# MATERNAL-FETAL MEDICINE FELLOWSHIP

SUBSPECIALTIES PROGRAMS

2016

SAUDI FELLOWSHIP MATERNAL-FETAL MEDICINE CURRICULUM


بسم الله الرحمن الرحيم

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

SAUDI FELLOWSHIP

# MATERNAL-FETAL MEDICINE CURRICULUM

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| APAS | Antiphospholipid Antibody Syndrome |
| CAC | Central Assessment Committee |
| CanMEDS | Canadian Medical Education Directive for Specialists |
| CBD | Case-Based Discussion |
| CCAM | Congenital Cystic Adenomatoid Malformation |
| CCR | Comprehensive Competency Report |
| CMV | Cytomegalovirus |
| CPAM | Congenital Pulmonary Airway Malformation |
| CVS | Chorionic Villus Sampling |
| DM | Diabetes Mellitus |
| DOPS | Direct Observation of Procedural Skills |
| FBS | Fetal Blood Sampling |
| FITER | Final In-Training Evaluation Report |
| FT-MFM | Fellowship Training Program in Maternal-fetal Medicine |
| HC | Head Circumference |
| HIV | Human Immunodeficiency Virus |
| ICU | Intensive Care Unit |
| ITER | In-Training Evaluation Report |
| IUGR | Intrauterine Growth Restriction |
| IUT | Intrauterine Transfusion |
| KSA | Kingdom of Saudi Arabia |
| MEQ | Modified Essay Questions |
| MFM | Maternal Fetal Medicine |
| Mini-CEX | Mini-Clinical Evaluation Exercise |
| MPL | Minimum Performance Level |
| MSF | Multi-source Feedback |
| OSCE | Objective Structured Clinical Examination |
| PPROM | Preterm Premature Rupture of the Membranes |

| | |
|---|---|
| SAQ | Short Answer Question |
| SBA | Single Best Answer |
| SCFHS | Saudi Commission for Health Specialties |
| SLE | Systemic Lupus Erythematosus |
| SOE | Structured Oral Examination |
| TPN | Total Parental Nutrition |
| WBA | Work-place Based Assessment |

# INTRODUCTION

The ultimate goal of postgraduate medical education is to provide a reliable physician who meets society's healthcare needs. Medical educators, trainees, and patients recognize that being well trained in the scientific aspects of medicine is necessary, but insufficient for effective medical practice. The Canadian Medical Education Directive for Specialists (CanMEDS) framework, which is implemented in many postgraduate training programs around the world, offers a competency-based model that emphasizes not only biomedical expertise, but also additional, non-medical expert roles that aim to better serve societal needs. Therefore, the Saudi Commission for Health Specialties (SCFHS) is adopting the CanMEDS framework to support the core curriculum of all postgraduate medical training programs. Physicians who qualify for certification will be competent to function in the seven CanMEDS Roles: Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar, and Professional.

The Fellowship Training Program in Maternal-fetal Medicine (FT-MFM) consists of three years of full-time structured and supervised postgraduate fellowship training. Upon successful completion of the program, the trainee will be awarded the "Fellowship in Maternal-Fetal Medicine".

## Context of Practice

The Fellowship Training Program for Maternal-Fetal Medicine (FTP-MFM) was founded in 2015 as one of the training programs of the SCFHS. Certification by the Saudi Board of Obstetrics and Gynecology (or its equivalent) is one of the prerequisites for practicing and further training in the subspecialty of maternal-fetal medicine.

The FTP-MFM is a three-year training program. It encompasses education in the basic sciences, training in cognitive and technical skills, development of clinical knowledge, and acquisition of sound intervention judgment. The program provides an opportunity for trainees to learn the fundamentals of basic sciences in depth, as applied to clinical maternal-fetal medicine. A graduate of the FTP-MFM is expected to work as a competent specialist in the field of maternal-fetal medicine. Graduates are expected to have the following capabilities and skills:

1) Sound knowledge of the principles of maternal-fetal medicine;
2) Ability to formulate a reasonable and comprehensive differential diagnosis and management of medical diseases in pregnancy;
3) Recognize emergency situations related to maternal-fetal medicine and manage them effectively and safely;
4) Select relevant investigations logically and conservatively, and interpret their results accurately;
5) Manage common problems in general maternal-fetal medicine and possess knowledge of management alternatives;
6) Perform a range of required surgical, diagnostic, and therapeutic procedures;
7) Communicate well with patients, their relatives, and colleagues;
8) Maintain timely, orderly, and informative medical records;
9) Commit to lifelong learning;
10) Collaborate and communicate with other specialists to identify solutions for problems related to obstetrics and gynecological disorders;
11) Possess high ethical and moral standards when dealing with patients, their families, and colleagues.

## Features of the Curriculum

1) Philosophical Orientations
   - Competency-based;
   - Graded responsibility for physicians;
   - Better supervisory frameworks;
   - Demarcations of targets to be be achieved at each stage of training;
   - Core curriculum with elective and selective options;
   - Independent learning within formal and informal structures.

2) Expanded Range of Competencies
   - Balanced representation of knowledge, skills, and attitudes;
   - Incorporation of new knowledge and skills.

3) Evidence-Based Approach
   - Demographic data (e.g., disease prevalence);
   - Practice data (e.g., procedures performed);
   - Patient profile (e.g., outpatient vs. inpatient);
   - Catered toward future needs.

4) Holistic Assessment
   - Strong emphasis on continuous assessment;
   - Balanced assessment methods;
   - Logbook to support learning and individualized assessment;
   - Built-in formative assessment with constructive feedback.

## Definitions Used in the Curriculum

### CanMEDS Competencies

**Medical Expert**
As medical experts, physicians integrate all CanMEDS roles, applying medical knowledge, clinical skills, and professional judgment when providing patient-centered care. The medical expert has the central physician role in the CanMEDS framework.

**Communicator**
As communicators, physicians effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the patient encounter.

**Collaborator**
As collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.

**Manager**
As managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of thehealthcare system.

**HealthAdvocate**
As health advocates, physicians responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.

**Scholar**
As scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as to the creation, dissemination, application, and translation of medical knowledge.

**Professional**
As professionals, physicians are committed to the health and well-being of individuals and society through ethical practice, professionally led regulation, and high personal standards of behavior.

## Assumed Knowledge

Subjects that have been studied in undergraduate studies as well as knowledge and skills gained during undergraduate studies

## Knowledge

Familiarity with someone or something, which can include facts, information, descriptions, or skills acquired through experience or education

## Attitude

A behavior that is an observable activity, cumulative responses to internal or external stimuli, action or reaction to any material under given circumstances.

## Competency

Possession of a required knowledge, skill, or attitude

## Core

Specific knowledge, skill, or attitude that is essential to maternal fetal medicine practice

## Mastery

Expert knowledge, skill, or attitude

### Universal

Knowledge, skill, or attitude that is not specific to maternal-fetal medicine, but is universally needed for clinical practice

### Skills

Competence in performance and dexterity for procedures and surgeries

### Block

Four weeks per rotation block

# TRAINING REQUIREMENTS

## General Training Requirements for a Fellow

- Applicants should fulfill all admission requirements set by the SCFHS
- Fellows shall abide by the training regulations and obligations set by the SCFHS
- Training is a full-time commitment. Fellows shall be enrolled under full-time, continuous training for the duration of the program
- Training is to be conducted by institutions accredited by the SCFHS for instructing trainees in the subspecialty of maternal-fetal medicine
- Applicants should fulfill all requirements set forth by the Saudi Commission for health specialties and the scientific group of MFM
- Trainees shall be actively involved in patient care, with a gradual progression toward increased responsibility

## General Training Requirements for the Center

1) For the center to be accredited for providing fellowship training in Maternal Fetal Medicine, the following criteria must be fulfilled:
   - The minimum number of MFM consultants is two;
   - The obstetric ultrasonography unit should be staffed, supervised, and run by MFM consultants;
   - A minimum of 3000 obstetric scans conducted annually;
   - A minimum of 50 invasive procedures performed per fellow annually;
   - Level III neonatal intensive care unit availability;
   - Presence of genetics service with availability of genetic diseases testing.
2) Centers fulfilling the above criteria can be considered as suitable training centers after evaluation by the fellowship board of directors.
3) The number of fellows should not exceed 1 fellow per two MFM consultants annually, to a maximum of 1 fellow per MFM consultant at any given time.

## General Training Instructions

- This is a three-year, full-time training program. Comprehensive training includes inpatient, labor ward, ambulatory, and emergency room care;
- Trainees are involved in direct patient care under the supervision of a consultant, with a gradual progression of responsibilities;
- Regular and punctual attendance is necessary for instructional and learning sessions. Minimum attendance of 75% is necessary for promotion to higher levels of fellowship training;
- Continuous effort is essential to achieve maximal learning during “on-the job” experience;
- Trainees must commit to being knowledgeable about the latest research and events in the field of maternal-fetal medicine;
- Annual leave should not exceed 25% of the core-program rotation, and fellows are not permitted to take annual leave during the non-core rotations of the training program;
- The fellow should spend a minimum of 6 blocks outside the main training center, to a maximum of 50% of the blocks, and only after the approval from the board of directors;
- On-call duty shall include a minimum of two to four times per block for all trainees; The on call periods are 24-hours in length. Fellows are also required to facilitate proper endorsement to ensure continuity of patient care

# PROGRAM STRUCTURE

## Rationale

The FTP-MFM, which is supervised by the SCFHS, is committed to a competency-based curriculum that provides the highest level of clinical training, education, and research for the development of future MFM consultants.

## Mission

To graduate competent, safe, skilled, and knowledgeable specialists capable of independent functioning in the field of MFM

## Overall Goal

At the end of the training, successful fellows will have a broad-based understanding of the core knowledge, skills, and abilities in MFM. He/she will be capable of functioning independently as a Consulting physician in all matters relating to the diagnosis and medical/surgical management of MFM patients.

## Structure of the Training Program

### The Program Director

The program director must dedicate no less than 4 hours per week to the administrative and educational activities of the maternal-fetal medicine educational program; he/she will receive institutional support for this task.

### Trainee

The three-year postgraduate training program under the subspecialty of maternal-fetal medicine is divided into two levels:

1) Junior level of training: years F1–F2
2) Senior level of training: year F3

- The junior level of training years is designed to provide core training in MFM practice, together with rotations in selected specialized department such as genetics, ICU, NICU, and pathology;
- After successful completion of the junior level years, trainees will advance to senior level when more responsibilities and independence will be given as a chief fellow.
- 
- Trainees are required to satisfactorily complete all assigned rotations for each academic year. Successful completion of rotations requires approval by the trainee's direct supervisor(s) and the Program Director.

### Chief Fellows

Within the final 12 months of training, it is preferable for fellows to serve for 6 to 12 months as a chief fellow (appointed by the program director). The clinical and academic experience garnered while serving as chief fellow inculcates effective leadership skills.

## General Framework of the Required Rotations

Yearly planning for every trainee is highly recommended. Scheduling rotations will provide equal opportunity for all trainees and avoid conflict or dissatisfaction.

| ROTATION | DURATION (block = 4 weeks) | GENERAL PRINCIPLES AND REMARKS |
|---|---|---|
| First Year (F1) | | |
| Clinical MFM blocks | 4 blocks | Orientation about program content and assessment methods by the fellowship training program director<br>Orientation to different clinical areas<br>Clinical duties (see Appendix) 1) 1.1) |
| US/procedure blocks | 4 blocks | See Appendix 1: 1.2 |
| Research block | 2 blocks | See Appendix 1: 1.3 |
| NICU | 1 block | See Appendix 1: 1.4 |
| Critical Care Obstetrics | 1 block | See Appendix 1: 1.5 |
| Obstetrical Pathology | 1 block | See Appendix 1: 1.6 |
| Second Year (F2) | | |
| Clinical MFM blocks | 4 blocks | See Appendix 1: 1.1 |
| US/procedure blocks | 4 blocks | See Appendix 1: 1.2 |
| Research block | 2 blocks | See Appendix 1: 1.3 |
| Medical Genetics | 2 blocks | See Appendix 1: 1.7 |
| Elective | 1 block | See Appendix 1: 1.8 |
| Third Year (F3) | | |
| Clinical MFM blocks | 4 blocks | See Appendix 1: 1.1 |
| US/procedure blocks | 4 blocks | See Appendix 1: 1.2 |
| Research block | 2 blocks | See Appendix 1: 1.3 |
| Elective | 3 block | See Appendix 1: 1.8 |
| Rotations can be taken in any approved center of the SCFHS with minimum requirement of six-month rotation outside the home institution. | | |

## Overall Competency

**Continuum of Learning**

The expectation is that each stage of learning should confer specific levels of competency. This is accomplished through structured, competency-based training program, with graded progressive responsibility, from year 1 to year 3, and with supervision and monitoring by dedicated consultants. The trainees will be closely monitored and objectively assessed throughout the program, by continuous objective assessment tools, to ensure that the desired training objectives are being met.

**The two levels of knowledge and proficiency are the following:**

### Core Level Training: F1 to F2 (26 blocks /104 weeks)

Entails mastering high-priority topics in maternal-fetal medicine by the end of the second year of training (F2). The first year is dedicated to basic patient care and the foundations of the subspecialty disciplines. In the second year, mastery of the subspecialty with increasing responsibility for patient management is expected, and the fellow will be promoted to senior level (master level training) provided that he/she has successfully achieved at least a score of 70% on the evaluation for the first two years.

### Master Level Training: F3 (13 blocks / 52 weeks)

Junior (F1–F2) fellows are expected to know the topics taught during this training period. As seniors, fellows (F3) are expected to master the topics and achieve full competency in patient management. By the third year, trainees make the transition from assisting in patient care to assuming more responsibility for the care of the patient. In a gradual fashion, trainees are expected to develop competence and proficiency in diagnostic ability, technical skills, patient management, and professionalism. Trainees should also be able to function as competent practitioners; sufficient knowledge and skills will have been developed to manage emergency situations under the direct supervision.

**Core Clinical Problem List and Representative Diseases**

Core Clinical Problems (CCP) might include: symptoms, signs, laboratory/investigation results, and referrals. Priority is given to conditions and diseases that are common, life threatening, treatable, or preventable.

