

## INTRODUCTION:

Expertise in the management of “medical complications of pregnancy” (otherwise known as Obstetric Medicine) is an expectation for trainees completing residency training in Internal Medicine in Canada, as outlined in the Objectives of Training and Specialty Training Requirements in Internal Medicine of the Royal College of Physicians and Surgeons of Canada. This objective is meant to be achieved despite the lack of a formal or standardized national framework for training in obstetric medicine, along with infrequent and regionally variable clinical experience in caring for pregnant women with medical disorders. The great majority of Internal Medicine residents will not have received any systematic instruction about the assessment and management of medical problems in pregnancy, thereby failing to link the curriculum to certification requirements and health care needs, as advocated by experts in curriculum design. A recent survey of Canadian graduates of General Internal Medicine residencies confirmed that obstetric medicine is one of the areas within the CanMEDS competencies which showed the greatest perceived gap between importance (high) and preparation (low) among new specialist physicians (Card *et al.*, 2006). In response to similar concerns in other countries, the International Society of Obstetric Medicine (ISOM) recently began a process to: outline the body of knowledge in Internal Medicine of particular relevance to pregnancy, identify specific conditions unique to pregnancy, and to define the context in which training in this knowledge should occur.

Recognizing the abundance of talented obstetric medicine physicians in Canada, as well as the unique scope of practice of training and in General Internal Medicine in this country, a national curriculum validation project was undertaken to synthesize a comprehensive Obstetric Medicine Curriculum for training of specialty residents in Canada. This document is the product of that process.

This Canadian Obstetric Medicine Curriculum is a summary of the attitudes, abilities and knowledge which should be imparted to Canadian Internal Medicine trainees in the domain of Obstetric Medicine. The information is organized in three sections: general principles, competencies specific to each organ system and tabular data. The competencies are presented in CanMeds format. The curriculum document may serve as a blueprint for the creation of curricular objectives, may guide the selection of appropriate instructional strategies, and may stimulate the development of valid alternative educational strategies (ie. for rare conditions) and assessment methods. It may also assist in defining the context in which training should occur, and serve as a model for local curricula adapted to the level of the trainees involved.

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## CanCOM Obstetric Medicine Curriculum

This table describes the competencies required to practice Obstetric Medicine. The content of this curriculum blueprint is based on several sources including the curriculum endorsed by the International Society of Obstetric Medicine, validated by subject-matter experts across Canada, and adapted to reflect the educational standards of the Royal College of Physicians and Surgeons of Canada.

### SECTION 1: GENERAL PRINCIPLES

#### 1. CanMEDS COMPETENCIES FOR OBSTETRIC MEDICINE

##### 1.0 Medical Expert

Medical expert is the central role and refers to the application of medical knowledge, clinical and professional skills. This role will be developed for each discipline under section 2.

##### 1.1 Communicator

###### 1.1.1 CONCEPTS:

**Establishes effective rapport, trust and ethical therapeutic relationships with:**

Patient and family

Multidisciplinary team and allied health professionals

**Accurately obtains, synthesizes and conveys relevant data from:**

Patient, family, colleagues and other professionals

**Develops a common understanding on issues, problems and plans with:**

Patient, family and multidisciplinary team

**Provides accurate and sensitive information:**

During preconception counseling of women with chronic medical disorders

On risk:benefit profile of medication use in pregnancy and breastfeeding

On risk:benefit of various diagnostic and therapeutic options in pregnancy

On the need to discuss the reliability of information obtained from the internet

##### 1.2 Collaborator

###### 1.2.1 CONCEPTS

**Consults effectively with inter-professional healthcare team**

**Understands and respects the role of each healthcare provider**

**Contributes effectively to other interdisciplinary activities and meetings**

**Facilitates care and coordination of follow-up during the pregnancy and post-partum**

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### 1.3 Manager

#### 1.3.1 CONCEPTS:

Organizes investigations within an acceptable time frame, taking into consideration the availability of resources

Works efficiently within a health care organization

### 1.4 Health advocate

#### 1.4.1 CONCEPTS:

Provides accurate and sensitive counseling on:

Impact of smoking, alcohol, and recreational drugs on health of mother and fetus

Tools available in pregnancy for a healthier lifestyle

Psychological impact of a complicated pregnancy on mother and family

Promotes preventive health care in the setting of preconception care, pregnancy and the post-partum

