Chronic diseases ○ Endocrine disorders ❖ Treatment of growth disorders ❖ Treatment of constitutional delay ❖ Treatment of GH deficiency ❖ Side effects of GH

			❖ Novel modalities for treatment of growth hormone deficiency (GHD) ❖ Monitoring GH therapy ❖ Monitoring serum IGF-1 levels ❖ Role of bone age assessment ❖ Assessment of treatment efficacy and optimizing growth response ❖ Transition to adult management ❖ GH treatment for other forms of short stature ○ Chronic renal failure ○ Turner syndrome ○ Down syndrome ○ Intrauterine growth retardation or Small for gestational age ○ Prader-Willi syndrome ○ Osteochondrodysplasias
	Tall stature	Lecture	❖ Overgrowth of the fetus ❖ Tall stature and postnatal statural overgrowth ❖ Differential diagnosis of tall stature ❖ Precocious and delayed puberty ❖ Diagnosing familial tall stature ❖ Management of constitutional and syndromic tall stature ❖ Excess GH secretion and pituitary gigantism ❖ Diagnosis of GH excess ❖ Treatment of GH oversecretion
Puberty & gonads	Puberty basics	Interactive lecture	❖ Hypothalamic-pituitary-gonadal axis ❖ LHRH stimulation testing, indication, and interpretation
	Precocious puberty	Problem-based learning	❖ Differential diagnosis of precocious puberty ❖ Approach to central and peripheral precocious puberty ❖ Understand indication, use, and follow-up of pubertal suppression
	Delayed puberty	Case discussion	❖ Differential diagnosis of delayed puberty ❖ Approach ❖ Pubertal induction
Disorder of sexual differentiation	Normal sexual differentiation	Interactive lecture	❖ Embryological development ❖ Genetic control of normal sexual development ❖ Understand the indication and interpretation of HCG stimulation

	Ambiguous genitalia	Case discussion	❖ Definition of ambiguous genitalia ❖ Approach to ambiguous genitalia ❖ Sex of rearing determination
Posterior pituitary	Posterior pituitary basics	Interactive lecture	❖ Physiology of osmotic and volume regulation ❖ Volume sensor and effector pathways ❖ Differential diagnosis of disorders of water metabolism
	Hyponatremia		❖ Differential diagnosis of hyponatremia ❖ Investigations ❖ Emergency treatment of acute and chronic hyponatremia
	Hypernatremia		❖ Differential diagnosis of hypernatremia ❖ Central diabetes insipidus ○ Causes of central diabetes insipidus ○ Treatment of central diabetes insipidus ❖ Nephrogenic diabetes insipidus ○ Causes of nephrogenic diabetes insipidus ○ Treatment ❖ Investigations ❖ Emergency treatment of acute and chronic hypernatremia
Thyroid disorders	Thyroid gland basics	Interactive lecture	❖ Understand normal anatomy ❖ Thyroid hormone biosynthesis ❖ Thyroid hormone genomic and non-genomic actions
	Hypothyroidism	Tutorial	❖ Diagnosis of hypothyroidism ❖ Hypothyroidism investigations ❖ Difference between neonatal screening programs for congenital hypothyroidism (CH) ❖ Management of CH ❖ Management of hypothyroidism
	Hyperthyroidism	Interactive lecture	❖ Diagnosis of hyperthyroidism ❖ Hyperthyroidism investigations ❖ Management of neonatal Graves' disease ❖ Management of hyperthyroidism ❖ Role of radioiodine ablations in pediatric Graves' disease ❖ Role of surgery

	Thyroid cancer	Interactive lecture	❖ Know different types of thyroid cancer ❖ Diagnosis of thyroid cancer ❖ Management of thyroid cancer ❖ Role of radioiodine ablations in pediatric Graves' disease ❖ Role of surgery ❖ Long-term monitoring
Hypoglycemia	Approach to hypoglycemia diagnosis	Interactive lecture	❖ Definition of hypoglycemia ❖ Symptoms and signs of hypoglycemia ❖ Physiologic adaptation of glucose metabolism ❖ Major causes of hypoglycemia in infants and children ❖ Emergency treatment of hypoglycemia
	Hyperinsulinism	Interactive lecture	❖ Know how to diagnose various forms of hyperinsulinism: ○ Potassium (K) ATP channel hyperinsulinism ○ Glutamate dehydrogenase hyperinsulinism ○ Glucokinase hyperinsulinism ○ Short-chain 3-OH acyl-CoA dehydrogenase (SCHAD) hyperinsulinism ○ Exercise-associated hyperinsulinism ○ Hypoglycemia ○ Carbohydrate-deficient glycoprotein Hyperinsulinism ○ Factitious hyperinsulinism ○ Insulinoma ○ Autoimmune hypoglycemia ❖ Management of hyperinsulinism
Adrenal disorders	Adrenal cortex basics	Interactive lecture	❖ Regulation of steroidogenesis ❖ Perform and interpret tests of adrenal function
	Neonatal and infantile primary adrenal insufficiency	Case discussion	❖ Genetic lesions in steroidogenesis ❖ Clinical forms of CAH ❖ Incidence of CAH ❖ Genetics of CAH ❖ Prenatal diagnosis of CAH ❖ The importance of steroid replacement during intercurrent illness