## Educational Objectives of the Program

The CanMEDS Physician Competency Framework. Essentially, CanMEDS is an initiative to improve patient care. The focus of CanMEDS is on articulating a comprehensive definition of the competencies needed for medical education and practice. Today, the CanMEDS model for physician competence is being adapted around the world as well as in other professions. The CanMEDS framework is organized around seven roles: medical expert (central role), communicator, collaborator, health advocate, manager, scholar and professional. The CanMEDS competencies have been integrated into the SCFHS standards, objectives of training, and final in-training evaluations. CanMEDS explicitly presents the abilities that have long been recognized in highly skilled physicians and constantly updates them for today's and tomorrow's medicine.

By the end of the training (F3), the trainee will have acquired the following competencies, as detailed by the CanMEDS framework:

## Medical Expert

- Establishes and maintains clinical knowledge and skills appropriate for maternal- fetal medicine;
- Has an awareness of his or her capabilities, responsibilities, and limitations;
- Recognizes and responds to the ethical dimensions in medical decision-making
- Demonstrates compassionate and patient-centered care;
- Able to elicit a relevant, concise, and accurate history for accurate diagnosis and proper management;
- Able to conduct a focused, relevant, and accurate physical examination for accurate diagnosis and proper management;
- Able to select medically appropriate investigative methods in a resource-effective and ethical manner, including imaging techniques and laboratory investigations;
- Demonstrates an understanding of the value and significance of laboratory, radiological, and other diagnostic studies;
- Demonstrates the ability to integrate findings that generate a differential diagnosis and a management plan;
- Learns the importance of an adequate record-keeping system as a tool in diagnosing medical problems, managing treatments, and assessing quality of care;
- Obtains appropriate informed consent for therapies;
- Lists and discusses the indications, contraindications, types, variations, complications, risks and benefits of surgical and non-surgical treatments;
- Activates timely and appropriate consultations with other health professionals;
- Arranges for follow-up care.

### A. Clinical Knowledge

Fellows are expected to attain knowledge and competency in comprehensive management of core topics. These topics should be discussed at bedside, group discussions, collaborative meetings, journal clubs, and/or presented as lectures by experienced tutors. The following are the core topics:

I. Reproduction and Developmental science

- Embryology and abnormal deviations;
- Human conception;
- Normal development of the fetus and placenta and abnormal deviations;
- Maternal and fetal physiology during human pregnancy;
- Genetics and the embryology of pregnancies.

II. Maternal Fetal Medicine

1) Maternal medical complications in current pregnancy or pre-pregnancy:

- Hypertensive disorders:
  - HELLP syndrome;
  - Accelerated hypertension (chronic or acute) with increasing requirements for medications;
  - Evidence of severe gestational hypertension/preeclampsia with adverse features;

- IUGR, antepartum hemorrhage.

- Pre-gestational diabetes mellitus (DM):
  - Pre-pregnant DM (Type I or Type II) with maternal complications;
  - Fetal involvement (growth disturbance or anomalies);
  - IUGR/Oligohydramnios
- Maternal Cardiac disease at any gestational age:
  - American Heart Association classification II or III;
  - History of valve replacement or surgical repair;
  - Concerns about effects at delivery;
  - Maternal arrhythmia requiring treatment.
- Gastrointestinal disorders:
  - Ulcerative colitis or Crohn's disease unresponsive to treatment;
  - Requiring TPN and long term dietary counseling.
- Maternal malignancy at any gestational age:
  - Disease coincident with pregnancy resulting in unstable maternal condition, requiring chemotherapy, radiation therapy or surgery during pregnancy or possibly requiring preterm delivery to facilitate treatment.
- Maternal renal disease:
  - With deterioration of renal function;
  - With associated hypertension;
  - Transplants;
  - Previous transplant of any major organ at any gestational age.
- Maternal neurological conditions at any gestational age;
  - AV malformations;
  - Aneurysms;
  - Previous cerebrovascular accident;
  - Refractory seizure disorders;
  - Paraplegia or quadriplegia;
  - Maternal spina bifida;
  - Muscular dystrophy or other neuromuscular disorders;
  - Multiple sclerosis at any gestational age.
  - Spina bifida
  - Paraplegia/quadriplegia
- SLE Connective tissue disorders at any gestational age:
  - /Rheumatoid arthritis/mixed connective tissue disorders.
- Antiphospholipid Antibody syndrome $\leq$ 34 weeks with:
  - Previous late perinatal loss;
  - Previous IUGR/abruption;
  - Previous arterial or venous thrombosis.
- Perinatal infections or risk of congenital infections such as:
  - Perinatal infection with syphilis, tuberculosis, parvovirus, listeria, cytomegalovirus at any gestational age;
  - Third trimester exposure to varicella, HIV;
  - First trimester exposure to rubella, varicella, toxoplasmosis.
- Significant respiratory disorders:
  - Cystic fibrosis.
- Hematological disorders at any gestational age such as:

- Thrombophilia other than APAS;
- Hemoglobinopathy;
- Clotting disorders (factor deficiencies, severe ITP).

- Maternal obesity and pregnancy:
  - Obesity and pregnancy complications;
  - Pregnancy following bariatric surgery.
- Psychiatric illness:
  - Pregnancy with psychiatric disease;
  - Postpartum psychiatric illness.

2) Obstetrical Complications in a Previous Pregnancy:

- Prior PPROM and Preterm labor and delivery  32 weeks;
- Prior second trimester gestational hypertension with proteinuria and adverse conditions requiring delivery  32 weeks;
- Prior poor perinatal outcome; Prior stillbirth;
- Prior neonatal demise

3) Fetal Medicine:

- Abdominal wall defect: omphalocele, gastroschisis, Pentalogy of Cantrell, bladder extrophy
- Amniotic bands;
- Central nervous system malformation;
- Congenital heart defect;
- Cystic hygroma;
- Suspected fetal viral infections (CMV/Parvovirus B19/Toxoplasmosis);
- Congenital Diaphragmatic hernia;
- Facial abnormalities: cleft lip and/or palate;
- Fluid collection in fetuses: ascites, pleural effusion or pericardial effusions, and hydrops;
- Gastrointestinal anomalies:
  - Obstruction such as duodenal atresia;
  - Other GI obstructions presenting with dilated bowel loops.
- Intrauterine growth restriction (IUGR) <26 weeks;
- Limb anomalies;
- Lung pathology such as CCAM/CPAM or pulmonary sequestration;
- Microcephaly (HC < 3%);
- Fetal body masses: Neck, face, back (such as sacroccoccygeal teratomas);
- Neural tube defect;
- Obstructive uropathy:
  - Hydronephrosis > 10 mm;
  - Bilateral hydroureters
  - Megacystis
- Oligohydramnios detected before 26 weeks gestation;
- Polyhydramnios;
- Renal anomalies:
  - Dysplastic;
  - Multicystic;
  - Agenesis.

- Skeletal dysplasia;
- Red cell immunizations and its complications;
- Neonatal alloimmune thrombocytopenia (NAIT) and other platelets disorders.

## B. Procedures and Surgical Principles

The trainee should acquire the necessary skills during his or her training period through skills grading. The appropriate use of diagnostic and therapeutic procedures/surgeries is indicated by:

- Demonstrating thorough knowledge of a patient's condition/disease prior to treatment;
- Understanding the indications, risks, benefits, and limitations of a specific invasive prenatal procedures or surgery in MFM;
- Obtaining informed consent (as per hospital policies);
- Demonstrating the required knowledge about the surgical procedure;
- Documenting correctly and precisely the information related to performed procedures and their outcomes;
- Demonstrating appropriate knowledge about recommended pre- and postsurgical prophylaxes that guarantee patient safety;
- Appropriate postoperative follow-up with patients (i.e., communicating about the procedure findings, relating long-term sequelae, arranging for adequate aftercare);
- Identify and report any adverse event to the appropriate authority in a timely and professional manner.

The fellow should be exposed to the following surgical procedures:

1) Cesarean sections (elective and emergency);
2) Classical cesarean sections;
3) Termination of pregnancies;
4) Abdominal/Cervical Cerclage.

## C. Diagnostic and Therapeutic Prenatal Procedures

The trainee should receive formal theoretical and practical training on the following topics:

- Ultrasonographic Imaging including:
  - Dating and viability;
  - First trimester screening scan;
  - Nuchal translucency (NT);
  - Fetalbiometry;
  - Genetic sonogram (18 – 22 weeks);
  - Biophysical profile;
  - FetalandmaternalDopplerstudies;
  - Abdominal/transvaginal/translabial ultrasonographic scan for obstetrical indications;
  - Multiple pregnancy (including chorionicity);
  - 3Dimensional/4Dimensional scan;
  - Fetal echocardiography.
- Selective Multi-fetal pregnancy reduction;
- Amniocentesis mid trimester (e.g. genetic, lung maturity, culture);
- Late amniocentesis (e.g. genetic, lung maturity);
- Amnioreduction;
- Amnioinfusion;

- Chorionic villous sampling (CVS);
- Fetal blood sampling (FBS)/Cordocentesis;
- Intrauterine fetal blood transfusion (IUT);
- Fetal thoracocentesis;
- Fetal thoraco-amniotic shunt placement;
- Fetal vesicocentesis;
- Fetal vesico-amniotic shunt placement;
- Cephalocentesis (trans-abdominal and trans-cervical);
- Fetoscopy procedures.

By the end of each year, the trainee is expected to be competent in performing the following procedures/surgeries according to their level:

## Professional Skills Grading

P1: Observe/Assist
P2: Perform under supervision

| PROCEDURES | Skill Grade | | |
|---|---|---|---|
| | F1 | F2 | F3 |
| Elective cesarean section | P2 | P2 | P2 |
| Emergency cesarean section | P2 | P2 | P2 |
| Second stage of labor cesarean section | P1 | P2 | P2 |
| Cesarean section for multiple pregnancy | P2 | P2 | P2 |
| Cesarean section for malpresentation | P1 | P2 | P2 |
| Cervical suture: elective | P1 | P2 | P2 |
| Cervical suture: urgent/emergent | P1 | P2 | P2 |
| Instrumental vaginal delivery | P2 | P2 | P2 |
| CVS | P1 | P2 | P2 |
| Amniocentesis | P2 | P2 | P2 |
| Fetal blood sampling (FBS)/cordocentesis | P1 | P1 | P2 |
| Intra-uterine fetal blood transfusion (IUT) | P1 | P1 | P2 |
| Amniodrainage | P2 | P2 | P2 |
| Drainage of fluid compartments (bladder/ ascites/ effusion, etc.) | P1 | P2 | P2 |
| Shunting procedures | P1 | P1 | P1 |
| Fetal surgery/fetoscopy | P1 | P1 | P1 |
| | | | |

### Communicator

The fellow will be able to establish a therapeutic relationship with patients and/or family members, as appropriate. He or she will be able to perform the following:

- Encourage patient's participation in decision-making in consultative, elective, and emergent situations;
- Listen to patients, answer their questions, and decrease their anxiety;
- Demonstrate respect and empathy in relationships with patients;
- Gather sufficient information from the patient, family members, and/or medical personnel to identify all issues that will have implications for antenatal, delivery, and preoperative management;
- Impart sufficient information to patients and appropriate family members or delegates to allow a complete understanding of the implications, options, risks, and benefits of the planned procedure;
- Obtain complete informed consent for MFM care.
- Be able to convey, appropriately and professionally, bad news to patients and family members.

### Collaborator

The fellow will be able to perform the following:

- Function in the clinical environment using the full abilities of all team members;
- Coordinate the professional care of pregnant women with members of the OB/GYN team, operating room, emergency room, ICU staff, and physicians in other subspecialties;
- Evaluate urgent and crisis situations (e.g., severe bleeding, uterine rupture), initiate management, and ask for help from senior fellows at the appropriate time;
- Resolve conflicts or provide feedback where appropriate;
- Communicate effectively with MFM team members and other subspecialties to provide optimal patient care;
- Prepare and present cases at multidisciplinary meeting involving MFM team with other specialties (e.g. Neonatology, Genetics, Pediatric Cardiology, Pediatric Surgery, etc.). The fellow is expected to discuss prenatal approach and interventions, decision and time of delivery, outline and document immediate and short term postnatal management, conduct counseling session with the couple with in-depth discussion of lethal fetal conditions and decision of resuscitation.

### HealthAdvocate

The fellow will be able to perform the following:

- Recognize individual and systemic issues that impact MFM care and patient safety;
- Communicate identified concerns and risks to patients, other healthcare professionals, and administration as applicable;
- Intervene on behalf of individual patients and the system as a whole regarding quality of care and safety;
- Identify and react to risks to healthcare providers specifically, including, but not limited to, hazards in the workplace environment;

- Implement standards and guidelines related to MFM practice.

### Manager

The fellow will be able to perform the following:

- Demonstrate knowledge of the management of MFM patients;
- Demonstrate knowledge of national guidelines concerning MFM practice;
- Record appropriate information for MFM consultations provided;
- Demonstrate principles of quality assurance, and be able to conduct morbidity and mortality.
- Utilize personal and outside resources effectively to balance patient care, continuing education, practice and personal activities;
- Participate in the assessment of outcomes of patient care and practice, including quality assurance (QA) methods;
    - Maintain personal records of experiences and outcomes (i.e., log of experience);
    - Participate in appropriate case reviews.

### Scholar

The fellow will be able to perform the following:

- Develop and maintain a personal learning strategy that will lead to additional certifications;
- Seek out and critically appraise literature to support clinical care decisions; practice evidence-based application of newly acquired knowledge;
- Contribute to the appropriate application, dissemination, and development of new knowledge;
- Teach medical students and patients using the principles and methods of adult learning.

### Professional

The fellow will be able to perform the following:

- Deliver the highest quality patient care with integrity, honesty, and compassion;
- Fulfill the ethical and legal aspects of patient care;
- Maintain patient confidentiality;
- Demonstrate appropriate interpersonal and professional behavior;
- Recognize personal limits through appropriate consultation (with staff supervisors, other physicians, and other healthcare professionals) and show appropriate respect for those consulted;
- Accepts constructive feedback and criticism, and implements appropriate advice;
- Continually reviews personal and professional abilities and demonstrates a pattern of continued development of skills and knowledge through education.