Responds to the individual patient's and community health needs

### 1.5 Scholar

#### 1.5.1 CONCEPTS:

Seeks and critically appraises medical information to answer clinical questions

Facilitates learning of patients, families, and other health professionals

Demonstrates leadership in the development of appropriate protocols for care, when possible

Consults available resources for medication risk-benefit profile in pregnancy and lactation

### 1.6 Professional

#### 1.6.1 CONCEPTS:

Demonstrates commitment to patients and profession through an ethical practice

Recognizes the predominant ethical dilemmas in Obstetric Medicine

Delivers quality care with integrity and compassion

Recognizes limitation in knowledge and skills, and appropriately consults another health professional in:

Caring for patients with rare or complex medical conditions (for example: cancer, transplant, obstetric complications)

## 2. PHYSIOLOGY OF PREGNANCY

### 2.1 Cardiovascular changes

#### 2.1.1 CONCEPTS:

Demonstrates applied knowledge of the:

Impact of pregnancy on blood volume, vascular resistance, and cardiac output

Impact of normal hemodynamic changes on symptomatology, physical findings and laboratory parameters (table I)

Hemodynamic changes associated with labor, delivery, and the postpartum period

**2.2 Respiratory physiology**

## 2.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of pregnancy on respiratory rate, lung volumes and normal symptomatology

Impact of pregnancy on sleep quality, architecture, and time

**2.3 Renal physiology**

## 2.3.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of the increase in renal blood flow on kidney size and function (table I)

Changes in renal collecting system due to hormonal and mechanical factors

Impact of pregnancy on renal tubular function and findings on urinalysis

Impact of placental vasopressinase on ADH metabolism

**2.4 Metabolic changes**

## 2.4.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Normal metabolic and endocrine changes associated with pregnancy

Impact of placental hormones on maternal glucose and lipid metabolism

Relative insulin resistance and hypercortisolism associated with pregnancy

**3. PHARMACOLOGY OF PREGNANCY AND LACTATION****3.1 General principles**

## 3.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Background risks of congenital anomalies, spontaneous abortion, and fetal complications

Etiologies related to congenital anomalies

Notion of critical period for anomalies specific to each organ system

Importance of antenatal counseling to reduce risk of congenital anomalies

Impact of pregnancy on drug pharmacodynamics

Factors that affect drug transfer into breast milk

Drugs that influence milk supply

Importance of an evidence-based approach when communicating risks and benefits of a pharmacotherapeutic agent with a patient

**4. DIAGNOSTIC AND THERAPEUTIC RADIATION IN PREGNANCY****4.1 Diagnostic imaging**

## 4.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Potential impact of fetal radiation exposure according to timing during pregnancy

Expected fetal radiation exposure associated with common radiological examinations (refer to table II)

Approach to imaging with intravenous contrast agents or radiopharmaceuticals during breastfeeding

**4.2. Therapeutic radiation**

## 4.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Risk:benefit of radiation therapy during each trimester of pregnancy

**5. ACUTE CARE AND MATERNAL RESUSCITATION****5.1 Acute respiratory failure**

## 5.1.1 CONCEPTS:

**Demonstrates understanding of:**

Expected changes in blood gas parameters associated with pregnancy

Impact of pregnancy and medications on risk of pulmonary edema

## 5.1.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Impact of pregnancy on approach to intubation

Risk of mucosal friability associated with nasal intubation

Appropriate investigation and treatment of the pregnant patient with acute shortness of breath

Target pO<sub>2</sub> and pCO<sub>2</sub> in the intubated pregnant patient

Indications for ICU consultation and assisted ventilation

## 5.1.3 COMPLICATIONS:

**Demonstrates applied knowledge of the:**

Risk of maternal complications associated with inadequate ventilator parameters

Impact of position, hypovolemia and alkalosis on uteroplacental flow

**5.2 Cardiopulmonary resuscitation**

## 5.2.1 CONCEPTS:

**Demonstrates applied knowledge of:**

The impact of pregnancy on mucosal friability and chest compliance

The impact of aortocaval compression on venous return and effectiveness of resuscitation efforts

### 5.2.2 MANAGEMENT:

#### **Demonstrates applied knowledge of:**

ACLS in pregnancy including left lateral displacement of the uterus, early intubation, use and placement of adhesive pads for defibrillation, and removal of fetal monitor to avoid electrical arcing