			❖ Commonly used glucocorticoid preparations ❖ Pharmacologic therapy ❖ Withdrawal of glucocorticoid therapy ❖ Stress doses of glucocorticoids ❖ Mineralocorticoid replacement
	Childhood primary adrenal insufficiency	Tutorial	❖ Differential diagnosis of acute primary adrenal insufficiency ❖ Differential diagnosis of chronic primary adrenal insufficiency ❖ Demonstrate ability to investigate and manage suspected primary and secondary adrenal failure, including acute presentations ❖ Long-term follow-up ❖ Provide perioperative care for patients with suspected or proven adrenal insufficiency
	Adrenal excess	Interactive lecture	❖ Demonstrate ability to investigate and provide first line management of Cushing's syndrome ❖ Demonstrate ability to investigate and manage patients with suspected adrenal tumors
	Endocrine hypertension	Interactive lecture	❖ Demonstrate ability to investigate suspected endocrine hypertension and provide first line management of pheochromocytoma and adrenocortical hypertension
Bone disorders	Bone basics	Interactive lecture	❖ Demonstrate understanding of calcium and phosphorus hemostasis ❖ Vitamin D metabolism ❖ PTH hormonal effects ❖ Normal bone changes with aging ❖ Interpret DAX findings
	Approach to hypercalcemia	Interactive lecture	❖ Diagnosis of hypercalcemia ❖ Approach to hyperparathyroidism ❖ Emergency treatment of hypercalcemia
	Approach to rickets	Interactive lecture	❖ Demonstrate ability to diagnose forms of rickets ❖ Approach to hypoparathyroidism ❖ Management of hypocalcemia ❖ Management of vitamin D disorders

Obesity	Obesity background	Interactive lecture	❖ Neuroendocrine regulation of energy balance ❖ Obesity definition ❖ Prevalence and epidemiology ❖ Metabolic impact of childhood obesity
	Disorders of obesity	Interactive lecture	Know the clinical presentation and management of the following: ❖ Monogenetic disorders of the negative feedback pathway ○ Leptin deficiency ○ Leptin receptor deficiency ○ POMC splicing mutation ○ Prohormone convertase-1 deficiency ○ Melanocortin-3 receptor mutation ○ Melanocortin-4 receptor mutation ○ SIM-1 mutation ❖ Pleiotropic obesity and mental retardation disorders ○ Prader-Willi syndrome ○ Bardet-Biedl syndrome ○ TrkB mutation ○ Carpenter syndrome ○ Cohen syndrome
	Evaluation and treatment: Obese child workup	Interactive lecture	❖ Lifestyle modification ○ Dietary intervention ○ Physical activity intervention ○ School intervention ○ Family intervention ❖ Pharmacotherapy ○ Indications for pharmacotherapy ○ The future of pediatric obesity pharmacotherapy ❖ Bariatric surgery
Endocrinology basic science	Receptor transduction of hormone action	Interactive lecture	❖ Types of hormone receptors ❖ Hormonal transduction pathway ❖ Activating and inactivating mutations
	Hormonal assay methods	Interactive lecture	❖ Types of hormonal assays ❖ Pre-analytic variables ❖ Standardization ❖ Reference ranges ❖ Validation methods ❖ Quality assurance and quality control

Others	Lipids	Interactive lecture	❖ Lipid metabolism ❖ Types of dyslipidemia ❖ Guideline recommendation for detection and treatment
	Autoimmune polyglandular Syndromes (APS)	Interactive lecture	❖ Classification of APS ❖ Clinical aspects ❖ Diagnostic approach and follow-up ❖ Treatment ❖ Genetics of APS I, II ❖ Autoantibodies in APS ❖ Long-term follow-up
	Multiple endocrine neoplasia (MEN) syndromes	Interactive lecture	❖ MEN syndromes ❖ Clinical presentation ❖ Genetic testing ❖ Long-term cancer surveillance ❖ Carney complex
	Pheochromocytoma		❖ Biosynthesis and actions of catecholamines ❖ Clinical presentation of pheochromocytoma ❖ Diagnosis ❖ Genetic differential diagnosis ❖ Tumor localization ❖ Management
	Endocrinopathy related to prematurity	Case discussion	❖ Endocrine complications related to prematurity
	Late endocrine effects of cancer	Case discussion	❖ Complications arising from malignancy and its related therapies ❖ Long-term monitoring
Research	Principles of epidemiology	Interactive lecture	❖ Study types: intervention, diagnosis, prognosis ❖ Study designs: systematic reviews, randomized controlled trials, cohort studies, and case reports ❖ Understand the strengths and limitations of randomized-controlled studies, retrospective and prospective cohort studies, cross-sectional studies, case series, and case-control studies ❖ Understand the strengths and limitations of subgroup analyses

	Statistical analysis	Interactive lecture	❖ Distinguish different types of variables ❖ Understand how the type of variable affects the choice of statistical test ❖ Understand the appropriate use of the mean, median, and mode ❖ Interpret a p-value ❖ Distinguish statistical significance from clinical importance ❖ Interpret a confidence interval ❖ Identify a type I error ❖ Identify a type II error ❖ Perform measurements of association ❖ Calculate and interpret a relative risk ❖ Calculate and interpret an odds ratio ❖ Calculate and interpret number needed to treat ❖ Understand the uses and limitations of a correlation coefficient
	Formulating study design	Practical hands-on session	❖ Formulate the research question ❖ Identify the study design most likely to yield valid information with respect to the research question ❖ Identify the statistical analysis which is most suitable to yield valid information pertaining to the research question ❖ Identify strengths and limitations of the study

Example of Weekly Schedule of Formal Teaching and Learning Activities

	AM	PM
Sunday	8:00-8:30 Morning case presentation	
Monday	8:00-9:00 Morning case presentation 11:00-12:00 Endocrinology fellows teaching session	Citywide Endocrine Club (7:00-11:00 pm every 3rd week) (optional)
Tuesday	8:00-9:00 Morning case presentation	

Wednesday	8:00-9:00 Pediatrics grand rounds 10:00-11:00 Endocrine division grand rounds	
Thursday	8:00-8:30 Morning case presentation 11:00-12:00 Joint radiology-neuroendocrine rounds once/month (optional)	12:00-1:00 Joint pediatric-adult meeting every 3rd week 1:00-2:00 Meeting with mentor to discuss portfolio and Mini-CEX

Universal Teaching Topics

Universal modules have been developed by the SCFHS Level for all specialties, which are delivered centrally by the commission through an e-learning platform. Each universal topic includes a self-assessment section at the end of the module. At the end of each Learning Unit, an online formative assessment is available. After all the topics are completed, a combined summative assessment is conducted through context-rich MCQs. All trainees must attain minimum competency in the summative assessment. Passing these modules is a prerequisite for taking the final end-of-training exam.