# ACADEMIC PROGRAMS

## Teaching and Learning Opportunities

### General Principles

- Teaching and learning is structured and designed to foster more responsibility for self-directed learning;
- Every week, at least four hours of formal training time will be reserved;
- Each trainee must have an assigned mentor in the training center.

Formal teaching time is an activity that is planned in advance with an assigned tutor, time slot, and venue. Formal teaching time excludes bedside teaching, clinic postings, and includes departmental/hospital scientific activities such as:

- Morning reports or case presentations;
- Morbidity and mortality reviews;
- Journal clubs;
- Lectures/ tutorials;
- Hospital grand rounds and other CMEs;
- Simulation/standardized patients and workshops.

## Learning Resources

### Textbooks

- Fetology, by Bianchi, Crombleholme, and D'Alton
- High Risk Pregnancy: Management Options, by James, Steer, Weiner, and Gonik
- Infectious Diseases of the female genital tract, by Sweet and Gibbs
- Maternal Fetal Medicine, by Creasy and Resnik
- Medical Complications during Pregnancy, by Burrow and Ferris
- Medical Disorders during Pregnancy, by Barron and Lindheimer
- Medicine of the Fetus and Mother, by Reece and Hobbins
- The Unborn patient, by Harrison, Evans, Adzick, and Holzgreve
- Handbook of Obstetric Medicine, by Catherine NelsonPier

### Guidelines

- Society of Maternal Fetal Medicine (SMFM)
- Society of Ultrasound in Obstetrics and Gynecology (ISUOG)
- Royal College of Obstetricians and Gynecologists (Green-top)
- National Institute for Health and Clinical Excellence (NICE)
- American Congress of Obstetricians and Gynecologists(ACOG)
- The Society of Obstetricians and Gynecologists of Canada (SOGC)

## Journals

- American Journal of Obstetrics & Gynecology
- Obstetrics and Gynecology
- British Journal of Obstetrics & Gynaecology
- Obstetrics & Gynecology Clinics of North America
- Clinical Obstetrics & Gynaecology
- International Journal of Gynecology & Obstetrics
- Ultrasound in Obstetrics & Gynecology

# ASSESSMENT/EXAMINATION RULES AND REGULATIONS

Evaluations and assessments throughout the program are carried out in accordance with the Commission's training and examination rules and regulations. The process includes the following steps:

## Annual Assessment

**Continuous Appraisal**

This assessment is conducted toward the end of each training rotation throughout the academic year, and at the end of each academic year as a continuous assessment in the form of a formative and summative evaluation.

**Formative Continuous Evaluation**

To fulfill the CanMEDS competencies based on the end-of-rotation evaluation, the fellow's performance will be evaluated jointly by relevant staff for the following competencies:

1) Performance of the trainee during daily work and on calls;
2) Performance and participation in academic activities;
3) Performance in a 10 to 20 minute direct observational assessment of trainee–patient interactions. Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee–patient encounter;
4) Performance of diagnostic and therapeutic procedural skills by the trainee. Timely and specific feedback for the trainee after each procedure is mandatory;
5) The CanMEDS-based competencies end-of-rotation evaluation form must be completed within two weeks following the end of each rotation (preferably in electronic format) and signed by at least two consultants. The program director will discuss the evaluation with the fellow, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within four weeks following the end of the rotation;
6) The assessment tools, in the form of an educational portfolio (i.e., monthly evaluation, rotational mini-CEX and CBDs, DOPS, MSF);
7) Academic and clinical assignments should be documented on an annual basis using the electronic logbook (when applicable). Evaluations will be based on accomplishment of the minimum requirements of the procedures and clinical skills, as determined by the program;

**Summative Continuous Evaluation**

1) This is a summative continuous evaluation report prepared for each fellow at the end of each academic year (annual ITER);
2) An ITER should be submitted after completion of each rotation and submitted by the program director, upon approval by the fellowship training committee, for each trainee during the specific training year based on a series of workplace-based assessments considered relevant by the specialty. Such an assessment might be multi-source feedback, mini-CEX, DOPS, or a combination;
3) An annual ITER is the average of the ITERs during the specific training year, which might also involve OSCE, SOE, research activity, international examinations and/or academic assignments, in accordance to the SCFHS examination rules and regulation.

## Promotion Examinations

The end-of-year examination will be limited to F1&2 fellows. The number of examination items, eligibility, and passing score are established in accordance with the Commission's training and examination rules and regulations. Examination might include OSCE/SOE component, details and a blueprint are published on the Commission website, www.scfhs.org.sa

## Final In-training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

In addition to the local supervising committee's approval of the completion of the clinical requirements (via the fellow's logbook), the program directors prepare a FITER for each fellow at the end of the final year of fellowship (F3). This could also involve clinical or oral examinations or completion of other academic assignments.

## Final MFM Fellowship Examination (Final Saudi MFM Fellowship Examination)

The final Saudi Board examination consists of two parts:

1. **Written Examination**

   This examination assesses the trainee's theoretical knowledge base (including recent advances) and problem-solving capabilities in the Maternal-Fetal Medicine specialty; it is delivered in MCQ format and is held at least once per year. The number of examination items, eligibility, and passing score are established in accordance with the Commission's training, and examination rules and regulations. Examination details and a blueprint are published on the Commission's website, www.scfhs.org.sa

2. **Oral Structure Clinical Examination (OSCE):**

   This examination assesses a broad range of high-level clinical skills, including data gathering, patient management, communication, and counseling. The examination is held at least once per year, as an objective structured clinical examination (OSCE) in the form of patient management problems (PMPs). Eligibility and the passing score are established in accordance with the Commission's training and examination rules and regulations. Examination details and a blueprint are published on the Commission website, www.scfhs.org.sa

## Certification

A certificate acknowledging training completion will only be issued to the fellow upon successful fulfillment of all program requirements. Candidates passing all components of the final specialty examination are awarded the "Saudi Fellowship in Maternal-Fetal Medicine" certificate.

# APPENDICES

## Appendix 1: Rotations

### Maternal Fetal Medicine Clinical Rotation

**Goals:**
At the end of the fellowship (including attendance at teaching rounds and personal reading), the fellow will be able to act independently as a competent Maternal Fetal Medicine consultant for the benefit of patients and with the respect of colleagues and support staff. The fellow will be able to act both, as the principal caregiver and as a consultant physician.

**Objectives:**
At the end of the fellowship, the fellow will be able to:

#### Medical Expert

As Medical Experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes when providing patient centered care. Medical Expert is the central physician role in the CanMEDS framework.

1) Investigate, diagnose, and manage less common, but potentially serious peripartum complications including, but not limited to:
   - Severe, intractable hyperemesis gravidarum;
   - Incompetent cervix presenting in the second trimester;
   - Threatened preterm delivery before 28 weeks;
   - Maternal and fetal complications of tocolysis;
   - Difficult problems in multifetal pregnancies (including multifetal reduction and selective termination, twin to twin transfusion syndrome, intrauterine death of one twin, severe growth discordance, and extreme prematurity);
   - Extrauterine pregnancy in the second and third trimester;
   - Complicated peripartum hemorrhage (including placenta previa with suspected accreta; coagulopathy, amniotic fluid embolism, and massive blood replacement);
   - Gestational hypertension with proteinuria and adverse features presenting in the late second trimester or early third trimester, or requiring intensive medical management or developing HELLP syndrome or eclampsia;
   - Perinatal infectious diseases (including streptococcemia, HIV, TORCH, parvovirus, varicella and
   - hepatitis);
   - Severe or early onset intrauterine growth restriction;
   - Fetal hydrops, including fetal arrhythmia and red cell immunization;
   - Fetal anomalies, including their investigations, in utero treatment options, and their obstetrical implications (such as mode and timing of delivery);
   - Principles of second and third trimester termination of pregnancy.

2) Investigate, diagnose and manage medical and surgical disorders in relation to pregnancy. Such conditions include:
   - Hypertension;
   - Chronic renal disease;
   - Pyelonephritis;
   - Organ transplant;
   - Diabetes (preexisting and gestational);
   - Hypo and Hyperthyroidism;
   - Hypo and Hypercoagulable states, including thromboembolism;
   - Severe anemia and hemoglobinopathies;
   - Migraines and headaches;
   - Epilepsy;
   - Multiple sclerosis;
   - Pelvic neuropathies, Bell's palsy;
   - Myasthenia gravis;
   - Maternal heart disease (congenital, arrhythmia);
   - Asthma;
   - Pulmonary insufficiency;
   - Cholestasis of pregnancy;
   - Inflammatory bowel disease;
   - Appendicitis;
   - SLE and other connective tissue disorders;
   - Antiphospholipid antibody syndrome;
   - Maternal neoplasia;
   - Morbid obesity;
   - Psychiatric illnesses.

For these conditions, the following will be expected, when applicable:
   - Provide prepregnancy counseling to women with chronic medical conditions or using potentially teratogenic medications;
   - Establish a care plan for the pregnant women with a chronic medical condition;
   - Address specific issues related to the effect of the pregnancy on the natural history of the disease and the effect of the disease on the pregnancy;
   - Identify and initiate investigation and treatment of acute medical or surgical conditions, acute deterioration of chronic conditions or de novo chronic conditions presenting in pregnancy;
   - Understand the hemodynamic changes specific to the pregnancy and the early postpartum period, in relation to the cardiovascular chronic or acute conditions;
   - Offer postpartum follow-up to women at risk for certain medical complications related to the pregnancy (such as Sheehan syndrome, infectious complications after massive blood replacement, thromboembolic disease, etc.).

3) Actively participate and orchestrate critical care in the obstetrical patient, in conjunction with the appropriate consultants.
   - Be familiar with medical and surgical management of hypovolemic shock;
   - Initiate treatment for nonhypovolemic shock;

- Be capable of actively resuscitating the pregnant women in cardiorespiratory arrest (including successful completion of the ACLS course);
- Proceed with in utero resuscitation of the fetus compromised by acute maternal metabolic complications (such as ketoacidosis, severe asthma);
- Organize the safe transfer to the appropriate facility when indicated.

4) Understand the importance of psychosocial issues complicating pregnancy including:
   - Chemical dependency, harm reduction program, and their perinatal implications;
   - Domestic violence in pregnancy and its routine screening;
   - Long-term hospitalization or relocalization;
   - Psychiatric conditions of pregnancy and the peripartum period;
   - Issues related to the socioeconomically deprived, adolescent pregnant women.

5) Demonstrate technical skills in:
   - Emergency cervical cerclage;
   - Late second trimester medical terminations of pregnancy (optional);
   - Therapeutic amnioinfusion and amniodecompression;
   - Classical cesarean sections.

**Communicator**

As Communicators, physicians effectively facilitate the doctor patient relationship and the dynamic exchanges that occur before, during and after the medical encounter

- Establish rapport and therapeutic relationships with patients and families, including prepregnancy and antepartum consultations;
- Effectively facilitate a structured clinical encounter;
- Gather all relevant information about a condition, with consideration of patient's beliefs, concerns and experiences;
- Recognize the need to use language and terminology that the patient can understand, including recognizing the need for a translator when appropriate;
- Respect patient confidentiality and privacy;
- Understand and demonstrate the importance of cooperation and communication among health professionals involved in the care of individual patients, such that the roles of these professionals are delineated and consistent messages are delivered to the patients and their families;
- Deliver information to a patient and family, colleagues, and other professionals in a sensitive manner and in such a way that it is understandable, encourages discussion, and participation in decision making;
- Encourage discussions, questions, and interactions during the encounter;
- Effectively address challenging communication issues, such as obtaining informed consent, delivering bad news, addressing anger, confusion, and misunderstanding;
- Maintain clear, accurate, and appropriate records (e.g., written or electronic) of clinical encounters and therapeutic plans;
- Provide clear, organized, and timely information to the referring caregivers, verbally and in writing.

### Collaborator

As collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.

- Actively participate in a multidisciplinary team addressing complex medical and psychosocial issues;
- Arrange and participate in multidisciplinary meetings with other specialties (e.g. Endocrinology, Nephrology, Cardiology, etc.), both on regular and ad hoc basis in order to discuss challenging cases;
- Demonstrating leadership where appropriate;
- Involve appropriate consultants in a timely manner for optimal patient care;
- Provide ongoing communication to referring caregivers regarding patient progress;
- Demonstrate ability to establish the most appropriate care provider for the patient (referring physician, other physician, shared care, etc.);
- Support community practitioners through outreach, clinical advice, and appropriate transfers.

### Manager

As managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.

- Work collaboratively in the institution;
- Recognize the importance of quality assurance activities, participate in perinatal and neonatal mortality review committees;
- Understand the health care system as it is organized and the role of maternal fetal medicine in that system;
- Organize provincial perinatal transfers to the most appropriate facility, in a safe and cost-effective
- Manner;
- Use information technology effectively for patient care.

### Health Advocate

As health advocates, physicians responsibly use their expertise and influence in order to advance the health and wellbeing of individual patients, communities, and populations.

- Identify and advocate for the health needs of individual patients and groups;
- Identify determinant for health in the population and populations that are at risk;
- Provide prepregnancy planning for the mother and the fetus that decreases risks through appropriate interventions, such as medication changes, vaccinations or lifestyle changes;
- Work with patients to minimize long-term health risks that may have been uncovered by pregnancy complication (e.g. steps to prevent the development of Type 2 Diabetes in patients who had gestational diabetes or referral to the Healthy Heart program for patients experiencing hypertension or IUGR in their pregnancy).

### Scholar

As scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

- Maintain professional competencies through ongoing learning;
- Identify and utilize different sources of continuing education;
- Contribute to new knowledge by participation in clinical studies.

**Professional**

As professionals, physicians are committed to the health and wellbeing of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

- Demonstrate commitment to ethical and professional patient care;
- Demonstrate responsibility, punctuality, and respect for patients and others;
- Appropriately manage conflict of interest;
- Recognize and appropriately respond to ethical issues encountered in practice, including assisted reproductive technology (ART), termination of pregnancy;
- Practice patient confidentiality;
- Maintain appropriate relations with patients;
- Appreciate professional, legal, and ethical codes of practice.