The role of caesarian delivery after 4 minutes of unsuccessful resuscitation for cardiac arrest in a patient at 20-24 weeks gestation or more

The coordination of care in the ICU setting and the importance of glycemic control and thromboprophylaxis

## 6. SURGICAL AND ANAESTHETIC CONSIDERATIONS

### 6.2 General principals

#### 6.2.1 CONCEPTS:

#### **Demonstrates understanding of the:**

Most common indications for surgery and ideal timing for surgical intervention in pregnancy

Impact of pregnancy on presentation of acute abdomen

Variety of anaesthetic approaches and impact on maternal physiology

Maternal and fetal risks associated with various surgical and anesthetic procedures in pregnancy

Impact of the pregnancy on risk of hypoxemia, aspiration and intubation

#### 6.2.2 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Indications for thrombotic and antibiotic prophylaxis

Specific maternal and fetal considerations such as volume replacement, positioning, and monitoring

## 7. RELEVANT OBSTETRIC AND GYNECOLOGIC CONDITIONS

### 7.1 Septic pelvic vein thrombosis

#### 7.1.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Typical presentation, risk factors, and types of septic thrombosis

Associated risk of pulmonary embolism or regional extension

#### 7.1.2 EVALUATION:

#### **Demonstrates applied knowledge of the:**

Approaches to diagnosis

#### 7.1.3 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Therapeutic modalities

**7.2 Amniotic fluid embolism**

## 7.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Major clinical findings in AFE

Hemodynamic alterations associated with AFE

## 7.2.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Supportive measures taken to correct hypoxemia and hypotension

**7.3 Endometritis**

## 7.3.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Prevalence and risk factors for endometritis in the postpartum period

Differential diagnosis of fever in the postpartum

Prevalence of polymicrobial infection with sexually transmitted infections

## 7.3.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Usual approach to treatment

## 7.3.3 COMPLICATIONS:

Possibility of lethal toxic-shock syndrome associated with rare Clostridial infections

**7.4 Postpartum hemorrhage**

## 7.4.1 CONCEPTS:

**Demonstrates an understanding of:**

Most common causes of early and delayed PPH

## 7.4.2 EVALUATION:

**Demonstrates applied knowledge of the:**

Circumstances in which medical etiologies or contributing factors should be sought

## 7.4.3 MANAGEMENT:

**Demonstrates an understanding of the:**

Sequence of non-operative and operative interventions for the treatment of PPH

**7.5 Assisted reproduction technology (ART)**

## 7.5.1 CONCEPTS:

**Demonstrates an understanding of the:**

Variety of options available to patients with fertility problems

Obstetrical and medical complications associated with ART

Risk factors and classification of ovarian hyperstimulation syndrome (OHSS)

7.5.2 MANAGEMENT:	
<b>Demonstrates an understanding of the:</b>	
Indications for thromboprophylaxis in OHSS	
Treatment modalities for OHSS	
7.5.3 COMPLICATIONS:	
<b>Demonstrates an understanding of the:</b>	
Complications associated with ART and grade III OHSS	
<b>SECTION 2: SPECIFIC DISORDERS</b>	
<b>8.HYPERTENSIVE DISORDERS</b>	
<b>8.1. Chronic hypertension</b>	
8.1.1 EVALUATION:	
<b>Demonstrates applied knowledge of the:</b>	
Baseline investigations to be done prior to or at the onset of pregnancy in a woman with hypertension	
Work-up of secondary causes of hypertension as it pertains to pregnancy	
Physiologic changes to BP in pregnancy	
Associated conditions that may alter BP targets, and related complications	
<b>Demonstrates skills in the:</b>	
Appropriate approach to BP measurement in the pregnant woman	
8.1.2 MANAGEMENT:	
<b>Demonstrates applied knowledge of the:</b>	
Current national guidelines on the management of hypertensive disorders in pregnancy	
Safety profile of antihypertensive medications during pregnancy and breastfeeding	
Approach to BP control and indications for drug therapy	
Appropriate antenatal and post-partum follow-up of hypertensive women	
Strategies to reduce the risk of preeclampsia	
Laboratory investigations for diagnosis of preeclampsia	
<b>Demonstrates appreciation of the:</b>	
Role played by uteroplacental doppler ultrasound in obstetrical management	
8.1.3 COMPLICATIONS:	
<b>Demonstrates competency in:</b>	
Counseling mothers regarding the risk of maternal complications	
<b>Demonstrates understanding of the:</b>	
Fetal complications associated with maternal chronic hypertension	