The following modules are obligatory:

YEARS OF TRAINING	UNIVERSAL TOPIC
1st year	• Safe drug prescribing • Diabetes and metabolic disorders • Management of electrolyte imbalances
2nd year	• Side effects of chemotherapy and radiation therapy • Surveillance and follow-up of cancer patients • Pre-operative assessment • Patient advocacy • Ethical issues: treatment refusal and patient autonomy • Role of doctors in death and dying

Recommended Courses and Workshops:

1. Insulin pump therapy
2. Introduction to research basics (online or in-person workshop)
3. Endocrine Self-Assessment Program

Academic-Based Learning

Practice-based learning	Objective	CanMEDS Roles
Morning report case presentation	• Education through a problem-based approach • Formulate a differential diagnosis based on patient history and examination findings • Select appropriate and cost-effective diagnostic tests • Disseminate emerging best practices in evidence-based education	• Manager • Medical expert • Professional • Health advocate • Scholar
Journal club	• Teaching residents how to develop critical appraisal skills and review literature to improve patient care • Promote continuing professional development • Provide an enjoyable educational and social environment • Understand sources of bias • Understand how results of the study can be used in clinical practice • Understand the basis of diagnostic testing (prevalence, sensitivity, specificity, positive and negative predictive values, and likelihood ratios)	• Medical expert • Scholar
Case presentation	• Education through a problem-based approach • Formulate a differential diagnosis based on patient history and examination findings • Improve the residents' knowledge of the study design and statistical methods • Increase knowledge of the advances in clinical and biomedical areas	• Medical expert • Scholar

Work-Based Learning (WBL)

Work-Based Learning	Objective	CanMEDS competency
Daily round-based learning	• Focus on immediate care for patients • Learning through hands-on supervised clinical experience and bedside teaching • Demonstrate appropriate skills in history-taking, diagnosis, clinical judgment, and management of common issues in pediatric endocrinology • Receive instructions and feedback to improve interpersonal and communication skills with colleagues and patients	• Medical expert • Communicator • Health advocate • Professional
On-call-based learning	• Provide a structured approach to initial assessment with differential diagnosis for short-term management of common on-call endocrine problems • Assume appropriately increased level of responsibility while being supervised by seniors • Recognize and treat common endocrine emergencies • Develop communication skills with senior residents and nursing staff • Learn to be responsible and confident	• Medical expert • Communicator • Health advocate • Professional
Case-based learning	• Elicit detailed history and perform examination appropriate to the case, under the supervision of the consultant/senior resident	• Medical expert • Communicator • Health advocate • Professional

	• Present clinical findings and discuss the differential diagnosis and management plan with the attending consultant/senior resident • Develop communication skills and learn from the attending consultant • Interpret and discuss the requested endocrine investigation results • Discuss the management plan, including investigations, treatment, and referral to other disciplines, with the consultant • Develop effective written documentation skills

Self-Directed Learning

Activity	Objectives
	• Maintenance of a personal portfolio (self-assessment, reflective learning, and personal development plan) • Identify a good starting point for the learning task; seek assistance from colleagues or from the mentor if needed • Acquire the ability to identify own learning needs and objectives • Gather examples of acceptable learning outcomes • Improve critical thinking skills • Locate appropriate learning resources • Develop confidence and independence in learning • Develop a habit of reading journals.

ASSESSMENT

Purpose

1. Support learning
2. Accelerate professional growth
3. Monitor progress
4. Competency judgment and certification
5. Evaluate the quality of the training program

General Principles

1. Judgment will be based on holistic profiling of a trainee rather than on individual traits or instruments.
2. Assessment typically will cover both the continuous (formative) and the summative parts.
3. Trainee and faculty must meet to review the trainee's portfolio and logbook once every two months, and at the end of a given rotation.
4. Assessment will be strongly linked to the curriculum and the content.

Continuous Assessment

Assessment is of a continuous prospective nature, aiming to evaluate the trainee's competency level. The assessment is conducted throughout the academic year in the form of formative evaluations for knowledge, attitude, and skills, as outlined in the policy of continuous assessment put forward by the SCFHS. The following forms of evaluation are approved by the SCFHS Scientific Committee and are subject to future updates according to the SCFHS executive rules for training and assessment regulations.

Continuous Assessment Tools for F1 and F2

Logbook

The logbook is an integral component of the training. Each trainee must maintain a logbook of cases seen during different clinical encounters. Logbook cases should cover all elements of the core training program as per the curriculum outline suggested by the training committee. The educational supervisor is in charge of monitoring, reviewing, and providing continuous feedback to the trainee. See appendix for type and number of cases to be collected by the trainee.

Community Activities

These include activities aimed toward improving community healthcare such as quality assurance projects and health volunteering during health promotion community activities or medical crises. See appendix for the evaluation form.

In-Training Evaluation Report (ITER)

This report is generated based on a quarterly continuous evaluation conducted during rotations, which aims to assess the trainee's core competency achievements as a medical expert, professional, communicator, collaborator, scholar, health advocate, or leader.

Annual Written Progress Test

The annual written progress test is typically conducted at the end of the training year for trainees in the first and second years of training.

MCQs and Short Answer Questions (SAQs)

The annual written progress test assesses the theoretical knowledge base (including recent advances) and problem-solving capabilities of candidates in the specialty of pediatric endocrinology. It is delivered in an MCQ and SAQ format and is held once a year. The number of exam items, eligibility, and passing score are determined in accordance with the commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, which is as follows: www.scfhs.org.sa.

