OBJECTIVES OF TRAINING AND SPECIALTY REQUIREMENTS IN MATERNAL FETAL MEDICINE (INCLUDING ULTRASOUND)

At the completion of training, the MFM resident will have acquired the following competencies and will function effectively as:

1. **MEDICAL EXPERT / CLINICAL DECISION-MAKER**

*Definition*

Obstetricians and gynecologists possess a defined body of knowledge and procedural skills, which are used to collect and interpret data, make appropriate clinical decisions, and carry out diagnostic and therapeutic procedures within the boundaries of their discipline and expertise. Their care is characterized by up-to-date, ethical, and cost-effective clinical practice and effective communication in partnership with patients, other healthcare providers, and the community. The role of *medical expert/clinical decision-maker* is central to the function of obstetricians and gynecologists, and draws on the competencies included in the roles of scholar, communicator, health advocate, manager, collaborator, and professional.

Two levels of knowledge and proficiency are referred to in this document.

An **extensive level** refers to an in-depth understanding of an area, from basic science to clinical application, and possession of skills to manage independently a problem in the area.

A **working level** indicates a level of knowledge sufficient for the clinical management of a condition, and/or an understanding of an approach or technique sufficient to counsel and recommend it, without having personally achieved mastery of that approach or technique.

### 1.1 General Objectives

The fully trained obstetrician and gynecologist must demonstrate:

- diagnostic and therapeutic skills for effective and ethical patient care
- the ability to access and apply relevant information to clinical practice
- effective consultation services with respect to patient care, education, media relations and legal opinions
- recognition of personal limitations of expertise, including the need for appropriate patient referral and continuing medical education

### 1.2 Specific Objectives for the specialty Maternal-Fetal Medicine (MFM)

The general obstetrician requires considerable knowledge in MFM as they are often the point of first contact with the high-risk obstetrical patient. In order to achieve these objectives, the resident must demonstrate both knowledge (cognitive skill) and technical ability in the approach to problems in the practice of
MFM. The following represents the minimum level of competency in MFM, and quite likely, the resident will achieve higher levels of competencies than outlined here. The rotation in MFM will not cover all of these objectives, but will serve as the foundation for much of them. It is expected that the resident rotations in Obstetrics will contribute to the core knowledge pertaining to MFM. Objectives that pertain to general obstetrics will be listed elsewhere.

1.2.1 Cognitive Skills
The MFM resident will possess knowledge of the following clinical conditions or problems encountered commonly in the practice of obstetrics and MFM. This list should be considered a minimum baseline, and not be considered as comprehensive for all disorders in the practice of this specialty.

The cognitive skills in MFM are broadly grouped under the following headings:
- a) Antenatal care
- b) Genetics/Prenatal diagnosis
- c) The Fetus and Fetal medicine
- d) Obstetrics and its complications
- e) Pre-existing Maternal Diseases and conditions
- f) Termination of Pregnancy.

1.2.1.1 An extensive level of knowledge is required for the following:

a. Antenatal Care
   1. Pregnancy induced maternal physiological changes
   2. Routine antepartum assessment of normal pregnancy.
   3. The effects of underlying medical, surgical, social, and psychosocial conditions on maternal and fetal health, and appropriate management of such
   4. Knowledge and use of antepartum fetal surveillance in the normal and high-risk pregnancy
      a) Fetal movement counting
      b) NST
      c) Biophysical profile score
      d) Doppler ultrasound (Umbilical vessels, middle cerebral, ductus venous, uterine artery)

b. Genetics/Prenatal Diagnosis
   1) The resident must be able to identify from history whether a patient is at risk of passing on a genetic disorder.
   2) Genetic counseling: conduct a proper genetic screening/history, testing and counseling, including the complications from invasive procedures like chorionic villus sampling and amniocentesis, and the
outcomes of pregnancies complicated by fetal anomalies or aneuploidy

3) Basics of Mendelian inheritance
4) Components and limitations of a second trimester screening anatomical ultrasound.
5) Nuchal Translucency Screening
6) Maternal serum screening
7) Counseling regarding positive screening for Down Syndrome.