By the end of the rotation, the fellow should be able to:

- Act as a consultant when caring for a referred woman;
- Review the information provided by the referring physician and identify the reason for referral;
- Obtain a detailed history from the woman, identifying the risk factors for the pregnancy;
- Perform a complete or partial physical examination, as indicated;
- Summarize the findings and discuss them with the woman/couple;
- Choose and arrange the appropriate investigations;
- Establish the options for ongoing care and determine a plan with the woman. This should include:
  - Decision on the most appropriate physician for her care (referring physician only, other physician [such as general obstetrician], shared care or total transfer of care);
  - Follow-up visits and further routine or specific investigations;
  - Referral to other specialties when appropriate;
  - Recommendation on the most appropriate place of delivery;
  - Decisions reflecting awareness of clinical guidelines and concerns of cost effectiveness;
- Understand the concept of prevention and use it in ongoing care, including postpartum
- and pre-pregnancy counseling;
- Dictate/write a detailed consultation report summarizing the risk factors identified and the recommendations for investigations, follow-up, and prevention;
- Verbally communicate with the referring physician when indicated;
- Reassess the maternal and fetal status in follow-up and modify the care plan accordingly;

**Rotation Format**

- 12 blocks of clinical rotation including:
  - Outpatient clinics in Maternal Fetal Medicine and other related clinics;
  - In–patient care including inpatients rounds, labor room coverage, and inpatient consultations.
- 2 - 4 calls per block

**Evaluation Informal**

- Direct feedback will be provided to the fellow after clinical encounters;
- “Mid-rotation” feedback by the rotation supervisor after the first 2 or 3 Clinical MFM blocks.

**Formal**

- Evaluations (ITER reports) will be collected from all preceptors involved in working with the fellow during the rotation, and reviewed by the rotation coordinator with the fellow at both mid rotation and end of rotation (face to face feedback sessions);
- At least one on-call rating form is required per clinical rotation;
- At least two case-based discussions (CBD) are required per clinical rotation;
- At least two mini-clinical evaluation exercise (mini-CEX) are required per clinical rotation;
- End of year/ End of fellowship written examination and OSCE/ SOE.

**Learning Resources (some examples for guidance only): Books:**

- Fetology, by Bianchi, Crombleholme, and D'Alton
- High Risk Pregnancy: Management Options, by James, Steer, Weiner, and Gonik
- Infectious Diseases of the female genital tract, by Sweet and Gibbs
- Maternal Fetal Medicine: Principles and Practice, by Creasy and Resnik
- Medical Complications during Pregnancy, by Burrow and Ferris
- Medical Disorders during Pregnancy, by Barron and Lindheimer
- Medicine of the Fetus and Mother, by Reece and Hobbins
- The Unborn patient: The Art and Science of Fetal Therapy, by Harrison, Evans, Adzick, and Holzgreve
- Handbook of Obstetric Medicine, by Catherine Nelson Piercy

## Ultrasonography, Prenatal Procedures, And Fetal Assessment Rotation

**Goals:**

This rotation is divided into three "4 block parts" and provides the necessary support for the development of the ability:

- To perform basic and complex diagnostic obstetrical ultrasonography (including basic fetal
- echocardiography);
- To provide guidance for and perform ultrasound-guided prenatal procedures;
- To perform complete assessments of fetal wellbeing, using all currently available methods.

**Objectives:**

At the end of the fellowship, the fellow will acquire the following expertise:

### Medical Expert

As medical Experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes when providing patient centered care. Medical Expert is the central physician role in the CanMEDS framework.

**General objectives**

In order to effectively develop the skills included in this rotation, the fellow is expected to establish and maintain knowledge related to:

- The principles of ultrasound physics and instrumentation;
- The use of evidence-based medicine in effective decision-making strategies.

**For first trimester ultrasonography:**

- Normal and abnormal embryonic growth;
- Normal ultrasonographic findings at 6-11 weeks, including determination of multifetal gestations and chorionicity;
- Normal fetal anatomy at 11-14 weeks;
- Obstetrical complications, which can result from abnormal placentation, as identified by sonographic and biochemical examinations in the first trimester;
- Prenatal screening using nuchal translucency, nasal bone, and other first trimester markers;
- The safe application of Doppler velocimetry in the first trimester.

**For second and third trimester ultrasonography:**

- Normal fetal growth and development, and transition from fetal to neonatal life;
- Fetal cardiovascular physiology, autonomic control of the fetal heart rate, fetal arrhythmia, and behavioral activity;
- Dynamics and disorders of amniotic fluid volume;
- Multiple gestation;
- Prenatal diagnosis and management of fetal growth aberrations;
- Fetal anomalies;
- Maternal diseases, which can result in abnormal fetal development, growth or biophysical parameters such as diabetes, hypertensive disorders, immunologic disorders, and infectious disorders;
- Obstetrical complications that can result in abnormal fetal development, growth or biophysical
- parameters, such as placental insufficiency, premature rupture of the membranes, antepartum hemorrhage, and prolonged pregnancy;
- Prenatal diagnosis, genetics, screening of aneuploidy, and metabolic disorders;

**For procedures:**

- Knowledge of core diagnostic and therapeutic procedures including amniocentesis, chorionic villus sampling (CVS), cordocentesis, intrauterine transfusion, amnioreduction, amnioinfusion, and fetal shunt placement.

**Specific objectives:**

- Ultrasonography: At the completion of the rotation, the fellow will be able to:
  - Demonstrate an understanding of the following basic ultrasound physics principles: o Image orientation, image optimization, time gain compensation (TGC), gain, focus, Doppler;
  - Display: grey scale, M mode, color, and pulsed wave Doppler; o Identification and compensation for artifacts;
  - Bioeffects/safety: thermal index, mechanical index, ALARA principle.
  - Demonstrate an understanding of the concept of ultrasonographic image optimization and be able to apply this knowledge in order to obtain a technically acceptable image by understanding:
  - Optimal transducer selection and frequency in 2D and Doppler modes;
  - Appropriate selection of imaging study and exam preset for the clinical situation.
  - Use a transabdominal, translabial, or endovaginal approach, as required;

- Perform a complete assessment within a reasonable time period (approximately 45 minutes);
- Perform, interpret and document an abnormal obstetrical ultrasonographic scan, recognizing the presence of pathology (whether fetal, placental, maternal uterine, cervical or adnexal) and expanding the scan appropriately;
- Recommend other relevant investigations as appropriate;
- Complete a written report detailing the findings and their significance, as well as any appropriate management recommendations.

- For first trimester ultrasonography: At the completion of the rotation, the Fellow will have completed the Fetal Medicine Foundation online course in the 11-14 w scan and be able to:
  - Perform, interpret and document a complete first trimester assessment, including assessment of anatomy and soft markers;
  - Recognize fetal anomalies;
  - Determine placental location, cord insertion, number of gestational sacs, and chorionicity in the multifetal gestation;
  - Assess adnexal and cervical anatomy;
  - Assess the nuchal translucency and other soft markers (including assessment of the nasal bone, measurement of the facial angle, assessment of the ductus venosus, and tricuspid flow);
  - Collate the images required for certification by the Fetal Medicine Foundation in the measurement of nuchal translucency.
- For second and third trimester ultrasonography and fetal echocardiography: At the completion of the rotation, the Fellow will be able to perform, interpret, and document a complete detailed second or third trimester ultrasonographic scan of a normal pregnancy, including the assessment of:
  - The number of gestational sacs and fetuses:
  - The chorionicity in multiple pregnancies;
  - Fetal viability, lie, presentation, and biometry;
  - Fine fetal anatomical details (including intracranial, thoracic, abdominal, and musculoskeletal anatomy);
  - The fetal heart anatomy, including the standard cardiac views (four chamber view, short axis view, ventricular outflow tracts, 3vessel view, and interventricular septum);
  - The amniotic fluid volume, fetal movement, tone, and breathing;
  - Maternal and fetal Doppler studies;
  - Placental location and morphology;
  - Maternal uterine, cervical, and adnexal anatomy.
- For fetal MRI:The fellow will observe and familiarize him/herself with the indications and imaging obtained by fetal MRI.
  - Fetal Assessment: At the completion of the rotation, the Fellow will be able to perform, interpret, and document a complete assessment of fetal wellbeing, using any of the following tools as indicated:
    - Non stress test (NST);
    - Biophysical profile (BPP);
    - Amniotic fluid volume assessment;
    - Umbilical artery Doppler and other fetal Doppler assessments (including middle cerebral artery, ductus venosus, and umbilical vein Doppler);

- Provide management recommendations based on normal, atypical or abnormal results of the above investigations.
- Prenatal Procedures: At the completion of the rotation, the Fellow will be able to:
  - Provide ultrasound guidance for and perform ultrasound-guided procedures, including amniocentesis (mandatory) and other optional procedures (which may include CVS, fetal aspiration, and shunt placement, feticide, cordocentesis, and intrauterine transfusion).
  - Complete a written report detailing the procedure.

**Communicator**

As Communicators, physicians effectively facilitate the physician patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.At the completion of the rotation, the Fellow will be able to:

- Explain the rationale for the use of ultrasonographic scanning, other tools for the assessment of fetal wellbeing, prenatal procedures, including advantages, disadvantages, and risks associated with each examination and procedure, so as to be able to obtain informed consent from patients;
- Effectively communicate the results of an ultrasonographic scan, an assessment of fetal wellbeing, or a procedure to the patient and family, demonstrating empathy and respect, and using appropriate language for their level of knowledge;
- Effectively communicate, verbally and/or in writing, the results of ultrasonographic scans, assessments of fetal wellbeing, and procedures to the caregiver in an appropriate and timely manner, taking into consideration the degree of urgency of the situation;
- Provide clear recommendations to care providers based on the results of the assessments
- performed;
- Effectively communicate with the clerical staff, allied health care professionals, and colleagues in a clear and respectful manner, verbally, and in writing;
- Effectively communicate with medical genetics and other counseling based services for optimal patient outcomes.

**Collaborator**

As Collaborators, physicians effectively work within a healthcare team to achieve optimal patient care. At the completion of the rotation, the fellow will be able to:

- Work effectively with all members of the team;
- Involve the appropriate consultants in a timely manner;
- Actively and effectively participate in a multidisciplinary team addressing medical and psychosocial issues complicating pregnancy;
- Arrange and participate in multidisciplinary meetings with appropriate specialties (e.g. Medical Genetics, Pediatric Surgery, Pediatric Cardiology, etc.) both on regular and ad hoc basis in order to discuss challenging cases;
- Cooperate where possible, with other disciplines in clinical research studies aimed at improving the quality of patient care, including giving information to eligible patients and families about ongoing research projects;
- Understand the use of other disciplines, such as cytogenetics and laboratory medicine for identifying specific risks for the patient.

### Manager

As Managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system. At the completion of the rotation, the fellow will be able to:

- Recommend investigations and diagnostic tests in a cost effective manner;
- Recognize the importance of quality assurance activities;
- Understand the role of Maternal Fetal Medicine with regards to fetal surveillance and prenatal diagnosis;
- Effectively use of information technology for patient care.

### Health Advocate

As Health Advocates, physicians responsibly use their expertise and influence to advance the health and wellbeing of individual patients, communities, and populations. At the completion of the rotation, the fellow will be able to:

- Provide women and families with information allowing them to choose the best possible prenatal tests for themselves;
- Provide recommendations to women, families, and care providers leading to the best possible fetal and maternal outcomes based on sonographic and biophysical assessments

### Scholar

As Scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge. At the completion of their rotation, the fellow will be able to:

- Provide effective clinical teaching, as well as teaching of the techniques related to obstetrical ultrasonography, assessment of fetal wellbeing, and ultrasound-guided prenatal procedures to trainees at all levels;
- Develop a regular program for personal CME in order to incorporate relevant clinical advances in patient care;
- Briefly discuss the role of learners in the hospital with patients and families.

### Professional

As Professionals, physicians are committed to the health and wellbeing of individuals and society through ethical practice, profession led regulation, and high personal standards of behavior.
At the completion of their rotation, the fellow will be able to:

- Exhibit an ethical framework for the delivery of the highest quality cost effective care;
- Understand professional obligations toward patients, families, and colleagues;
- Exhibit appropriate personal and interpersonal professional behaviors;
- Recognize and appropriately respond to ethical issues encountered in practice, including the consequences of ART and termination of pregnancy;
- Respect patient dignity, privacy, and confidentiality.

### Evaluation

**Informal**

Direct feedback will be provided to the fellow after clinical encounters with supervising sonographers or physicians

**Formal**

- Evaluations (ITER Reports) will be collected from all preceptors involved in working with the fellow during the rotation and reviewed by the rotation coordinator with the fellow;
- At least two direct observation of procedural skills (DOPS) is required per ultrasonography/procedure rotation;
- End of year/End of fellowship written examination and OSCE/ SOE.

### Learning Resources (some examples For guidance only)

**Books**

- Diagnostic Ultrasound: Principles and Instruments, by Frederick Kremkau, PhD (past president of
- the AIUM) seventh edition
- High Risk Pregnancy: Management Options, by James, Steer, Weiner, and and Gonik
- Maternal Fetal Medicine: Principles and Practice, by Creasy and Resnik
- Fetology, by Bianchi, Crombleholme, and D'Alton
- Medicine of the Fetus and Mother by Reece, Hobbins, Mahoney, and Petrie
- The Unborn Patient: The Art and Science of Fetal Therapy, by Harrison, Evans, Adzick, and Holzgreve
- Smith's Recognizable Patterns of Human Malformation, by Jones
- The Developing Human: Clinically Oriented Embryology, by Moore, Persaud, and Torchia

**Others**

Free online courses by the Fetal Medicine Foundation: in addition to The 11-13 weeks scan, the FMF offers the following courses:

- The 20-22 weeks scan
- Doppler ultrasonography
- Echocardiography
- Cervical assessment
- New online course based on a selection of videos of Fetal abnormalities

## Clinical And Basic Science Research Rotation

**Goals:**

At the end of the fellowship, the fellow will have participated in research that advances medical knowledge and the literature, in areas relevant to the subspecialty of maternal-fetal medicine. The fellow will be able to actively participate in a research team, as a co-investigator or principal investigator.