Academic Activities

Records of educational training evaluation of at least six to eight presentations per year should be maintained, which may include the following:

1. Morning report
2. Case presentations
3. Grand rounds
4. Journal clubs
5. Research activities
6. Others

Research

Completion of a minimum of one research project and preparation of a scientific manuscript suitable for publication in a peer-reviewed journal is a requirement. The research subject should be related to a pediatric endocrinology subspecialty. The research project can be a case series, cohort study, randomized controlled trial, or a systematic review. For detailed information regarding research project evaluation and scoring system, please refer to Appendix C: Assessment Forms.

Final In-Training Evaluation Report (FITER)

This is a quarterly continuous evaluation performed during rotations**.** This aims to assess the trainee's core competency achievements as a medical expert, professional, communicator, collaborator, scholar, health advocate, or leader.

Summary of Continuous Assessment Tools as per Training Year*	
Training Level	Evaluation Item
F1	ITER
	Logbook
	Community activities
	Annual Written Progress Test

F2	ITER
	Logbook
	Research
	Academic Activities

*Trainees & Trainers are advised to check the latest updated list of assessment tools published online, as this list may be subjected to changes from time to time.

Scoring System and Promotion Decision

The performance of the fellow will be evaluated according to the rules for assessment set forth by the SCFHS. Each assessment tool is evaluated according to the following:

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

A fellow will be eligible for promotion from one training level to the next training level if he/she has attained a minimum of borderline pass in all continuous assessment tools. In case the trainee has attained borderline failure in one evaluation, he/she can still be considered for promotion as long as the remaining assessment tools were fulfilled with a minimum clear pass in at least one assessment tool, provided the promotion decision has been supported by the SCFHS Scientific Committee (Please refer to the executive policy for continuous assessment and annual promotion available at www.scfhs.org).

Summative Assessment and Certification

Certificate of training completion will only be issued upon the resident's successful completion of all program requirements. Candidates obtaining a "pass" evaluation for all components of the final specialty examination are awarded the "Saudi Board of Pediatric Endocrinology" certificate.

Requirements for Certification

1. Successful completion of a two-year Saudi commission accredited program in pediatric endocrinology.
2. Successful completion of the certification examination in pediatric endocrinology.

The two-year program outlined above is considered as the minimum training requirement. Additional training may be required by the program director to ensure that clinical competence has been achieved.

Final SCFHS Pediatric Endocrinology Board Examination

The final Saudi Board examination consists of two parts:

Final Written Exam: MCQs and SAQs
This examination assesses the theoretical knowledge base (including recent advances in the field) and problem-solving capabilities of candidates in the specialty of pediatric endocrinology. It is delivered in an MCQ and SAQ format and is held once a year. The number of exam items,

eligibility, and passing score are determined in accordance with the commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, which is as follows: www.scfhs.org.sa.

Final Clinical Exam:

The trainee needs to pass a written exam to be eligible for the clinical exam. This examination assesses a broad range of high-level clinical skills, including data gathering, patient management, and communication and counseling skills. The examination is held at least once a year in an objective structured clinical examination (OSCE) format and includes patient management problems (PMPs). The fellow can be promoted to the next year level only after passing the oral exam. The exam eligibility and passing score are determined in accordance with the commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, which is as follows: www.scfhs.org.sa.

APPENDIX

A: Examination Blueprint for Certification Exam

B: Core Clinical Problems and Detailed Mapping

C: Evaluation Forms

APPENDIX A

Examination Blueprint for the Final Certification Exam and the Promotion Exam*

Subject		**Domain**				
	%	Epidemiology	Pathogenesis & Basic Science	Diagnosis, Investigation, & Data Interpretation	Management	Other
Carbohydrate Metabolism	16					
Bone and Mineral Metabolism	10					
Thyroid Disorders	14					
Adrenal Disorders	12					
Pituitary/ Hypothalamus	10					
Growth	10					
Reproductive Endocrine System	12					
Other Hormones	2					
Lipids	2					
Multiple Endocrine Neoplasia and Polyglandular Autoimmune Disease	2					
Methods and Biological Principles	3					
Knowledge of Scholarly Activities	7					
		~ 10–15%	~ 20–25%	~ 20–25%	~ 30–40%	~ 5–10%

*Trainees & Trainers are advised to check the latest updated blueprint published online as it may be subjected to changes from time to time.

APPENDIX B

Core Clinical Problem and Detailed Mapping

For core clinical problems and detailed mapping, the Saudi Fellowship of Pediatric Endocrinology will adapt the learning framework outlined by the American Board of Pediatric Endocrinology (can be accessed at https://www.abp.org/sites/abp/files/pdf/endo_latest.pdf)

APPENDIX C

Evaluation Forms

Electronic evaluation forms approved by the SCFHS, such as those available through the One45 software, should be utilized whenever applicable.

Continuous assessment form Institution:	Evaluated By: Fellow's Name: Rotation: Pediatric Endocrinology Rotation Evaluation Dates: Completed on:
Number of patients forming the basis of this evaluation:	<20 20-30 30-40 >40

Please select the level of milestones which best describe the fellow's performance during the pediatric endocrinology rotation. (*See appendices for detailed descriptions of each category.)