c. **Fetal Fetus and Fetal Medicine**
   - Fetal embryology, and development
   - Fetal physiology
   - Prematurity - its risks and complications.
   - Mechanisms of multiple gestation and potential associated complications
   - The fetus with anomalies: general approach and considerations.
   - Abnormalities of fetal growth or amniotic fluid
     a. IUGR - symmetric and asymmetric
     b. Macrosomia
     c. Poly / Oligohydramnios

d. **Obstetrics and it’s Complications**
   The pathophysiology, prevention, investigation, diagnosis and/or management of:
1) Abnormalities/disorders of placenta:
   - Placenta Previa and Vasa Previa
   - Placenta accrete, increta, percreta
   - Abruptio placenta
2) Premature birth
   - Preterm labour, including tocolytic therapy
   - Antenatal corticosteroids
   - Preterm premature rupture of membranes
   - Incompetent cervix
   - Uterine anomalies
3) Gestational hypertension and related areas
   - HELLP, Acute fatty liver
   - Severe pre-eclampsia gestational hyper-tension
   - Eclampsia
   - TTP
4) Prior adverse pregnancy outcomes
   - Previous stillbirth
   - Previous preterm birth
   - Previous gestational hypertension
   - Prior fetal anomalies
5) **Multiple gestations**
   - Consequences, co-morbidity and mortality of monochorionic/-monoamniotic twinning.
   - Discordant growth, or anomalies

6) **Maternal pregnancy related conditions**
   - Cholestasis of pregnancy
   - PUPPS
   - Herpes Gestationalis

7) **Maternal trauma**

8) **Obstetrical Infections**
   The pathophysiology, investigation, diagnosis, and/or management of:
   - Chorioamnionitis

e. **Termination of Pregnancy second and third trimester**
   - Counseling patients with regards to termination methods
   - Developing an awareness of the psychosocial aspects of termination and its impact on the patient, especially in the context of a wanted pregnancy being terminated for genetic or maternal medical complications.

1.2.1.2 **A working level of knowledge is required for the following:**

a. **Genetics/Prenatal Diagnosis**
   - Common chromosomal abnormalities: Trisomy 21, 13, 18, 45 XO,
   - Inherited disorders (common): such as thalassemia, Tay Sachs, sickle cell anemia, cystic fibrosis,
   - Indications for and methods of prenatal screening and diagnosis: including CVS, cordocentesis, amniocentesis, maternal serum screening, ultrasound, fetal echocardiography.
   - Teratology
      a. Common teratogens: Alcohol, Anti epilepters, Isotretoin warfarin, Androgenic hormones, Thalidomide, Diethylstilbestrol
      b. Perinatal Infections: TORCH, Parovirus, and Syphilis
      c. Radiation
      d. Hyperthermia

b. **The Fetus and Fetal Medicine**
   The fetus with severe anomalies and/or abnormal physiology such as;
   - Fetal hydrops and arrhythmias
Major anomalies such as:
1. neural tube defects
2. congenital heart disease
3. abdominal wall defects
4. congenital diaphragmatic hernia
5. urinary tract anomalies

Minor anomalies such as clubfeet, cleft lip and palate, and soft markers of aneuploidy

c. Obstetrics and its' Complications

1. Obstetric anesthesia, including the risks and benefits of general anesthesia, spinal anesthesia, epidural anesthesia, pudendal nerve block and narcotics.
2. Multiple pregnancies
   - Twin to twin transfusion syndrome
   - Triplets and other higher order multiples
3. Fetal Isoimmunization
   - Red blood cell
   - Platelet

d. Co-existing Maternal Diseases and Conditions

1. Endocrine
   - Diabetes
   - Hyper-Hypothyroidism
2. Cardiovascular
   - Valvular heart disease: (mitral, aortic, tricuspid, pulmonary, value replacement)
   - Pulmonary hypertension
   - Atherosclerotic heart disease
   - Essential hypertension
   - Cardiomyopathies
   - Marfans syndrome
3. Renal Diseases
   - Acute and Chronic renal disease
   - Urinary tract infection
   - Nephrolithiasis
   - Renal transplant
4. Gastrointestinal
   - Viral hepatitis
   - Panreatitis
   - Inflammatory bowel disease
   - Cholecystitis/Cholelithasis
5. Respiratory
   - Asthma
   - Pneumonia
6. Muskelo-skeletal/Connective tissue
   - Systemic lupus erythematosis
   - Rheumatoid arthritis
   - Antiphospholipid Antibody Syndrome
7. Infectious disease
   - Viral hepatitis
   - HIV
   - Herpes
   - Syphilis
   - CMV
   - Toxo
   - Parvo

8. Chemical dependence and addiction
   - Tobacco
   - Cocaine
   - Narcotics
   - Alcohol

9. Central Nervous system disorders
   - Cerebral vascular accident
   - Spinal cord injury
   - Epilepsy
   - Myasthenia Gravis
   - AV malformation

10. Malignancy in Pregnancy
    - Breast cancer
    - Hodgkin’s disease and other hematological cancers
    - Melanoma
    - Gynecological cancers – ovarian, cervical, etc.