**Objectives:**

At the end of the fellowship, the fellow must be able to:

### Medical Expert

- Identify unanswered questions in the literature that require further investigation and that would ultimately aid in the care of patients;
- Develop content expertise in areas selected to be the subject of the fellow's research.

**Communicator**

At the end of the fellowship, the fellow must be able to:

- Communicate effectively and respectfully with members of the research team involved in each project;
- Communicate information with potential study subjects, including study information and the process of informed consent, where applicable;
- Disseminate findings locally and beyond, through publications and/or presentations, in a clear and concise manner.

**Collaborator**

At the end of the fellowship, the fellow must be able to:

- Work effectively with other members of the research team, including the project supervisor/senior author, statisticians, and research support staff;
- Access resources instrumental in carrying out research projects such as health records and local, provincial or national databases.

**Manager**

At the end of the fellowship, the fellow must be able to:

- Exhibit project planning and study design skills in order to ensure project feasibility;
- Conduct research in a timely manner;
- Design research projects that are cost effective.

**Health Advocate**

At the end of the fellowship, the fellow must be able to:

- Conduct research that will ultimately lead to improved patient care;
- Disseminate research findings, whether positive or negative, to advance the medical literature.

**Scholar**

At the end of the fellowship, the fellow must be able to:

- Create and disseminate new medical knowledge through the development of research projects;
- Understand the basic principles of epidemiology, biostatistics, and be able to apply them in evaluating journal articles, including participation in journal club;
- Develop a research hypothesis, protocol, and ethics submission, and then conduct the study
- (collect the data and analyze);
- Disseminate and defend findings by presenting once at the department's annual research day and once at a national (e.g. SOGC) or international (e.g. SMFM, IFMSS, ISUOG) meetings;
- Write up and submit to a peer reviewed journal (with or without publication), at least one piece of original research or one systematic review article.
- Identify areas for further research that flow from the results of the fellow's original research.

**Professional**

At the end of the fellowship, the fellow must be able to:

- Present research findings at professional meetings;

- Represent his/her institution through publication and presentations;
- Conduct all research in an ethical manner, approved by local research ethics boards;
- Demonstrate reliable work habits with responsibility towards staff, punctuality, and attendance at scheduled meetings.

### Rotation Format

- Six blocks over the three years fellowship will be dedicated to research;
- Complete a local/national research methodology/an evidence based medicine course during the fellowship, if not already done during residency;
- Carry out 1 research project consisting of:
  - One retrospective study (database or chart review), or
  - One prospective clinical study, or
  - One systematic review or meta-analysis of published data, or
  - One basic science study
- Present at least once at the department's annual research day and once at a national or international (e.g. SMFM, ISUOG, FMF, etc.) meeting;
- Submit to a peer reviewed journal (with or without publication) at least one piece of original research or one systematic review article;

### Evaluation

**Informal**

- Feedback will be provided to the fellow throughout the rotation based on the research activities performed;
- During training, evaluations will be provided directly to the fellow and to the rotation coordinator by all supervisors involved in the fellow's projects. They will be reviewed at the end of each blocks of the rotation.

**Formal**

- At least one presentation from the research submitted on a presentation rating form is required per year;
- End of year/End of fellowship written examination and OSCE/SOE;
- Submission of at least one complete manuscript at the completion of the fellowship.

## NICU Rotation

**Goals**

Effective management of the high-risk pregnancy requires an understanding of potential neonatal risks and an appreciation of the likely short and long term outcome for the newborn. During a successful rotation, the fellow will obtain a knowledge base about the high risk newborn, including prognosis for survival, assessment of the potential need for resuscitation or surgery, the use of various elements of neonatal intensive care such as assisted ventilation or parenteral nutrition, and potential needs for later special home and outpatient care. In addition, the subspecialty resident will be able to formulate, based on a neonatal perspective, an appropriate plan for anticipation of the high risk delivery. The subspecialty resident will also acquire an appreciation of the parental psychological stresses about the neonatal illness and the ethical dilemmas faced by the neonatal medicine team.

**Objectives**
At the end of the fellowship, the fellow will be able to:

**Medical Expert**
As Medical Experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes when providing patient-centered care. Medical Expert is the central physician role in the CanMEDS framework.

- With regards to neonatal resuscitation:
  - Identify, prior to delivery, situations associated with specific neonatal risk;
  - Anticipate neonatal problems and formulate an appropriate management plan;
  - Identify potential needs for resuscitation and know how to ensure that resuscitation resources are available;
  - Have a thorough knowledge of the principles and procedures involved in neonatal resuscitation and postnatal stabilization.

- With regards to neonatal care:
  - Acquire knowledge of the major management strategies and their implications for the extremely preterm and preterm newborn and their family. This includes acquiring an understanding of risks and benefits, potential long term sequelae, length, and costs of therapies;
  - Discuss the complications to the newborn arising from congenital abnormalities and from complications of pregnancy and delivery;
  - Appreciate the special needs of newborns potentially requiring surgery.

- With regards to neonatal follow up:
  - Understand how long term follow up data on survivors of neonatal intensive care is acquired, compiled, and reported;
  - Acquire knowledge of prognosis for survival and morbidity of infants with varying gestational age and illness;
  - Appreciate the implications of chronic illness arising from perinatal insults.

- With regards to administration of neonatal care:
  - Understand the potential for psychological stress that parents of newborns receiving intensive care may undergo, and be aware of available resources;
  - Be able to participate in prenatal consultation in order to address issues of outcome.

**Communicator**
As Communicators, physicians effectively facilitate the doctor patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

- Be able to provide counseling to patients and families using lay language, about the expected management strategies and potential outcomes for the newborn;
- Communicate effectively with other health care providers in regards to pregnancy and delivery management and planning, for pregnancies with identified complex issues, from a neonatal point of view;
- Provide support to women and families undergoing stresses associated within hospital neonatal stay or complicated neonatal outcomes.

### Collaborator

As Collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.

- Actively participate in a multidisciplinary team addressing complex neonatal issues, prenatally or postnatally;
- Participate and present cases in regular NICU/ MFM joint meetings;
- Involve appropriate pediatric and neonatology consultants in a timely manner for optimal patient care;
- Provide ongoing communication to referring caregivers regarding patient progress.

### Manager

As Managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.

- Understand the principles of regionalization of neonatal intensive care;
- Discuss the ethics of resuscitation in the care of extreme prematurity or fetal anomalies;
- Schedule their pediatric subspecialty follow-up clinics appropriately in order to optimize their learning experience.

### Health Advocate

As Health Advocates, physicians responsibly use their expertise and influence to advance the health and wellbeing of individual patients, communities, and populations.

- Appreciate the implications for the newborn about requiring intensive care of neonatal versus inutero transport.

### Scholar

As Scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

- Maintain professional competencies through ongoing learning;
- Identify and utilize different sources of continuing education.

### Professional

As Professionals, physicians are committed to the health and wellbeing of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

- Demonstrate commitment to ethical and professional patient care;
- Have an understanding of basic ethical principles in neonatology and the ethical dilemmas faced by the neonatal medicine team (such as limits of viability in neonatal care and withdrawal of intensive care);
- Demonstrate responsibility, punctuality, and respect for patients and others;
- Appropriately manage conflict of interest;
- Practice patient confidentiality;
- Appreciate professional, legal, and ethical codes of practice.

### Evaluation

**Informal**

The fellow will receive informal evaluation with comments and suggestions from attending staff during the rotation

**Formal**

- Towards the end of the rotation, each clinician having worked with the trainee will be asked to formally comment on the fellow's progress during the rotation. The evaluations (ITER report) will be reviewed by the rotation coordinator, and presented to the fellow for discussion in a summarized written format before submission to the fellowship program director.
- End of year/End of fellowship written examination and OSCE/SOE.

**Rotation Format**

- One blockrotation;
- Completion of a neonatal resuscitation course (NRPS), which should ideally be completed before the rotation.

**Some useful references:**

- Care of the High Risk Neonate (5th edition), by Klaus and Fanaroff

## Critical Care Obstetrics Rotation

**Goals**

At the end of the MFM Fellowship, the fellow will be able to act independently or in a shared care model as a competent Maternal Medicine consultant looking after critically ill obstetrical patients, with the respect of colleagues and support staff.

**Objectives**

At the end of the rotation, the fellow will be able to:

**Medical Expert**

Investigate, diagnose and manage, in conjunction with intensivists, potentially serious peripartum complications or serious medical disorders in pregnancy, including but not limited to the following conditions:

**Pregnancy specific:**

- Massive obstetric hemorrhage, including the management of a DIC;
- Severe preeclampsia with adverse features requiring intensive medical management in a critical care setting, including HELLP syndrome;
- Acute fatty liver of pregnancy;
- Amniotic fluid embolism;
- Obstetric sepsis, including severe chorioamnionitis;
- Anesthetic complications associated with pregnancy.

**Aggravated by pregnancy:**

- Respiratory disease;
- Aspiration;
- Pulmonary embolus;
- Severe asthmatic crisis;
- Severe pneumonia;

- Maternal heart disease (congenital, acquired, arrhythmia): peripartum cardiomyopathy, dissection, congestive heart failure from valvular heart disease, ACS, cardiac dysrhythmias
- Systemic diseases; diabetes (DKA/HHNKS);
- Pyelonephritis producing sepsis/ARDS;
- Connective tissue disease (SLE crisis, etc.).
- Nonspecific to pregnancy:
    - Early cardiopulmonary pre-arrest and arrest, including CPR and early ACLS (OBLS) based management, and peri-mortem cesarean section;
    - Trauma: blunt/penetrating/burns/falls/assault;
    - Sepsis / non-obstetric infections;
    - Overdose;
    - Neurological: seizures, intra-cerebral hemorrhage, stroke.

For these conditions, the following will be expected, when applicable:

- Address specific issues related to the effect of the pregnancy on the natural history of the disease and the effect of the disease on the pregnancy;
- Understand the hemodynamic changes specific to the pregnancy and the early postpartum
- Period, in relation to cardiovascular chronic or acute conditions;
- Understand procedures and monitoring techniques needed in patients admitted for intensive care, including the indications for and principles of noninvasive and invasive hemodynamic monitoring tools. This would involve reviewing as well as discussing potential adverse effects and any caveats for the pregnant/immediately postpartum patient with the intensivist;
- Be familiar with the management of fluid and electrolyte imbalances in the critically ill obstetrical patient.

**Communicator**

Demonstrate effective communication skills with patients, families, and health care team(s) of the critically ill patient that:

- Reflects empathy and respect;
- Provides clear and thorough explanations of diagnosis, investigations, and management;
- Effectively addresses challenging communication issues such as delivering bad news and addressing anger, confusion, and misunderstanding;
- Communicate effectively with clerical staff, allied health care professionals, and colleagues in a clear and respectful manner, verbally and in writing.

**Collaborator**

- Involve the appropriate consultants (obstetric medicine, anesthesiology, intensivists) in a timely manner;
- Understanding and demonstrating the importance of cooperation and respectful communication among health professionals in a critical care situation, such that roles are delineated and consistent messages are delivered to patients and their families;
- Actively and effectively participate in a multidisciplinary/interprofessional team addressing
- medical, psychosocial issues complicating pregnancy, and ICU stay, recognizing and respecting the diversity of roles, responsibilities, and competence of other professionals;
- Cooperate, where possible, in clinical research studies aimed at improving the quality of patients under his/her care, including giving information to eligible patients and families about ongoing research projects.

### Manager

- Choose investigations and diagnostic tests in an intensive care setting, in a cost-effective manner;
- Employ information technology appropriate for patient care;
- Understand the issues related to the organization of personal and equipment resources relevant to critical care obstetrics, pertinent to their practice of Maternal Fetal Medicine, in their local context.

### Health Advocate

- Provide consultative pregnancy care to women with medical conditions requiring ICU stay, with a focus at minimizing birth defects, neonatal morbidity/mortality, and the impact of the pregnancy on the woman's condition;
- Where appropriate, advocate for the health of the mother over the health of the fetus in critical care situations.

### Scholar

- Provide effective clinical teaching about the critically ill pregnant or recently pregnant woman to all levels of learners, including medical students, and fellows in other medical and surgical specialties;
- Develop a regular program for personal CME/MOCOMP in order to incorporate relevant advances in critical care obstetrics, applying critical appraisal to the evidence presented in addressing a clinical question.

### Professional

- Demonstrate a commitment to delivering the highest quality of care and maintenance of competence;
- Exhibit appropriate professional behaviors in the delivery of the highest quality cost-effective care to the critically ill obstetrical patient, inclusive of honesty, integrity, commitment, compassion, respect, and altruism;
- Understand professional obligations to patients, families, and colleagues;
- Recognize the principles and limits of patient confidentiality in the intensive care setting.

### Evaluation

**Informal**

- The fellow will receive informal evaluation with comments and suggestions from attending staff during the rotation.

**Formal**

- Towards the end of the rotation, each clinician having worked with the trainee will be asked to formally comment on the fellow's progress during the rotation. The evaluations (ITER reports) will be reviewed by the rotation coordinator, and presented to the fellow for discussion in a summarized written format before submission to the fellowship program director;
- Critical care obstetrics stations to be included in the OSCEs exams;
- At least one case-based discussion (CBD) or mini-clinical evaluation exercise (mini-CEX) on a critical care obstetric case is required per block;
- End of year/ End of fellowship written examination and OSCE/ SOE.

### Rotation Format

- One block rotation;
- Simulation scenarios with debriefing;
- Case-based discussions in critical care obstetrics topics.

### Learning Resources (some examples for guidance only):

**Books**

- Critical Care Obstetrics 5th Edition 2011, by M Belfort, G Saade, M Foley, J Phelan, and G Dildy
- High Risk Pregnancy: Management Options, by James, Steer, Weiner, and Gonik
- Medicine of the Fetus and Mother, by Reece and Hobbins

## Obstetrical Pathology Rotation

**Goals**

- To be able to determine, on the basis of clinical history and findings, as well as the observed appearance at delivery, which specimens should be examined in the laboratory;
- To be able to request relevant pathologic investigations and handle the tissues appropriately'
- To be able to interpret the test results to the patient.