	1	2	3	4	5	N/A
Medical Expert						
History-taking						
Physical examination						
Clinical and basic science knowledge						
Communicator						
Oral and written communication						
Counseling skills						
Collaborator						
Collaboration with the inter-professional healthcare team						
Scholar						
Self-directed learning						
Evidence-gathering						
Leader						
Management of time and patient care						
Health Advocate						
Patient advocacy						
Professional						
Professional and ethical practice						

Overall Competence (for Level of Training)

Please check the appropriate box to indicate the extent to which the resident has met the objectives outlined for his/her level of training.	Unsatisfactory	Needs Improvement	Competent	Exceeds Expectations

1. Was a mid-rotation assessment conducted?
Yes
No

If yes, the mid-rotation was:	Unsatisfactory	Satisfactory

2. Feedback: Comment on aspects of performance which were effective. Be specific and describe the impact. Highlight aspects which would interest you in the future.

Start, or do more... Identify behaviors which the student knows how to do, can do, or can do more often.

……

……

Consider... Highlight a point of growth for the student, a "doable" challenge for future interactions.

……

……

Stop, or do less…Point out actions which were not helpful or could be harmful. Be specific and indicate potential impact.

……

……

3. Question to fellow: Do you agree with this evaluation?
Yes
No
4. *Did you have an opportunity to meet with this trainee to discuss their performance?
Yes
No
*Did you have an opportunity to discuss your performance with your preceptor/supervisor?
Yes
No
*Are you in agreement with this assessment?
Yes
No

Please mention below comments you may wish to make (if any) about this evaluation.

……

……

*** cannot be left blank**

Appendix for detailed description of each category

Medical Expert						
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
History-taking		Gathers too little or too much information about the child's presenting complaint. Misses key questions in the endocrine history and review of systems. Unable to assess the importance or relevance of information gathered; therefore, presents information in the order elicited with no filtering or prioritization.		Demonstrates advanced pattern of information gathering where information relevant to the child's presenting complaint, including a complete endocrine review of systems, is filtered, prioritized, and synthesized into specific diagnostic considerations.		Elicits accurate and relevant history about the child's presenting complaint in a targeted and efficient manner. Demonstrates ability to filter, prioritize, and synthesize information for even complex or uncommon endocrine problems. Creates a robust illness script which enables discrimination among endocrine diagnoses with subtle distinguishing features.
Level	NA O	1 O	2 O	3 O	4 O	5 O
Physical examination		Inconsistently performs appropriate, thorough physical examinations based on the patient complaints.		Performs accurate and focused physical examinations based patient complaints. Demonstrates appropriate physical		Performs highly organized, efficient, accurate, and focused physical examinations based on patient complaints. Performs

		Misses key findings in the physical examination, particularly about the endocrine-specific systems (thyroid, Tanner Staging, growth parameters). Inconsistently displays an organized approach to the relevant endocrine examination.		assessment techniques, in particular, for endocrine-specific systems (thyroid, Tanner Staging, growth parameters). Identifies changes in physical examination findings over time.		appropriate general and endocrine-specific physical examination techniques with ease. Routinely identifies subtle or unusual physical findings which influence clinical decision-making.
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Clinical and basic science knowledge		Knowledge of the basic principles of endocrine disorders.		In-depth knowledge of endocrine disorders and best practices.		Knowledge of research and updates pertaining to endocrine disorders.
Communicator						
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Oral and written communication		Uses a standard medical interview template for history-taking and does not vary approach based on individual child's needs. Feels uncomfortable asking personal questions and defers difficult conversations to others. Inconsistently conveys information in a clear and logical manner to		Uses the medical interview to effectively establish rapport with patients and their families. Displays verbal and nonverbal skills which promote respect, trust, and understanding. Develops scripts to approach difficult communication scenarios and is able to mitigate most physical, cultural, psychological,		Effectively uses communication to establish and maintain a trusting therapeutic alliance in an authentic manner. Intuitively manages difficult communication scenarios with respect and humility. Effectively synthesizes and conveys patient health-specific information to the patients themselves, to families, and to

		patients, families, and other health professionals. Does not clearly address questions asked by referring physicians in consultation letters and misses key points in the clinical impression and plan.		and social barriers to communication. Clearly conveys information about the child's condition to patients, families, and other health professionals in both oral and written communication. Develops clear consultation which effectively conveys the clinical impression and plan to primary physicians and other professionals.		other healthcare professionals with appropriate focus and modification based on the setting. Successfully uses consultation and clinic letters to address concerns of referring physicians and educates about patients and their health conditions.
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Counseling skills		Misses key counseling aspects pertaining to endocrine disorders. Unable to address patient's current and future needs.		Demonstrates acceptable patterns of counseling skills. Able to address patient's current and future needs.		Demonstrates advanced counseling skills for complex endocrine conditions including counseling for genetic testing and prenatal diagnostics.
Collaborator						
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Collaboration with inter-professional healthcare team		Inconsistently formulates a clear clinical question for another consultant to address or to guide interpretation of		Asks meaningful questions to guide the input of other specialists. Actively participates in collaborative decision-making and carefully		Requests consultations and tests with a clear understanding of the questions being asked and their potential impact on the child's care.

		test results by other members of the multidisciplinary team (e.g., radiologists, pathologists). Identifies roles of other team members but does not recognize how or when to use them as resources. Avoids or inadvertently contributes to inter-professional conflicts.		considers recommendations from consultants to effectively manage patient care. Displays a comprehensive understanding of the roles and responsibilities of team members and partners in providing care. Demonstrates a consistent and respectful approach in handling inter-professional conflicts.		Integrates effectively with other members of the inter-professional team and efficiently coordinates activities to optimize the child's care. Manages discordant recommendations from multiple consultants. Prevents, negotiates, and resolves inter-professional conflicts effectively.
Scholar						
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Self-directed learning		Sets learning objectives for pediatric endocrinology based on available curriculum materials without modifying these objectives to suit personal learning needs. Acknowledges external assessments with limited insight into own performance.		Formulates individualized learning objectives based on specific interests, needs, and learning style. Actively seeks opportunities to meet objectives. Demonstrates understanding of own performance and both welcomes and incorporates feedback.		Develops individualized learning objectives based on specific interests, needs, and learning style with a concrete plan to address objectives during the pediatric endocrinology rotation. Effectively and efficiently seeks opportunities and resources to learn while demonstrating flexibility to collaborate with other learners. Demonstrates consistent and reflective self-assessment with