11. Hematological disorders
    - Venous thrombolism
    - Von Willibrands Disease
    - ITP
    - Iron deficiency anemia

e. **Neonatal Care**

   - The principles of acute neonatal resuscitation
   - The neonatal complications associated with prematurity, macrosomia, birth asphyxia, assisted vaginal delivery, congenital anomalies and maternal medical complications, including their appropriate management and expected outcome.

1.2.2 TECHNICAL SKILLS

The fully trained obstetrician and gynecologist must possess a wide variety of technical skills in the practice of obstetrics and MFM. The following is a detailed list of required technical skills, including surgical skills. This list should be considered in its totality, and not be considered as exhaustive for all procedures required in specialty practice.
1.2.2.1 Diagnostic Procedures and Techniques
The MFM resident will demonstrate an understanding of the indications, risks and benefits, limitations and role of the following investigative techniques specific to the practice of MFM and will be competent in their interpretation.

a. Imaging
   - Obstetric ultrasound: screening and targeted (in each trimester) and biophysical profile and Doppler flow studies. In addition, the resident will be able to perform or determine: fetal lie and presentation, amniotic fluid volume, visualization of heart rate, placental site and basic biometry.

1.2.2.2 Surgical Skills
The list of surgical skills is divided into categories reflecting the frequency with which these procedures are encountered during residency training in obstetrics and gynecology as well as in the general practice of the specialty. The categorized list also reflects the level of technical skill competence for each surgical procedure expected after completion of a residency-training program in obstetrics and gynecology. The resident must be able to discuss with the patient the risks, benefits and complications of these surgical treatments (A, B) as well as any available non-surgical treatment alternatives and the consequences of the absence of surgical treatment.

a. Surgical Procedures List A

   The fully trained resident must be competent to independently perform the following procedures in List A. He/she should be able to manage a patient prior to, during and after all of the following procedures. (Not applicable in this rotation)

b. Surgical Procedures List B

   The following procedures in List B are those that the fully trained resident in MFM will understand and be able to perform, though he/she may not have actually acquired sufficient skill in residency to independently perform them.

   Obstetric Procedures
   - First trimester therapeutic abortion (CARE)
   - Dilation and evacuation in the second trimester (CARE)
   - Medical induction for termination of pregnancy
The following procedures in List C are those that the fully trained resident in MFM will understand but not be expected to be able to perform. He/she should be able to describe the principles of these procedures, the indications for referral and the perioperative management and complications.

Obstetric Procedures
- Second Trimester genetic amniocentesis
- Amniocentesis for the assessment of fetal lung maturity
- Chorionic villus sampling
- Cordocentesis and intrauterine transfusion
- Amnioinduction/diagnostic amnioinfusion
- Fetal shunting (bladder, chest, abdomen etc)
- Laser division of placental anastomosis
- Selective feticide

2. COMMUNICATOR

2.1 General Objectives
The fully trained obstetrician and gynecologist must be able to:
- Establish therapeutic relationships with patients and their families characterized by understanding, trust, empathy and confidentiality
- Obtain and synthesize relevant history from patients, families, and/or community
- Discuss appropriate information with the patient, her family, and other health care providers that facilitates optimal health care. This also implies the ability to maintain clear, accurate, timely and appropriate records.

2.2 Specific Objectives
To achieve these objectives as a communicator, the MFM resident must demonstrate:

2.2.1 The ability to obtain informed consent for medical and surgical therapies, including discussing the risks, benefits and complications of surgical versus non-surgical treatments as well as the consequences of non-treatment.

2.2.2 The ability to record accurately and succinctly data collected from patients, laboratory tests and radiological studies and to communicate (oral or written) conclusions based on these data to patients and their families, referring physicians and other involved health care personnel.

2.2.3 Evidence of good interpersonal skills when working with patients, families and other members of the health care team.
2.2.4 An awareness of the unique personal, psychosocial, cultural and ethical issues that surround individual patients with obstetric problems.