**Expected knowledge base**

- Basic embryonic, fetal, and placental development;
- Basic classes of fetal, placental anomalies, and disorders.

**Objectives**

At the end of the fellowship, the fellow will be able to:

### Medical Expert

As Medical Experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes when providing patient centered care. Medical Expert is the central physician role in the CanMEDS framework.

- Identify embryonic and fetal specimens with:
  - Patterns of embryonic growth disorganization;
  - Anomalies that suggest common chromosomal errors, including monosomy X, trisomy 21, trisomy 18, trisomy 13, triploidy;
  - Common anomaly syndromes for which pregnancy terminations may be induced, including but not limited to neural tube defects, disruptions, renal anomalies, skeletal dysplasias;
  - Common causes of spontaneous second trimester losses such as abruption and infection.
- List the main investigative techniques available in fetal pathology and indicate when each could be useful.
- Provide a practical approach to placental examination by determining which placentas should be examined, how they should be examined (microbiologic cultures, cytogenetics, molecular studies), and what findings are of clinical significance.
- Ability to recognize the appearance of these placental conditions:
  - Ascending infection;
  - Meconium staining;

  - Hydrops;
  - Abruptio placentae;
  - Hypertensive disorders of pregnancy;
  - Anomalous development;
  - Cord abnormalities.
- Identify patterns of placentation with twins and indicate the significance for zygosity.
- Identify abnormalities of placentation of multiples that may be significant for fetal outcomes, including:
  - Cord variations;
  - Discordant development;
  - Discordant lesions;
  - Placental vascular anomalies.
- Identify by gross and microscopic examinations, the placental factors that correlate with poor pregnancy outcome.
- Identify the importance of placental examination in cases of stillbirth and abnormalities commonly observed in this setting.

**Communicator**

As Communicators, physicians effectively facilitate the doctor patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter

- Understand the information to be provided to the pathologist to facilitate interpretation of the findings;
- Be able to interpret the test results for the patient and their families.

**Collaborator**

As Collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.

- Actively participate in a clinical pathology team and understanding the roles of the different pathology team members;
- Participate with members of the pathology team as co-investigators for clinical and basic research applications.

**Manager**

As Managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.

- Understand the indications for placental pathology analysis, embryo, and fetal pathology analysis, and perinatal autopsies.

**Health Advocate**

As Health Advocates, physicians responsibly use their expertise and influence to advance the health and wellbeing of individual patients, communities, and populations.

Understand and be able to communicate with patients and families about autopsies, the potential benefit in understanding the reason for their pregnancy loss, and possible benefits to their future health.

### Scholar

As Scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

- Maintain professional competencies through ongoing learning;
- Identify and utilize different sources of continuing education;
- Attend and participate in autopsy review rounds.

### Professional

As Professionals, physicians are committed to the health and wellbeing of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

- Demonstrate commitment to ethical and professional patient care;
- Demonstrate responsibility, punctuality, respect for team members;
- Practice patient confidentiality;
- Appreciate professional, legal, and ethical codes of practice.

### Evaluation

**Formal:**

- Evaluation (ITER report) by the preceptors for the rotation collected and reviewed by the rotation coordinator with the fellow at the end of the rotation;
- Obstetrical pathology questions during written examination and OSCE.

### Rotation Format

- One block rotation

### Some useful references

- Developmental pathology of the embryo and fetus. Eds: Dimmick James E, Kalousek, and Dagmar K. 1992
- Placental pathology. Eds: F Krause, RW Redline, DJ Gersell, and DM Nelson, 2004

## Clinical Genetics Rotation

**Goals**

The practice of clinical genetics, as it applies to training in maternal fetal medicine, is based on knowledgeabout the basis of congenital anomalies, basic genetic principles, and an understanding of genetic disease, as it affects the maternal fetal unit. The practice also includes the ability to relay this information to the patient and family through the principles of genetic counseling. The fellow undergoing rotations in Medical Genetics will be trained in those aspects of medical genetics relevant to maternal fetal medicine, and will be capable of using this knowledge in the diagnosis and management of patients. After successful completion of the rotation, the fellow will be able to establish asppropriate pedigree, assess the genetic aspects of a variety of maternal and fetal conditions, and understand the conditions in which prenatal diagnosis would be of value. The fellow will have reached a reasonable level of competency in relaying genetic information to the patient. The fellow will recognize the conditions requiring further genetic assessment and will be aware of local genetic services.

**Medical Expert**

As Medical Experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes when providing patient centered care. Medical Expert is the central physician role in the CanMEDS framework.

- Understand the following disorders and genetic concepts, their presentation (prenatally and postnatally), prepregnancy and pregnancy related management, and their recurrence risks:
  - Common chromosomal disorders [aneuploidy and common microdeletion syndromes (such as 22q11 deletion)];
  - Common fetal anomalies and approach to the fetus with isolated versus multiple anomalies;
  - Multifactorial inheritance and the determinants of common malformations (such as neural tube defect, cardiac anomalies, cleft lip and palate);
  - Basic concepts of teratology, single gene inheritance (such as some skeletal dysplasia and muscular dystrophies, cystic fibrosis, and Fragile X Syndrome);
  - Carrier screening for autosomal recessive conditions (such as Tay Sachs disease, thalassemia, sickle cell disease), including routine screening and its applications;
  - Prenatal screening for aneuploidy and other disorders (such as neural tube defects), by serum and ultrasonographic testing.
- Understand the diagnostic tools available to detect the anomalies described above, including risks, benefits, complications, and interpretation. These include:
  - Detailed ultrasonography;
  - Chorionic villus sampling;
  - Amniocentesis;
  - Fetal cord sampling;
  - Direct and indirect DNA testing.
- Have an understanding of genetic conditions that may have an impact on pregnancy (Marfan Syndrome, Ehlers Danlos Syndrome, Phenylketonuria, etc.).
- Demonstrate the ability to elicit a relevant genetic history and draw an appropriate pedigree.
- Demonstrate the ability to formulate an appropriate differential diagnosis and plan an appropriate course of management, with respect to genetic investigation and management.
- Be exposed to and participate in physical examinations for identifying dysmorphic features in newborns, young children, and adults; and be able to properly document such features.

**Communicator**

As Communicators, physicians effectively facilitate the doctor patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter

- Be able to provide counseling to patients and families using lay language on the different disorders and concepts listed under medical expert 1 and 2 (in particular: aneuploidy, carrier screening, prenatal screening and diagnosis, multifactorial recurrence);
- Have an understanding of the concepts of nondirective counseling;
- Understand and be able to communicate the implications of prenatal screening such as maternal serum screen and ultrasoographic ‘soft markers’;
- Provide effective communication to other health care providers with regards to pregnancy planning, testing, teratogenicity, and prenatal screening.

### Collaborator

As Collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.

- Actively participate in a multidisciplinary team addressing complex genetics and psychosocial issues;
- Participate and present cases in joint meetings;
- Involve appropriate consultants in a timely manner for optimal patient care;
- Provide ongoing communication to referring caregivers regarding patient progress.

### Manager

As Managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.

- Work collaboratively in the institution;
- Use information technology effectively, including various computer databases, online programs, and other genetic and teratology resources that are available to the practitioner for patient care.

### Health Advocate

As Health Advocates, physicians responsibly use their expertise and influence to advance the health and wellbeing of individual patients, communities, and populations.

- Understand and be able to communicate strategies to prevent primary and recurrent birth defects (such as those caused by folic acid deficiency).

### Scholar

As Scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

- Maintain professional competencies through ongoing learning;
- Identify and utilize different sources of continuing education.

### Professional

As Professionals, physicians are committed to the health and wellbeing of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

- Demonstrate commitment to ethical and professional patient care;
- Have an understanding of basic ethical principles in medical genetics and the history of eugenics;
- Demonstrate responsibility, punctuality and respect for patients and others;
- Appropriately manage conflicts of interest;
- Practice patient confidentiality;
- Maintain appropriate relations with patients;
- Appreciate professional, legal, and ethical codes of practice.

### Evaluation

**Informal**

- The fellow will receive informal evaluation, with comments and suggestions after each observed counseling session or ward consultation.
- Formal:

- Towards the end of the rotation, each clinician and the head genetic counselor will be asked to formally comment on the fellow's progress during the rotation. The evaluation (ITER report) will include knowledge as well as counseling skills. The evaluations will be reviewed by the rotation coordinator, and presented to the fellow for discussion in a summarized written format before submission to the fellowship program director;
- At least one case-based discussion (CBD) or one mini-clinical evaluation exercise (mini-CEX) is required per genetics rotation;
- Genetic questions during formal written/OSCE exams.

**Rotation Format**

- Two blocks rotation in the Department of Medical Genetics.
- Fellow to be oriented to the Department. Objectives of the rotation to be reviewed.
- Attend and take increasing responsibility during counseling session. This is to include, but not limited to, those with prenatal concerns.

**Some useful references**

- Practical Genetic Counseling, by Peter Harper, 5th edition, 2001
- Thompson and Thompson's Genetics in Medicine, by Nussbaum, McInnes, Willard, 6th edition, 2001
- Genetic Disorders and the Fetus: Diagnosis, Prevention, and Treatment, by Milunski, A., 5th edition, 2004.

## Elective Rotation

The objective of this experience is to broaden the fellow's knowledge and/or strengthen skills pertinent to practice of maternal fetal medicine or correct identified deficiencies.

Fellows are encouraged and supported to pursue elective opportunities at other academic centers to broaden their exposure. This may occur at another tertiary level perinatal center or approved facility in the kingdom or overseas. Some elective rotations or off-site rotations might require the Program Committee approval. Additional research activity may be pursued during this time frame.

Elective rotations may include

- Maternal Fetal Medicine;
- Obstetric ultrasonography;
- Internal Medicine/Endocrinology/Nephrology;
- Adult Cardiology;
- Transfusion Medicine/Hematopathology;
- Anesthesia;
- Fetal/Pediatric Echocardiography;
- Fetal magnetic resonance imaging;
- Pediatric surgery;Pelvic surgery;
- Any other rotation pertaining to the specialty and approved by the fellowship committee.

Selection and organization of electives is undertaken by the fellow in consultation with the fellowship Program Director and with the approval of the fellowship Committee. All electives must have a pre-designated supervisor and written educational objectives and an evaluation must be completed at the end of the rotation.

### Rotation Format

- Four blocks of elective experience is included during the training period (1 block in the second year and 3 blocks in the third year).

### Evaluation

**Formal**

- Evaluation (ITER report) by the preceptors for the rotation collected and reviewed by the rotation coordinator with the fellow at the end of the rotation

## Appendix 2: Assessment Forms

### Form 1: On call Rating Form

**Trainee name:**_____

**Level:** _____

While on call, the fellow performed these tasks appropriately for his/her level of training:

| TASKS | CanMEDS Role | Ready for independent call status | Not readyfor independent call status | Insufficient Exposure | Initials and date |
|---|---|---|---|---|---|
| Assessment of patients and establishment of care plans | Medical Expert | | | | |
| Management of referred cases and phone advices | Manager, Collaborator | | | | |
| Performance of surgeries and instrumental deliveries | Medical Expert | | | | |
| Communication (verbal and written) with staff, referring physicians, and other professionals (nurses, clerical staff, social worker, etc.) | Collaborator | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Communications and interactions with patients and families | Communicator | | | | |
| Supervision and teaching of medical students and residents | Scholar | | | | |
| Self–assessment ability (aware of own limitations, seeks advice and assistance when appropriate) | Professional | | | | |
| Issues that require mention because they represent outstanding performance or need attention;<br><br>Evaluator Name:_____<br><br>Evaluator Signature:_____ | | | | | |

### Form 2: Presentation Rating Form

Trainee name: _____

Date of Presentation: _____

Topic: _____

Level: _____

Please use the following scale to evaluate the presentation:

| Very weak | Weak | Acceptable | Good | Very good | Not Applicable |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | N/A |

| Medical Expert | 1 | 2 | 3 | 4 | 5 | N/A |
|---|---|---|---|---|---|---|
| Demonstrated thorough knowledge of the topic | | | | | | |
| Presented at the appropriate level and with adequate details | | | | | | |
| Well-prepared, knows content, and answers questions | | | | | | |
| Comments (optional) | | | | | | |
| Communicator | 1 | 2 | 3 | 4 | 5 | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| Provided objectives and an outline | | | | | | |
| Presentation was clear and organized | | | | | | |
| Used effective methods and presentation style | | | | | | |
| Established good rapport with the audience | | | | | | |
| Comments (optional) | | | | | | |
| Collaborator | 1 | 2 | 3 | 4 | 5 | N/A |
| Invited comments from learners and led discussions | | | | | | |
| Worked with supervisor/team effectively in preparing the session | | | | | | |
| Comments (optional) | | | | | | |
| Health advocate | 1 | 2 | 3 | 4 | 5 | N/A |
| Managed time effectively | | | | | | |
| Addressed preventive aspects of care | | | | | | |
| Comments (optional) | | | | | | |
| Scholar | 1 | 2 | 3 | 4 | 5 | N/A |
| Posed appropriate learning questions | | | | | | |
| Accessed and interpreted the relevant literature | | | | | | |
| Comments (optional) | | | | | | |
| Professional | 1 | 2 | 3 | 4 | 5 | N/A |
| Maintained patients' confidentiality if clinical material was used | | | | | | |
| Identified and managed relevant conflicts of interest | | | | | | |
| Supported conclusions with relevant convincing evidence | | | | | | |
| Comments (optional) | | | | | | |

| Overall Performance | | | | |
|---|---|---|---|---|
| Did Not Meet Expectations | Short of Expectations | Met Expectations | Exceeded | Far Exceeded Expectations |
| | | | | |
| Comments: | | | | |

Evaluator Name: _____

Evaluator Signature:_____

## Form 3: Case-Based Discussion (CBD)

### Definition

**Case-Based Discussion (CBD)**

The purpose of a Case-Based Discussion (CBD) encounter is to evaluate the level of professional judgment exercised by the trainee in clinical case presentations. CBD is designed to:

- Guide the trainee's learning through structured feedbacks;
- Help improve clinical decision making, clinical knowledge, and patient management;
- Provide the trainee with an opportunity to discuss their approach to the case and identify strategies to improve their practice;
- Be a teaching opportunity enabling the evaluator to share their professional knowledge and experience.