						internal prompts for improving performance.
Level	NA **O**	**1 O**	**2 O**	**3 O**	**4 O**	**5 O**
Evidence-gathering		Demonstrates limited background knowledge of pediatric endocrinology diseases. Reads material which is readily available, to learn more about common pediatric endocrinology conditions. Does not ask questions or access literature or previous knowledge when developing management plans.		Demonstrates progressive increase in knowledge of pediatric endocrine diseases. Consistently reads about patients seen during the pediatric endocrinology rotation and consults resources beyond readily available materials. Displays active questioning, analysis, and application of evidence in developing a rationale for a care plan.		Anticipates hypothetical clinical scenarios based on current and prior experiences and systematically addresses identified knowledge gaps by accessing multiple evidence resources in pediatric endocrinology. Displays elaborate questioning and critical analysis of evidence in developing a rationale for patient management.
Leader						
Level	NA **O**	**1 O**	**2 O**	**3 O**	**4 O**	**5 O**
Management of time and patient care		Demonstrates difficulty in organizing patient care responsibilities and focuses care on problems as they arise, without prioritization. Suggests ordering too many or too few		Prioritizes patient care responsibilities and anticipates future needs. Organizes and manages time appropriately, unless patient volume is high or there is a perception of competing priorities.		Serves as a role model for efficiency. Actively prioritizes responsibilities to proactively prevent interruptions which can be anticipated and multi-tasks effectively and safely to avoid interruptions

		investigations for children with suspected or confirmed endocrine diseases.		Identifies medically appropriate investigations for children with suspected or confirmed endocrine diseases in an ethical and resource-effective manner.		which are unavoidable.
Health Advocate						
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Advocacy		Attends to the medical needs of patients seen during the pediatric endocrinology rotation. Demonstrates active desire to take good care of patients and to act in their best interests.		Identifies and appropriately responds to individual patient issues. Describes impact of endocrine disease on child's participation in home, school, and, social settings, and/or at work; identifies opportunities for advocacy and health promotion.		Picks up on even subtle cues from child or family to identify issues which may impact the child's well-being, and effectively acts on opportunities for advocacy and health promotion. Demonstrates a broader understanding of the impact of chronic endocrine diseases on a child's quality of life; seeks to create a positive impact beyond the individual patient, clinic, and/or hospital.

Professional						
Level	NA **O**	**1** **O**	**2** **O**	**3** **O**	**4** **O**	**5** **O**
Professional and ethical practice		Acts to build rapport with children and their families, as well as with other trainees and health professionals. Inconsistently displays insight into professional role and expected professional behaviors. Recognizes ethical issues but is often unsure of how to address them effectively. Displays difficulty in balancing personal and professional obligations.		Develops trusting, therapeutic relationships with children and their families, as well as supportive relationships with other members of the healthcare team. Demonstrates appropriate professional behaviors in practice, including honesty, integrity, commitment, compassion, respect, and altruism. Recognizes and responds appropriately to ethical issues. Balances personal and professional priorities to ensure personal health and commitment to professional obligations.		Intuitively establishes effective therapeutic relationships but extends professionalism beyond the care of patients; sees self as a professional who is contributing to something larger in the community or profession. Displays emotional intelligence and insight into the self and uses this to promote and engage in effective professional relationships with other members of the healthcare team, and to maintain personal health. Proactively prevents and addresses ethical concerns.

Academic Activities Evaluation Form

Fellow Name: _____ Level: _____
Date of Presentation: _____Topic: _____

Academic Activity number: O 1 O 2 O 3 O 4

Please use the following scale to evaluate the presentation:

Clear fail	Borderline fail	Borderline pass	Clear pass	Outstanding	Not Applicable
1	2	3	4	5	N/A

	1	2	3	4	5	N/A
- Well-prepared and demonstrated thorough knowledge of the topic						
- Presented at the appropriate level and with adequate skills						
- Used effective methods and presentation style (font, amount of information, etc.)						
- Managed time effectively						
- Used appropriate methods to critically appraise literature						
- Supported conclusions relevant to presented evidence						
Overall Performance:						

Comments:

_____

_____

_____

_____

Evaluator Name: Evaluator Signature:

Logbook

The purpose of the logbook is to:
1. Monitor the fellow's performance on a continual basis
2. Document and record the cases seen and managed by the fellow
3. Enable the fellow and his/her supervisor to determine learning gaps
4. Serve as a basis for providing feedback to the fellow

Requirements of the logbook:
- The items which will be kept in the case log will be reviewed periodically by the program director and the teaching staff.
- The logbook must demonstrate that the fellow has dealt with an adequate number of pediatric endocrinology cases; the minimum number of cases is 10 per year.
- The fellow should be able to complete a minimum of 20 CME hours of courses annually.

The following tables are examples of some of the items that the fellow's logbook should include; however, the items which may be included are not limited to those mentioned below.