2.2.5 The ability to prepare and present information to colleagues and other trainees (if applicable) both informally (e.g. ward rounds) and formally (e.g. Grand Rounds, scientific meetings)

2.2.6 The ability to provide information to the general public and media about areas of local concern relevant to the practice of maternal fetal medicine.

*The MFM resident will enhance themselves within these objectives by:*

- Being responsible for preparing and presenting one high-risk rounds.
- The resident will conduct, record and dictate consultations on complex maternal fetal medicine referrals, which are reviewed by the attending consultant for accuracy, legibility and completeness.

3. **COLLABORATOR**

3.1 **General Objectives**

The fully trained obstetrician and gynecologist must be able to:

- Consult effectively with other physicians
- Consult effectively with other health care providers
- Contribute effectively to a multidisciplinary health care team

3.2 **Specific Objectives**

To achieve these objectives as a collaborator, the MFM resident must be able to:

3.2.1 Function competently in the initial management of patients with conditions that fall within the realm of other medical or surgical specialties

3.2.2 Demonstrate the ability to function effectively and where appropriate, provide leadership, in a multidisciplinary health care team, showing respect, consideration and acceptance of other team members and their opinions while contributing personal specialty-specific expertise.

3.2.3 Identify and understand and respect the significant roles, expertise, and limitations of other members of a multidisciplinary team required to optimally achieve a goal related to patient care, medical research, medical education or administration.
4. **LEADER**

4.1 **General Objectives**

The fully trained obstetrician and gynecologist should be able to:

- Manage resources effectively to balance patient care, learning needs and outside activities
- Allocate finite health care resources wisely
- Work effectively and efficiently in a health care organization
- Utilize information technology to optimize patient care, life-long learning and practice administration

4.2 **Specific Objectives**

To achieve these objectives as a manager, the MFM resident should:

4.2.1 Be able to effectively manage a clinical practice, including the follow up of normal and abnormal test results and triage of emergency problems
4.2.2 Demonstrate an understanding of the principles of quality assurance in the practice of obstetrics
4.2.3 Demonstrate an understanding of population-based approaches to the provision of medical care, including the costs and benefits of the various screening tests available for prenatal diagnosis.
4.2.4 Demonstrate an understanding of how health care governance influences patient care, research and educational activities at the local, provincial and national level.
4.2.5 Be able to function effectively in local, regional and national specialty associations (professional or scientific) to promote better health care for women.

5. **HEALTH ADVOCATE**

5.1 **General Objectives**

The fully trained obstetrician and gynecologist will:

- Identify the important determinants of health affecting patients
- Contribute effectively to improved health of patients and communities
- Recognize and respond to those issues where advocacy is appropriate

5.2 **Specific Objectives**

In order to achieve these objectives as an advocate, the MFM resident should be able to:

5.2.1 Identify the important determinants of health for an individual patient, highlight which determinants are modifiable, and adapt the treatment approach accordingly
5.2.2 Make clinical decisions for an individual patient, when necessary balancing her needs against the needs of the general population and against the available resources
5.2.3 Participation in the transfer of high risk pregnant women to centres with the appropriate level of care for their particular needs and those of the fetus

5.2.4 Facilitate medical care for patients even when that care is not provided personally or locally or when that care is not readily accessible (e.g. therapeutic abortion)

5.2.5 Advise patients about the local and regional resources available for support, education and rehabilitation

5.2.6 Provide direction to hospital administration regarding compliance with national clinical and surgical practice guidelines

5.2.7 Discuss the function and role of various professional organizations, including the Society of Obstetricians and Gynecologists of Canada (SOGC) in the support of obstetricians and gynecologists in this country and in the provision and maintenance of optimal health care for Canadian women

6. **SCHOLAR**

6.1 **General Objectives**

The fully trained obstetrician and gynecologist must:

- Develop, implement, and monitor a personal continuing education strategy
- Be able to critically appraise sources of medical information
- Facilitate patient and peer education
- Try to contribute to the development of new knowledge in the field of obstetrics and gynecology

6.2 **Specific Objectives**

In order to achieve these general objectives as a scholar, the MFM resident must:

6.2.1 Develop a habit of life-long learning, utilizing information technology for referencing cases, literature review and participation in basic or applied clinical research

6.2.2 Identify gaps in personal knowledge and skill and develop strategies to correct them by self-directed reading, discussion with colleagues and ongoing procedural experience