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<p><b>Accurately educates the mother on the:</b></p> <p>Symptoms and signs of preeclampsia</p>
<p><b>8.2 Gestational hypertension / Preeclampsia</b></p> <p>8.2.1 EVALUATION:</p> <p><b>Demonstrates applied knowledge of the:</b></p> <p>Definitions based on latest Canadian consensus guidelines</p> <p>Pathophysiology of preeclampsia</p> <p>Risk factors that place women at a higher risk of preeclampsia</p> <p>Definition of significant proteinuria in pregnancy</p> <p>Differential diagnosis of atypical preeclampsia</p>
<p>8.2.2 MANAGEMENT:</p> <p><b>Demonstrates applied knowledge of the:</b></p> <p>Appropriate investigations and follow-up of women with suspected preeclampsia</p> <p>Maternal indications for therapy and hospitalization</p> <p>Appropriate recognition and management of severe hypertension</p> <p>Adequate management of peripartum fluid balance</p> <p><b>Appropriately collaborates in the:</b></p> <p>Multidisciplinary discussion around optimal timing for delivery</p>
<p>8.2.3 COMPLICATIONS:</p> <p><b>Demonstrates applied knowledge in the:</b></p> <p>Appropriate recognition and management of associated major maternal complications including HELLP syndrome, DIC, acute renal failure, hypertensive encephalopathy, pulmonary edema, eclampsia and other related medical emergencies</p> <p><b>Develops an understanding of the:</b></p> <p>Indications for MgSO<sub>4</sub> use in the prevention and treatment of eclampsia</p>
<p>8.2.4 POSTPARTUM MANAGEMENT:</p> <p><b>Demonstrates applied knowledge of the:</b></p> <p>Post-partum evolution of BP in preeclampsia</p> <p>Natural evolution and appropriate follow-up of laboratory abnormalities postpartum</p> <p>Indications for investigation of thrombotic predisposition</p> <p><b>Provides accurate and sensitive counseling on the:</b></p> <p>Risk of recurrence of preeclampsia in future pregnancies</p> <p>Association between placental disorders and increased risk of long-term metabolic, renal and cardiovascular disease</p> <p>Strategies including lifestyle modifications and regular follow-up to reduce risk of metabolic and cardiovascular disease</p> <p><b>Seeks and critically evaluates data on the:</b></p> <p>Prevention of preeclampsia in subsequent pregnancies</p>

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**9. CARDIOLOGY****9.1 Evaluation of palpitations, presyncope and syncope**

## 9.1.1 EVALUATION:

**Demonstrates skills in the:**

Performance of a physical examination of the cardiovascular system of the pregnant woman

**Demonstrates applied knowledge of the:**

Appropriate evaluation and investigations for palpitations, presyncope and syncope

## 9.1.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Appropriate treatment of the most prevalent arrhythmias in pregnancy (symptomatic sinus tachycardia, SVT, AF, and atrial flutter)

Presence of an increased risk of arrhythmia, pulmonary edema, hypotension during labour

**Demonstrates appreciation of the:**

Importance of educating mothers on the normal cardiovascular symptoms in pregnancy

**9.2 Acquired and Congenital Heart Disease**

## 9.2.1 CONCEPTS:

**Demonstrates an understanding of the:**

Impact of pregnancy associated hemodynamic changes on different types of congenital and acquired pathologies

Impact of cardiac disease on pregnancy outcome

Features associated with a higher maternal risk

Increased risk of fetal cardiac malformations with family history of cardiac malformations

Various approaches to anticoagulation for prosthetic cardiac valves during pregnancy, labour, and the postpartum

Period of highest risk for warfarin teratogenicity

## 9.2.2. MANAGEMENT:

**Demonstrates applied knowledge of the:**

Role of folic acid for woman with a personal or family history of congenital cardiac anomaly

History, physical examination, and investigations to detect deterioration in cardiac function

Usefulness of a variety of maternal monitoring devices during labour and post-partum period

Management of maternal cardiac complications

Indications for endocarditis prophylaxis

**9.3 Cardiomyopathies**

## 9.3.1 EVALUATION

**Demonstrates understanding of the:**

Risk factors associated with an peripartum cardiomyopathy (PPCM)