### Overview

CBD encounter involves a comprehensive review of clinical cases between a trainee and an evaluator. The trainee receives feedback from an evaluator across a range of areas relating to clinical knowledge, clinical decision-making, and patient management. CBD encounter takes approximately 20-30 minutes.

### Trainee responsibilities

- Arrange a CBD encounter with an evaluator.
- Provide the evaluator with a copy of the CBD rating form.

### Evaluator responsibilities

- Select the case(s) for discussion;
- Use the CBD form to rate the trainee;
- Provide constructive feedback and discuss improvement strategies;
- Provide an overall judgment on the trainee's clinical decision-making skills.

| CASE-BASED DISCUSSION RATING FORM | | | | |
|---|---|---|---|---|
| Trainee name: | | | | |
| SCFHS Registration no: | | | | |
| Residency level: Date: | | | | |
| Brief summary of case: | | | | |
| □ New Case | □ Follow-up Case | | | |
| Assessment setting: | | | | |
| □ Inpatient | □ Ambulatory | □ ICU | □ CCU | □ Emergency department |
| Complexity: | | | | |
| □ Low | □ Moderate | □ High | | |
| Focus: | | | | |
| □ Data gathering | □ Diagnosis | □ Therapy | □ Counseling | □ Other |

| Assessment: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SCORE FOR STAGE OF TRAINING | | | | | | | | | |
| Questions | Unsatisfactory | | | Satisfactory | | | Superior | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Medical Record Documentation | | | | | | | | | |
| Clinical Assessment | | | | | | | | | |
| Investigation and referrals | | | | | | | | | |
| Treatment | | | | | | | | | |
| Follow-up and future planning | | | | | | | | | |
| Professionalism | | | | | | | | | |
| Clinical judgment | | | | | | | | | |
| Leadership/managerial skills | | | | | | | | | |
| Overall performance | | | | | | | | | |

Suggestions for Development:

Evaluator Name:_____

Evaluator Signature:_____

## Form 4: Direct Observation of Procedural Skills (DOPS)

The direct observation of procedural skills commonly referred to as DOPS is one of the workplace based assessment (WBA) tools. DOPS is a structured checklist for assessing competence in performing diagnostic and interventional procedures. It facilitates feedback in order to develop behaviors and performance related to operative, decision-making, communication, and teamwork skills. The assessment is formative and is aimed at guiding further development of practice.

| | | | |
|---|---|---|---|
| **Trainee's Name** | | **SCFHS Registration #** | |
| **Procedure Observed** | | | |
| **Observed by** | | **Date** | |
| **Signature of Observer** | | | |

| **Description** | Satisfactory | Unsatisfactory | Comment |
|---|---|---|---|
| Understood the indications for the procedure and clinical alternatives | | | |
| Explained plans and potential risks to the patient clearly and in an understandable manner | | | |
| Good understanding of the theoretical background, including anatomy, physiology, and imaging, of the | | | |
| Good advanced preparation for the procedure | | | |
| Communicated the procedural plan to relevant staff | | | |
| Explained procedure to the patient and obtained valid informed consent | | | |
| Aware of risks of cross infection and demonstrated an effective aseptic technique during the procedure | | | |
| Procedure success or failure was understood in the current setting | | | |
| Coped well with unexpected problems | | | |
| Demonstrated awareness through constant monitoring, maintained focus | | | |
| Demonstrated confidence, correct procedural sequence, minimal hesitation | | | |
| Skillful, handled patient and tissues gently | | | |
| Maintained accurate and legible records including descriptions of problems or difficulties | | | |
| Issued clear post procedural instructions to the patient and/or staff | | | |
| Sought to work to the highest professional standards at all times | | | |

| ASSESSMENT |
| --- |
| **Practice was satisfactory (Yes/No):** |
| **Practice was unsatisfactory (Yes/No):** |
| **Examples of good practice:**<br><br>**Areas of practice requiring improvement:**<br><br>**Further learning and experience should focus on the following:** |

### Form 5: Mini-Clinical Evaluation Exercise (Mini-CEX)

#### Definition

The mini-CEX is a 10-20 minute direct observation assessment or "snapshot" of a trainee-patient interaction. To be most useful, the evaluator should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.

#### Purpose

A mini-CEX is designed to:

- Guide the trainee's learning through structured feedback;
- Help improve communication, history taking, physical examination, and professional practice;
- Provide the trainee with an opportunity to be observed during interactions with patients and identify strategies to improve their practice;
- Be a teaching opportunity enabling the evaluator to share professional knowledge and experience.

#### Overview

A mini-CEX encounter involves a trainee being observed in the workplace, while consulting with a patient. The trainee is given feedback across a range of areas relating to professional qualities and clinical competence from an evaluator immediately after the observation.

#### Trainee responsibilities

- Arrange a mini-CEX encounter with an evaluator;
- Provide the evaluator with a copy of the mini-CEX rating form.

#### Evaluator responsibilities

- Choose appropriate consultation for the encounter;
- Use the mini-CEX rating form to rate the trainee;
- Provide constructive feedback and discuss improvement strategies. If a trainee receives an unsatisfactory rating, the assessor must complete the 'Suggestions for Development' section. The form cannot be submitted if this section is left blank.

| | |
|---|---|
| **Trainee name:** | |
| **SCFHS Registration no.:** | |
| **Residency level:** | **Date:** |
| **Mini-CEX time:** | **min** |
| **Observing time:** | **min** |
| **Providing feedback:** | **min** |
| **Brief summary of case:** | |

☐ New Case □ Follow-up Case

Assessment setting:

☐ Inpatient ☐ Ambulatory ☐ ICU ☐ CCU
☐ Emergency department ☐ Other_____

Complexity:

☐ Low ☐ Moderate ☐ High

Focus:

☐ Data gathering ☐ Diagnosis ☐ Therapy
☐ Counseling ☐Other_____

Assessment:

SCORE FOR STAGE OF TRAINING

| Questions | Unsatisfactory | | | Satisfactory | | | Superior | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| History taking | | | | | | | | | |
| Physical examination skills | | | | | | | | | |
| Communication skills | | | | | | | | | |
| Critical judgment | | | | | | | | | |
| Humanistic quality/professionalism | | | | | | | | | |
| Organization and efficiency | | | | | | | | | |
| Overall clinical care | | | | | | | | | |

Suggestions for Development:

Evaluator Name:_____

Evaluator Signature:_____

| Question | Description |
|---|---|
| History taking | Facilitates patient's narrative; uses appropriate questions to obtain accurate, adequate information effectively; responds to verbal and nonverbal cues appropriately |
| Physical examination skills | Follows an efficient, logical sequence; examinations are appropriate for clinical problems; provides patients with explanations; is sensitive to patients' comfort and modesty |
| Communication skills | Explores patients' perspectives; jargon free speech; open and honest; empathetic; agrees management plans and therapies with patients |
| Critical judgment | Forms appropriate diagnoses and suitable management plans; orders selectively and performs appropriate diagnostic studies; considers risks and benefits |
| Humanistic quality/professionalism | Shows respect, compassion, and empathy; establishes trust; attends to patient's comfort needs; respects confidentiality; behaves in an ethical manner; is aware of legal frameworks and his or her own limitations |
| Organization and efficiency | Prioritizes; is timely and succinct; summarizes |
| Overall clinical care | Demonstrates global judgment based on the above topics |

## Form 6: In-Training Evaluation Report (ITER)

### Definition

The CanMEDS-based competencies end of rotation evaluation form is a summative evaluation report prepared for each fellow at the end of each year based on the end of rotation reports, which might also involve clinical, oral exams, and completing other academic or clinical assignment(s). These academic or clinical assignments should be documented by an electronic tracking system (for example T-Res) on an annual basis. Evaluations will be based on the accomplishment of the minimum requirements of the procedures and clinical skills, as determined by the program.

### ITER Examination Bylaw

**Introduction**

Annual ITER is a component of promotion to the next year of a specialist-training program. Eligibility of promotion includes a satisfactory overall annual ITER.

**ITER Format**

- One ITER is submitted for each rotation to the program based on a series of workplace-based assessments considered relevant by the rotation. Such an assessment might be a multi-source feedback, mini-CEX, DOPS, or a combination.
- An annual ITER is the average of the ITERs during the specific training year, which might also involve OSCE, SOE, research activity, international examinations and/or academic assignments. The proportion for any one of these shall not exceed 50% of the annual ITER score.
- If any other assessment format is used, the CAC (Central Assessment Committee) must agree to its implementation.

| IN-TRAINING EVALUATION REPORT | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Trainee Name:** | | | | | | | |
| **SCFHS#** | | | | | | | |
| **Training Center:** | | | | | | | |
| **Level of training:** | | | | | | | |
| **Rotation Dates:** | | | | | | | |
| | Meeting Expectations * | | | | | | |
| Competencies | Rarely | Inconsistently | Generally | Exceeds | N/A | | |
| Medical Expert | | | | | | Score | Weight % |
| Appropriate basic knowledge | | | | | | Subtotal:/100 | 50 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Accurate history and physical exam | | | | | | | |
| Appropriate clinical decisions | | | | | | | |
| Appropriate emergency management | | | | | | | |
| Appropriate indication for procedures | | | | | | | |
| Performance before, during, and after 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 management of conflicts | | | | | | | |
| Manager | | | | | | | |
| Proper use of information technology | | | | | | Subtotal:/100 | 10 |
| Proper understanding of resources | | | | | | | |
| Appropriate time management | | | | | | | |
| Follow policies and procedures | | | | | | | |
| Maximize benefits to patients | | | | | | | |
| Health Advocate | | | | | | | |
| Appropriate response to patient health needs | | | | | | Subtotal:/100 | 5 |
| Appropriate promotion 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 | | | | | | | |
| Completion of the electronic log-book | | | | | | | |
| Professional | | | | | | | |
| Proper professional attitude | | | | | | Subtotal:/100 | 5 |
| Understands medical and legal obligations | | | | | | | |
| Punctual | | | | | | | |
| Maintain ethics and morals | | | | | | | |
| Accepts advices | | | | | | | |
| Participates in professional organizations | | | | | | | |
| | | | | | | Total Score:/100 | 100 |

| | | | | | |
|---|---|---|---|---|---|
| Comment on the strengths and weaknesses of the candidate. Make direct reference to the objectives and give specific examples wherever possible. | | | | | |
| Evaluation methods | 4 Mini-CEX | 5 DOPS | 6 OSCE | 7 MCQ | Others (specify): |
| Residency training | | Meeting No. | | | Date |
| Program Director Name: Date Signature | | | | | |
| Trainee Name: Date Signature | | | | | |

* Rarely ≤ 30%, Inconsistently > 30–60%, Generally > 60–90%, Exceeds > 90%

4 Mini-CEX= Mini clinical evaluation exercise

5 DOPS= Direct observation of procedural skill

6 OSCE= Objective structured clinical examination

7 MCQ= Multiple choice questions

## Form 7: Final In-Training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)

### Definition

The FITER is completed by the resident training Program Director. FITER is prepared by program directors for each fellow at the end of his/her final year in fellowship, which might also involve clinical, oral exams, and completing other academic assignment(s).

This is a summative evaluation prepared at the end of the fellowship program, which grants the fellow with a full range of competencies (knowledge, skills and attitudes) required for a specialist, and readiness to undergo the Saudi certification examinations. The FITER is not a composite of the regular in-training evaluations; rather it is a testimony of the evaluation of competencies at the end of a fellowship education program.

### FITER Examination Bylaw

Obtaining a training completion certificate issued by the local supervisory committee based on a satisfactory FITER report and any other related requirements assigned by any mentioned scientific boards (e.g. research, publication, logbook, etc.) grants eligibility to sit the final MFM examination.

| FINAL IN-TRAINING EVALUATION REPORT (FITER) COMPREHENSIVE COMPETENCY REPORT | | |
|---|---|---|
| Trainee SCFHS number: | | |
| Evaluation covering the last year as a fellow: | | |
| In the view of the Fellowship Program Committee, the trainee mentioned above has acquired the competencies of the specialty/subspecialty as prescribed in the Objectives of Training and is competent to practice as a specialist. | | |
| Category | YES | NO |
| Written exams | | |
| Oral exams | | |
| Clinical observations (e.g., ITERs) from faculty | | |
| OSCEs | | |
| Feedback from healthcare professionals | | |
| Completion of a scholarly project | | |
| Other evaluations: | | |
| COMMENTS: | | |
| Name of Program Director/Assessor for CCR: | | |

| | |
|---|---|
| Signature: | |
| This is to attest that I have read this document. | |
| Name of Trainee: | |
| SCFHS number: | |
| Date: | Signature: |
| TRAINEE'S COMMENTS: | |
| Note: If, during the period from the date of signature of this document to the completion of training, the Fellowship Program Committee judges that the candidate's demonstration of competence is inconsistent with the present evaluation, it may declare the document null and void and replace it with an updated FITER. Eligibility for the examination would be dependent on the updated FITER. | |

| **FITER: (Medical Expert Competency)** | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **MEDICAL EXPERT** | | | | | | |
| Possesses basic scientific and clinical knowledge relevant to specialty | | | | | | |
| Performs histories and physical examinations that are complete, accurate, and well-organized | | | | | | |
| Uses all pertinent information to arrive at complete and accurate clinical decisions | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Recognizes and manages emergency conditions resulting in prompt and appropriate treatment. Remains calm, acts in a timely manner, and prioritizes correctly | | | | | | |
| Recognizes and appropriately manages patients with complex problems and multi-system disease | | | | | | |
| Demonstrates proficiency in pre-operative and post-operative patient management, including indications for surgical intervention | | | | | | |
| Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible. | | | | | | |