6.2.3 Understand the principles of basic and applied clinical research, including biostatistics

6.2.4 Be able to critically appraise and summarize the literature on a given subject and judge whether a research project or publication is sound, ethical, unbiased and clinically valuable

*The MFM resident will enhance their competencies in these areas by:*

- **Participate in the obstetrical residency program Journal Club**
7. **PROFESSIONAL**

7.1 **General Objectives**

The fully trained obstetrician and gynecologist must:

- Deliver the highest quality of medical care with integrity, honesty, compassion and respect
- Exhibit appropriate personal and interpersonal professional behaviors
- Practice medicine in a way that is consistent with the ethical obligations of a physician

7.2 **Specific Objectives**

In order to achieve these general objectives in the role of a professional, the MFM resident must:

7.2.1 Foster a caring, compassionate and respectful attitude towards patients, families and other members of the health care team.
7.2.2 Provide medical care that is ethical, and seek advice or second opinion appropriately in ethically difficult situations
7.2.3 Monitor patients appropriately and provide appropriate follow up medical care, particularly after starting a new treatment or following a surgical procedure
7.2.4 Maintain patient confidentiality at all times
7.2.5 Complete reports, letters and summaries in a timely fashion and maintain medical records that are consistently accurate, informative and legible.
7.2.6 Understand medical protective procedures and the role of the Canadian Medical Protective Association in areas of patient-physician dispute
7.2.7 Be able to deal with professional intimidation and harassment
7.2.8 Show self-discipline, responsibility and punctuality in attending to ward duties, in the operating room, and at meetings and other activities, and be a moral and ethical role model for others
7.2.9 Be able to appropriately delegate clinical and administrative responsibilities
7.2.10 Have the ability to balance professional and personal life

The MFM resident will be assessed in these areas via patient, nursing staff, consultant staff and support staff assessments.
OBJECTIVES OF TRAINING AND SPECIALTY REQUIREMENTS
IN MATERNAL FETAL MEDICINE (INCLUDING ULTRASOUND)

SECTION HEAD: DR. G. REID

SECTION MEMBERS: DR. C. BURYM
DR. S. MENTICOGLOU
DR. C. SCHNEIDER

At the completion of the three-month rotation in the Fetal Assessment Unit, the resident should be familiar with/able to have completed:

1. **Specified Reading**
   Principles of ultrasound; principles of fetal assessment including biophysical profile scoring; obstetric uses such as dating, placental localization etc.; limitations of obstetric ultrasound (measurements, estimated fetal weight, etc.) and appropriate indications for BPS, MS-AFP and genetic amniocentesis.

2. **Practical Objectives**
   - Differentiate the viable fetus from an IUD
   - Confirm presentation – breech, vertex, transverse lie
   - Differentiate single from multiple pregnancy
   - Recognize abnormalities of amniotic fluid volume (AFV)
   - Identify fundal placenta and other placental locations
   - Perform amniocentesis under supervision
   - Identify fetal biophysical variables
   - Identify normal structural anatomy
   - Have observed an Rh IUT or IVT, if applicable.

NOTE: All scans must first be observed in the first instance and then performed under direct supervision by R.N. or M.D. in the unit. Fetal measurements must be performed by regular unit staff although if time permits, there is no contraindication to the resident becoming familiar with this type of examination.

3. **Evaluation**
   A satisfactory rotation will include the completion of assigned reading, the assigned question and the opinion of a division member who has supervised the major part of the residents’ practical work and interpretation of findings.

At the completion of a satisfactory evaluation the resident will be considered eligible to perform “emergency” obstetric scans on the labour and delivery units of the two tertiary centres in the following selected circumstances.

1. The attending physician has assessed the patient on L & D.
2. The resident has contacted the divisional on-call member to discuss the specific indications for the scan.
3. The resident is familiar with and has used the equipment, which is available for the L & D scan.
4. The following information is sought:
   i) singleton or multiple
   ii) alive or deceased
   iii) presentation
   iv) unequivocal fundal placental

5. At the conclusion of the scan the resident will discuss the findings with the division member prior to charting the results or conveying the information to the attending physician.

   Apparent abnormalities of AFV, estimated fetal weight, measurements, placental localization, the exclusion of congenital abnormalities, and assessment of fetal condition in relation to fetal distress or management decisions must be referred to the division staff member or senior fellow on-call.

**Assigned Reading**