Diagnostic features of peripartum cardiomyopathy

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<b>Demonstrates applied knowledge of the:</b>
Differential diagnosis of pulmonary edema in pregnancy
Risk of maternal and fetal complications of acute and chronic heart failure
9.3.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Investigations for the evaluation of heart failure
Cardiac medications acceptable for use in pregnancy
Treatment of congestive heart failure in pregnancy
<b>Demonstrates understanding of the:</b>
Impact of cardiac disease on delivery plan
Role of prophylactic anticoagulation in women with a depression LVEF
Possible pathogenic role of prolactin in PPCM
9.3.3 COMPLICATIONS:
<b>Demonstrates appreciation of the:</b>
Risk of recurrence of peripartum cardiomyopathy or deterioration of cardiac function in subsequent pregnancies
Approaches to evaluate and counsel women on the risk of cardiac complications in subsequent pregnancies
<b>10. ENDOCRINOLOGY</b>
<b>10.1 Pregestational diabetes</b>
10.1.1 EVALUATION:
<b>Demonstrates applied knowledge of the:</b>
Preconception and baseline evaluation of glycemic control, medication use, and history of severe complications
Adjustment of medications in preparation for pregnancy
Preconception target in HbA1C and impact on risk of miscarriages and fetal malformations
Evaluation of target organ damage at baseline and during the course of pregnancy
Evaluation of comorbidities associated with type 1 and 2 diabetes
Importance of preconceptional folic acid use at an appropriate dose
<b>Provides accurate and sensitive counseling on the:</b>
Risk of maternal complications such as hypoglycemic and hyperglycemic episodes, DKA, progressive retinopathy and nephropathy, preeclampsia
10.1.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Treatment modalities in pregnancy and targets for glycemic control
Expected changes in insulin requirements during the course of pregnancy, following steroid administration and the early post-partum period
Management of diabetes during labor and the postpartum period

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10.1.3 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Management of maternal complications
<b>Demonstrates understanding of the:</b>
Impact of poor glycemic control on fetus, neonate and longer term risk of metabolic disease
Possible impact of valsalva maneuvers during delivery on severe retinopathy
<b>10.2 Gestational diabetes</b>
10.2.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Pathophysiology of insulin resistance in pregnancy
Risk factors for gestational diabetes
<b>Demonstrates appreciation of the:</b>
Contribution of cultural and religious background to diet and lifestyle habits
10.2.2 SCREENING:
<b>Demonstrates applied knowledge of the:</b>
Canadian Diabetes Association guidelines for impaired glucose tolerance and gestational diabetes
<b>Demonstrates understanding of the:</b>
Indications for early screening, usual screening and repeat screening
Optimal timing for screening for high risk populations
10.2.3 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Baseline assessment at time of diagnosis of GDM
Contribution of a consultation with dietitian and exercise therapist
Nature of follow-up and targets for glycemic control
Non-pharmacological approach to glycemic control
Indications to start pharmacological therapy
Risks and benefits of selected medications
Recommendations for postpartum follow-up
10.2.4 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Associated risk of gestational hypertension
Long-term risk of type 2 DM
Risk of occurrence in subsequent pregnancies
<b>Demonstrates understanding of the:</b>
Obstetric and delivery complications associated with untreated gestational diabetes

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<b>Counsels on the:</b>
Lifelong risk of obesity, diabetes and other adverse maternal outcomes
Importance of early screening before and during a next pregnancy
<b>Promotes health by explaining:</b>
Required lifestyle changes and optimal follow-up of other cardiovascular risk markers
<b>10.3 Obesity and metabolic syndrome</b>
10.3.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Impact of obesity on insulin resistance, oxygen demand, and cardiac work
Associated risk of aspiration, sleep disorders, and restrictive lung disease
Appropriate pre-conception counseling
<b>Demonstrates accurate and sensitive counseling on:</b>
Appropriate nutrition and weight gain during pregnancy
10.3.2 EVALUATION:
<b>Demonstrates applied knowledge of the:</b>
Importance of early screening for GDM
Approach to the patient with prior bariatric surgery according to type of intervention
10.3.3 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Appropriate follow-up for placental-mediated disorders and other complications
10.3.4 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Risk of adverse fetal and maternal outcomes during pregnancy and delivery
<b>10.4 Thyroid disorders</b>
10.4.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Normal variations of TSH and T4 levels in pregnancy
Differential diagnosis of hypothyroidism in pregnancy
Differential diagnosis of hyperthyroidism in pregnancy
Impact of pregnancy on Grave's disease
Link between abnormal thyroid results, hyperemesis gravidarum, and molar pregnancy
Interaction between iron, calcium and levo-thyroxine absorption
<b>Provides accurate and sensitive counseling on the:</b>
Possible association between inadequately treated hypothyroidism and cognitive deficits in the newborn