PERSONAL DETAILS

Name:	
Address:	
Telephone:	

TRAINING DETAILS

Training site:	
Training year:	
Calendar year:	
Period of training covered by this logbook:	/ /20 to / /20

1. Emergency cases

Date	MRN	Diagnosis	Learning objective

2. Ambulatory cases

Date	MRN	Diagnosis	Learning objective

3. Meeting presentation

Date	Venue	Topics

Community Activities Performance Evaluation

Fellow name: _____ Date: _____

Activity type: □ Quality assurance project □ Health promotion event
□ Health volunteer
□ Other

Activity date: _____

Briefly describe the goals and objectives of the community activity in which this physician is involved:

_____

_____

_____

_____

_____

_____

Overall performance:

Clear fail	Borderline fail	Borderline pass	Clear pass	Outstanding

Indicate the strategies used to evaluate the physician's activities: _____

General comments:

_____

_____

_____

Evaluator's name _____ Evaluator's signature: _____

Research Performance Evaluation

Fellow name: _____ Date: _____

Research scope: □ Basic research □ Health services research □ Clinical research □ Educational research □ Other

Type of Research: □ Case series □ Cohort study □ RCT □ Systematic review

Indicate period of research time this assessment covers: From: _____ To: _____

Briefly describe the goals and objectives of the research project(s) in which this physician is involved:

_____

_____

_____

_____

	Components of research conduct (/rating applicable)	Clear fail	Borderline fail	Borderline pass	Clear pass	Outstanding
Contents	Critical assessment of scientific literature					
	Research question					
	Research ethics					
	Study design					
	Statistical analysis					
	Interpretation of data					
	Manuscript writing					
	Scientific integrity					
	Collaboration					

Indicate the strategies used to evaluate the physician's research activities: (√ applicable)

□ Observation and supervision □ Scientific presentations

□ Publications in peer-reviewed journals

General comments:

_____

_____

_____

Overall performance:

Clear fail	Borderline fail	Borderline pass	Clear pass	Outstanding

Evaluator's name _____ Evaluator's signature: _____

In-Training Evaluation Report (ITER)

Introduction

The annual CER is a component of criteria considered for promoting trainees to the next year level, in the specialist training program. Eligibility for promotion includes a satisfactory overall annual CER.

ITER Format

At least one ITER will be submitted by the program director upon approval by the Residency Training Committee for each trainee at the end of each training year. The ITER will be based on an average of a series of assessments, such as continuous assessments, portfolio and logbook evaluation, and clinical work sampling.

a. The promotion examination shall be held once a year within four to six weeks after completion of nine months of training in that particular year.
b. A candidate shall be eligible for the promotion exam if a minimum score of 60% is obtained on the ITER.

In-Training Evaluation Report (ITER)

Fellow Name: SCFHS No: Training Center:
Level of Training: Rotation Dates:

	Meets Expectations*						
Competencies	**Rarely**	**Inconsistently**	**Generally**	**Exceeds**	**N/A**		
Medical Expert						**Score**	**Weight %**
• Appropriate basic knowledge						**Subtotal: /100**	**50**
• Accurate history-taking and physical exam							
• Appropriate clinical decisions							
• Appropriate emergency management							
• Appropriate indication for procedures							
• Clinical skills proficiency							
Communicator							
• Appropriate interaction with patient/family/others						**Subtotal: /100**	**15**
• Accurate documentation							
• Appropriate planning							
• Clear presentation							
Collaborator							
• Proper interaction with health professionals						**Subtotal: /100**	**5**
• Proper consultations							
• Proper conflict management							
Leader							
• Proper use of information technology						**Subtotal: /100**	**10**
• Proper understanding of resources							
• Appropriate time management							
• Compliance with policies and procedures							
• Maximize benefits to patients							

Health Advocate							
• Appropriate response to patient health needs						**Subtotal: /100**	**5**
• Appropriate promotion of and participation in patient safety							
Scholar							
• Participate in appropriate medical education activities						**Subtotal: /100**	**10**
• Implement an ongoing plan for self-education							
• Analyze and integrate medical information							
• Teach others							
• Complete the electronic logbook							
Professional							
• Proper professional attitude						**Subtotal: /100**	**5**
• Understands medical and legal obligations							
• Punctual							
• Maintains ethics and morals							
• Safe physician							
• Participates in activities organized by professional organizations							
Total score:						**/100**	**100**

Comment on the strengths and weaknesses of the candidate. Make direct reference to the objectives and provide specific examples wherever possible.

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

Residency Training Committee Approval	Meeting No. Date		
Program Director Name:		**Date:**	**Signature:**
Fellow Name:		**Date:**	**Signature:**

Final In-Training Evaluation Report (FITER)

Fellow Name: SCFHS No: Training Center:

According to the Residency Program Committee, this resident has acquired the competencies of the specialty/subspecialty as prescribed in the "Objectives of Training" and is competent to practice as a specialist.

O YES O NO

The following sources of information were used for this evaluation:
☐ Clinical observations from faculty
☐ Structured assessment of a clinical encounter
☐ Feedback from healthcare professionals
☐ Completion of a scholarly project
☐ Other evaluations

COMMENTS

Date Name of Program Director

Signature

Date Name of Postgraduate Dean

Signature

Date Name of Resident

Signature

This is to attest that I have read this document.

RESIDENT'S COMMENTS:

Note: If the Residency Program Committee judges that the candidate's demonstration of competence is inconsistent with the present evaluation during the period from the date of signature on this document to the date of completion of training, it may declare the document null and void and replace it with an updated FITER. Eligibility for the examination would be determined based on the updated FITER.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	* Rarely meets	*Inconsistently meets	Generally meets	Sometimes exceeds	*Consistently exceeds
MEDICAL EXPERT					
a. Functions effectively as an endocrinology and metabolism					
b. Effectively assesses patients across the entire range of					
c. Develops comprehensive and appropriate patient-specific					
d. Performs and interprets assessments including dynamic and					
e. Interprets the results of diagnostic imaging including bone					
f. Demonstrates knowledge of a variety of diagnostic and					
g. Integrates basic and clinical science knowledge, skills, and					
h. Demonstrates knowledge of the use of radioactive iodine for					
i. Demonstrates competency in the diagnosis and management					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make a direct reference to the specific objectives and provide specific examples wherever possible.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	*** Rarely meets**	***Inconsistently meets**	**Generally meets**	**Sometimes exceeds**	*** Consistently exceeds**
PROCEDURES AND ENDOCRINE-SPECIFIC SKILLS					
Demonstrates the ability to perform diagnostic and therapeutic procedures described in					
a. Intensive diabetes care and management including insulin					
b. Dynamic endocrine testing					
Minimizes risks and discomfort to the patient.					
Overall proficient in clinical and procedural skills.					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make a direct reference to the specific objectives and provide specific examples wherever possible.