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| FITER: (Procedures and Clinical Skills Competencies) | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **PROCEDURES AND CLINICAL SKILLS** | | | | | | |
| a. Demonstrates the ability to perform diagnostic and therapeutic procedures/skills described in the Specialty Curriculum | | | | | | |
| 1. Cesarean section | | | | | | |
| Brief description of procedure: | | | | | | |
| 2. Cervical suture | | | | | | |
| Brief description of procedure: | | | | | | |
| 3. Amniocentesis/ CVS | | | | | | |
| Brief description of procedure: | | | | | | |
| 4. Other Procedures | | | | | | |
| Mention type of procedure: | | | | | | |
| 5. Clinical Skills | | | | | | |
| Mention type of skill: | | | | | | |
| b. Minimizes risks and discomforts to the patient | | | | | | |
| c. Overall is proficient in procedures and clinical skills | | | | | | |

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

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| **FITER: (Communicator Competency)** | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **COMMUNICATOR** | | | | | | |
| a. Establishes a therapeutic relationship with patients and communicates well with the family. Provides clear and thorough explanations of diagnosis, investigation, and management in a professional manner. Demonstrates empathy and sensitivity to racial, gender-based, and cultural issues | | | | | | |
| b. Prepares documents that are accurate and timely | | | | | | |
| c. Develops diagnostic and therapeutic plans that are understandable to patients and clear and concise for other healthcare personnel, including other consultants | | | | | | |
| d. Presents clinical summaries and scientific information in a clear and concise manner to a healthcare audience | | | | | | |

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

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| FITER: (Collaborator Competency) | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **COLLABORATOR** | | | | | | |
| a. Interacts effectively with health professionals by recognizing and acknowledging their roles and expertise | | | | | | |
| b. Consults and delegates effectively | | | | | | |
| c. Establishes good relationships with peers and other health professionals | | | | | | |
| d. Effectively provides and receives information from other health professionals | | | | | | |
| e. Manages conflict situations well | | | | | | |

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

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| FITER: (Manager Competency) | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **MANAGER** | | | | | | |
| a. Understands and makes effective use of information technology, such as methods for searching medical databases | | | | | | |
| b. Makes cost-effective use of healthcare resources based on sound judgment | | | | | | |
| c. Prioritizes and uses personal and professional time effectively in order to achieve a balanced personal and professional life | | | | | | |
| d. Demonstrates an understanding of the principles of practice management | | | | | | |
| e. Demonstrates the ability to effectively utilize healthcare resources to maximize benefits to all patients, including managing waiting lists | | | | | | |
| Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible. | | | | | | |

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| FITER: (Health Advocate Competency) | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **HEALTH ADVOCATE** | | | | | | |
| a. Understands the specialist's role to intervene on behalf of patients with respect to the social, economic, and biological factors that may impact their health | | | | | | |
| b. Understands the specialist's role to intervene on behalf of the community with respect to the social, economic, and biological factors that may impact on community health | | | | | | |
| c. Recognizes and responds appropriately in advocacy situations | | | | | | |
| Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible. | | | | | | |

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| FITER: (Scholar Competency) | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | * Inconsistently meets | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **SCHOLAR** | | | | | | |
| a. Demonstrates an understanding of, and a commitment to, the need for continuous learning. Develops and implements an ongoing and effective personal learning strategy | | | | | | |
| b. Critically appraises medical information by asking relevant questions and determining which information is reliable. Successfully integrates information from a variety of sources. | | | | | | |
| c. Understands the principles of adult learning and helps others learn by providing guidance, teaching, and giving constructive feedback | | | | | | |
| d. Facilitates the learning of patients, other house staff/students, and other health professionals | | | | | | |
| e. Completes the electronic log book in a timely fashion | | | | | | |
| 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. | | | | | | |

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

| FITER: (Professional Competency) | | | | | | |
|---|---|---|---|---|---|---|
| Trainee Name: | | | | | | |
| Trainee SCFHS number: | | | | | | |
| | EXPECTATIONS | | | | | |
| | * Rarely meets | *Inconsistently | *Generally meets | *Sometimes exceeds | * Consistently exceeds | Not Applicable |
| **PROFESSIONAL*** | | | | | | |
| | | | | | | |
| a. Demonstrates integrity, honesty, compassion, and respect for diversity | | | | | | |
| b. Fulfills medical, legal, and professional obligations of the specialist | | | | | | |
| c. Meets deadlines and demonstrates punctuality | | | | | | |
| d. Monitors patients and provides follow-up | | | | | | |
| Understands the principles of ethics and applies these in clinical situations<br>Demonstrates an awareness of limitations, and seeks advice when necessary. | | | | | | |
| Accepts advice graciously | | | | | | |
| h. Demonstrates respect towards other physicians and healthcare | | | | | | |
| i. Participates in professional organizations—local, provincial, and | | | | | | |
| Please comment on the strengths and weaknesses of the candidate and provide a rationale for your ratings. Make direct reference to the objectives and give specific examples wherever possible. | | | | | | |

*Rarely meets ≤30%; Inconsistently meets >30–60%; Generally meets >60–80%; Sometimes exceeds >80–90%; Consistently exceeds >90%

## Appendix 3: Log Book

### MFM Fellowship Logbook

**Fellow: Year -Preface**

Maternal Fetal Medicine Fellowship has a variety of conditions and aspects of training and practices. It has an office, ultrasonography, procedural, surgical and in-patient encounters.

This logbook is intended to help you track and keep records of cases and conditions you have been involved in (diagnosis/ management).

This logbook is divided into 4 parts; Clinical cases, ultrasonography/procedures, surgical, and academic. Fellows should print the activity name, level of participation (P1: Observe/Assist or P2: Perform under supervision), and the new knowledge or skill that has been gained in this participation. At the end of the activity, the supervisor should review and sign for this encounter.

Each part has a list of cases or conditions in which the trainee should comply with the minimum number of each. Some of them are more common than the others. Conditions not listed should also be included if the fellow has been involved in its diagnosis/management. One logbook is required per year of training.

**Clinical Cases Log***

| Case | Date | MRN | Level of participation (P1/P2)** | Knowledge obtained | Supervisor's signature |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

* More pages can be added as needed

** P1: Observe/Assist P2: Perform under supervision

**List of clinical cases:**

1) Hypertensive disorders (minimum 10 cases)
   - Preeclampsia
   - HELLP syndrome
   - Accelerated hypertension (chronic or acute) with increasing requirements for medications
   - Preeclampsia with severe features
2) IUGR (minimum 10 cases)
3) Antepartum hemorrhage (minimum 4 cases)
   - Placental abruption
   - Placenta previa
4) Pre-gestational diabetes mellitus (minimum 10 cases):
   - Pre-pregnant DM (Type I or Type II) with maternal complications
   - Fetal involvement (growth disturbance, anomalies, oligohydramnios)
5) Maternal Cardiac disease at any gestational age (minimum 1 case)
   - American Heart Association classification II or III
   - History of valve replacement or surgical repair
   - Concerns about effects at delivery
   - Maternal arrhythmia requiring treatment
6) Gastrointestinal disorders (minimum 1 case)
   - Ulcerative colitis or Crohn's disease unresponsive to treatment requiring TPN and long term dietary counseling
7) Maternal malignancy at any gestational age (minimum 1 case)
   - Disease coincident with pregnancy resulting in unstable maternal condition, requiring chemotherapy, radiation therapy or surgery during pregnancy or possibly requiring preterm delivery to facilitate treatment.
8) Maternal renal disease (minimum 2 cases)
   - With deterioration of renal function
   - With associated hypertension
   - Transplants
   - Previous transplant of any major organ at any gestational age
9) Maternal neurological conditions at any gestational age (minimum 1 case):
   - AV malformations
   - Aneurysms
   - Previous cerebrovascular accident
   - Seizure disorders not under control
   - Paraplegia or quadriplegia
   - Maternal spina bifida
   - Muscular dystrophy or other neuromuscular disorders
   - Multiple sclerosis at any gestational age
   - Spina bifida
   - Paraplegia/quadriplegia
   - Other MSS conditions with wheelchair requirements
10) Connective tissue disorders at any gestational age (minimum 3 cases)
   - SLE/Rheumatoid arthritis/mixed connective tissue disorders

11) Antiphospholipid Antibody syndrome ≤ 34 weeks with: (minimum 2 cases)
    - Previous late perinatal loss
    - Previous IUGR / abruption
    - Previous arterial or venous thrombosis
12) Perinatal infections or risk of congenital infections such as (minimum 1 case)
    - Perinatal infection with syphilis, tuberculosis, parvovirus, listeria, cytomegalovirus at any gestational age.
    - Third trimester exposure to varicella, HIV
    - First trimester exposure to rubella, varicella, toxoplasmosis,
13) Significant respiratory disorders (minimum 1 case)
    - Cystic fibrosis
14) Hematological disorders at any gestational age such as (minimum 2 cases)
    - Thrombophilia other than APAS
    - Hemoglobinopathy
    - Clotting disorders (factor deficiencies, severe ITP).
15) Prior PPROM and Preterm labour and delivery ≤
    - 32 weeks (minimum 5 cases)
16) Prior second trimester gestational hypertension with proteinuria and adverse conditions requiring delivery ≤ 32 weeks (minimum 1-3 cases)
17) Prior poor perinatal outcome (minimum 3 cases)
    - Prior stillbirth
    - Prior neonatal demise

**Ultrasonography/Procedure Log***

| Condition | Date | MRN | Level of participation (P1/P2)** | Knowledge obtained | Supervisor's signature |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

* More pages can be added as needed
** P1: Observe/Assist P2: Perform under supervision

**List of diagnostic and therapeutic procedures**

1. Ultrasonographic Imaging including:
   - Dating and viability (minimum 15 cases)
   - First trimester screening scan (minimum 5 cases)
   - Nuchal Translucency (NT) (minimum 10 cases)
   - Fetal Biometry (minimum 50 cases)
   - Genetic sonogram (18 – 22 weeks) (minimum 25 cases)
   - Biophysical Profile (minimum 50 cases)
   - Fetal and Maternal Doppler Studies (minimum 20 cases)
   - Multiples including chorionicity (minimum 8 cases)
   - 3D/4D scan (minimum 5 cases)
   - Fetal Echocardiography (minimum 10 cases)
2. Selective Multi-fetal pregnancy reduction (minimum 1 case)
3. Amniocentesis/CVS (minimum 20 cases)
4. Amnioreduction (minimum 2 cases)
5. Amnioinfusion (minimum 1 case)
6. Fetal Blood Sampling (FBS)/Cordocentesis (minimum 1 case)
7. Intrauterine fetal blood transfusion (IUT) (minimum 1 case)
8. Fetal thoracocentesis/Thoracoamniotic shunt placement (minimum 1 case)
9. Fetal Vesicocentesis/Vesicoamniotic shunt placement (minimum 1 case)
10. Cephalocentesis (Transabdominal and Transcervical) (minimum 1 case)
11. Fetoscopy procedures (minimum 1 case)

**List of Fetal Anomalies**

1. Abdominal wall defect: omphalocele, gastroschisis, Pentalogy of Cantrell, bladder extrophy. (minimum 2 cases)
2. Amniotic bands (minimum 1 case)
3. Central nervous system malformation (minimum 5 cases)
4. Congenital heart defect (minimum 4 cases)
5. Cystic hygroma (minimum 2 cases)
6. Suspected fetal viral infections (CMV/Parvo B19/Toxoplasmosis) (minimum 1 case)
7. Congenital Diaphragmatic hernia (minimum 1 case)
8. Facial abnormalities: cleft lip and/or palate (minimum 2 cases)
9. Fluid collections in fetuses: ascites, pleural effusion, or pericardial effusions and hydrops. (minimum 4 cases)
10. Gastrointestinal anomalies: (minimum 2 cases)
    - Obstruction such as duodenal atresia
    - Other GI obstructions presenting with dilated bowel loops
11. Intrauterine growth restriction (IUGR) <26 weeks (minimum 3 cases)
12. Limb anomalies (minimum 1 case)
13. Lung pathology such as CCAM/CPAM or pulmonary sequestration. (minimum 1 case)
14. Microcephaly (HC < 3%). (minimum 1 case)
15. Fetal body masses: Neck, face, back, such as sacrococcygeal teratomas (minimum 1 case)
16. Neural tube defect. (minimum 2 cases)

17. Obstructive uropathy. (minimum 2 cases)
    - Hydronephrosis >10mm
    - Bilateral hydroureters
    - Megacystis
18. Oligohydramnios detected before 26 weeks gestation (minimum 1 case)
19. Polyhydramnios (minimum 5 cases)
20. Renal anomalies: (minimum 5 cases)
    - Dysplastic
    - Multicystic
    - Agenesis
21. Skeletal dysplasia (minimum 1 case)

**Surgical Cases Log***

| Title ofsurgery | Date | MRN | Level of participation (P1/P2)** | Knowledge obtained | Supervisor's signature |
|---|---|---|---|---|---|
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*More pages can be added as needed

** P1: Observe/Assist P2: Perform under supervision

**List of surgical cases**

1. Elective cesarean section (minimum 20 cases)
2. Emergency cesarean section (minimum 20 cases)
3. Second stage of labor cesarean section (minimum 10 cases)
4. Cesarean section for multiple pregnancies (minimum 10 cases)
5. Cesarean section for malpresentation (minimum 5 cases)
6. Preterm cesarean section 32 weeks (minimum 2 cases)
7. Cesarean section for low placenta/placenta previa (minimum 2 cases)
8. Cervical suture: elective (minimum 10 cases)
9. Cervical suture: urgent/ emergent (minimum 1-2 cases)
10. Instrumental vaginal delivery (minimum 5 cases)

**Academic Activities Log***

| Topic of presentation | Date | Type of presentation | Knowledge obtained | Supervisor's signature |
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*More pages can be added as needed

**List of academic activities**

1. Grand Round (minimum 1 presentation)
2. Case presentation (minimum 2-4 presentations)
3. Mortality & morbidity meeting (minimum 0-2 presentations / reviews)
4. Journal club (minimum 2-4 presentations)
5. Teaching lecture (minimum 0-2 presentations)
6. Local conference/Meeting (minimum 0-1 presentation)
7. International Conference/Meeting (minimum 0-1 presentation)