A rationale must be provided to support ratings with asterisks.	EXPECTATIONS				
	* Rarely meets	*Inconsistently meets	Generally meets	Sometimes exceeds	*Consistently exceeds
COMMUNICATOR					
a. Develops rapport, trust, and ethical therapeutic relationships with patients and/or families by providing clear and thorough explanations of diagnosis, investigation, and management of endocrine and metabolic disorders.					
b. Provides counseling to patients and/or families in an empathetic, accurate, and supportive manner with consideration for age, disability, sex, gender identity, sexual orientation, ethnicity, religion, level of education, and cultural beliefs.					
c. Establishes relationships with other health professionals and/or family and caregivers to obtain and synthesize relevant information about the patient and to direct appropriate care.					
d. Uses verbal and written inter-professional communication effectively and efficiently to optimize patient care and deliver information regarding an endocrine or metabolic disorder.					
e. Develops and communicates a management plan for patients being discharged from his/her care.					
f. Provides counseling to patients with disordered sexual development (specific for pediatric endocrinology and metabolism).					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	* Rarely meets	*Inconsistently meets	Generally meets	Sometimes exceeds	* Consistently exceeds
COLLABORATOR					
a. Participates effectively and appropriately as part of an inter-professional healthcare team to optimize care for patients with endocrine and metabolic disorders.					
b. Describes the roles and scope of practice of the members of an endocrinology and metabolism team.					
c. Works with and occasionally leads an interdisciplinary team to develop appropriate diagnostic and therapeutic strategies for patient care and self-sufficiency.					
d. Interacts effectively with other professional colleagues and seeks appropriate consultation from other health professionals in the care of patients with endocrine and metabolic disorders.					
e. Handles conflict situations effectively.					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the specific objectives and give specific examples wherever possible.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	*** Rarely meets**	***Inconsistently meets**	**Generally meets**	**Sometimes exceeds**	*** Consistently exceeds**
MANAGER					
a. Utilizes resources in a cost-effective and efficient manner.					
b. Manages clinical practice effectively and efficiently via the following:					
➢ Avoiding duplication of services ➢ Involving other caregivers when appropriate ➢ Using appropriate information technology tools ➢ Delegating responsibility effectively and appropriately as a team leader, for optimizing patient care ➢ Prioritizing patient visits appropriately					
c. Recognizes the interplay between the government and the healthcare sectors in organizing care for endocrine and metabolic patients.					
d. Recognizes the importance of human resource planning for endocrine and diabetes centers.					
e. Recognizes the role of audits, budget reviews, quality improvement, risk management, incident reporting, and complaint management in various settings including diabetes centers, endocrine testing units, the laboratory, and in both ambulatory and inpatient care settings.					
f. Participates in ongoing monitoring of clinical care pertaining to endocrinology and metabolism in various settings including diabetes centers, endocrine testing units, the laboratory, and in both ambulatory and inpatient care settings.					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make a direct reference to the specific objectives and provide specific examples wherever possible.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	* Rarely meets	*Inconsistently meets	Generally meets	Sometimes exceeds	*Consistently exceeds
HEALTH ADVOCATE					
a. Identifies important and modifiable determinants of health; educates patients and communities appropriately about dietary modifications, lifestyle issues, blood pressure control, glycemic control, hypoglycemia, and adrenal insufficiency.					
b. Identifies environmental, social, and biological factors which influence health, particularly in populations with barriers to access to care or in those populations which are vulnerable or marginalized.					
c. Recognizes situations where advocacy is appropriate for patients with endocrinology and metabolism disorders at the following levels: ➢ Individual patient level ➢ Community level ➢ Population level					
d. Identifies avenues for effective advocacy for patients with endocrinology and metabolism disorders at the following levels: ➢ Individual patient level ➢ Community level ➢ Population level					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make a direct reference to the specific objectives and provide specific examples wherever possible.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	* Rarely meets	*Inconsistently meets	Generally meets	Sometimes exceeds	* Consistently exceeds
Scholar					
a. Demonstrates a commitment to continuous personal learning.					
b. Demonstrates an ability to formulate a research question and uses appropriate research designs to answer it.					
c. Critically evaluates literature pertaining to endocrinology and implements strategies for the practice of evidence-based medicine.					
d. Helps junior trainees and other healthcare professionals to learn and acquire clinical skills in endocrinology and metabolism.					
e. Provides appropriate and effective feedback to learners.					
f. Makes well–organized, scientific, and clinically current presentations to peers and faculty.					
Completes or significantly participates in a scholarly project related to any aspect (research, education, or creative professional activity) of endocrinology and metabolism: O Yes O No					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make a direct reference to the specific objectives and provide specific examples wherever possible.

A rationale must be provided to support ratings marked with asterisks.	**EXPECTATIONS**				
	* Rarely meets	*Inconsistently meets	Generally meets	Sometimes exceeds	* Consistently exceeds
PROFESSIONAL					
a. Demonstrates integrity, honesty, courtesy, compassion, and respect for diversity.					
b. Meets the ethical, medical, legal, and professional obligations of an endocrinologist.					
c. Describes the principles of biomedical ethics and their application to clinical and research situations pertaining to endocrinology and metabolism.					
d. Recognizes personal limitations, seeks advice from others when appropriate, and accepts constructive advice.					
e. Abides by accepted guidelines of ethical interactions with the industry (particularly the pharmaceutical industry) in terms of research, education, and clinical care.					

Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make a direct reference to the specific objectives and provide specific examples wherever possible.