10.4.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Possible need for increased thyroid replacement therapy at onset and during pregnancy
Appropriate follow-up of TSH, T4 and goals of therapy
Treatment choices for hyperthyroidism in pregnancy and breastfeeding
Options for follow-up and adjustment of thyroid replacement therapy after delivery
10.4.3 COMPLICATIONS:
<b>Demonstrates understanding of the:</b>
Link between thyroid disorders and obstetrical complications
Benefits of treating subclinical and frank hypothyroidism on maternal and fetal outcomes
<b>Demonstrates applied knowledge of the:</b>
Recognition and management of post-partum thyroiditis
Recognition and management of thyroid storm in pregnancy and the peripartum period
<b>Demonstrates understanding of the:</b>
Options for fetal surveillance when maternal TSI antibodies present in high titer
<b>10.5 Pituitary disorders</b>
10.5.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Return of fertility after treatment of prolactinomas
Impact of pregnancy on prolactinoma size
Variability in presentation of Sheehan syndrome in the post-partum period
Importance of considering mild hypopituitarism in women with difficulty lactating
10.5.2 EVALUATION:
<b>Demonstrates applied knowledge of the:</b>
Possibility of hypopituitarism in the patient with severe post-partum hemorrhage and ongoing hypotension
10.5.3 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Management of prolactinoma during pregnancy, the preconception period and during lactation
10.5.4 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Clinical presentation of an increase in prolactinoma size
Typical presentation of pituitary apoplexy

**10.6 Adrenal disorders**

## 10.6.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of pregnancy on clinical presentation of Cushing's syndrome

## 10.6.2 EVALUATION:

**Demonstrates applied knowledge of the:**

Approach to diagnosis of Cushing's syndrome in pregnancy

## 10.6.3 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Therapeutic options for the treatment of Cushing's syndrome in pregnancy

Indications for stress dose steroids at the time of delivery

## 10.6.4 COMPLICATIONS:

**Demonstrates applied knowledge of the:**

High rate of complications associated with untreated Cushing's syndrome in pregnancy

**10.7 Diabetes insipidus**

## 10.7.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Changes in ADH physiology in pregnancy

Typical presentation of gestational DI

Different etiologies and associations of DI in pregnancy

## 10.7.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Therapeutic options for DI in pregnancy

**11. HEMATOLOGY****11.1 Anemia**

## 11.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of anemia in pregnancy

## 11.1.2 EVALUATION:

**Demonstrates applied knowledge of the:**

Diagnostic value of serum ferritin

## 11.1.3 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Treatment of iron-deficiency in pregnancy and indications for parenteral iron therapy

## 11.2 Thromboembolic disorders

### 11.2.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Thromboembolic predisposition associated with pregnancy and the early post-partum period

Additional factors which increase risk of venous thromboembolism

Mortality associated with thromboembolic disorders

Interpretation of d-dimers in pregnancy

### 11.2.2 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Appropriate investigations for VTE

Management of VTE in pregnancy, labour, and the post-partum period

Approaches for monitoring laboratory markers of anticoagulation

#### **Demonstrates understanding of the:**

Indications for thromboprophylaxis in pregnancy and the post-partum period

Impact of anticoagulation on anaesthetic and obstetric management at the time of delivery

### 11.2.3 COMPLICATIONS

#### **Demonstrates applied knowledge of the:**

Maternal and fetal complications associated with anticoagulation therapy

## 11.3 Thrombophilias

### 11.3.1 CONCEPTS:

#### **Demonstrates understanding of the:**

Additional hypercoagulable states and their respective thrombotic risk

Impact of pregnancy on laboratory results of components of the coagulation cascade

#### **Seeks and critically evaluates data on:**

Thrombophilic predispositions and obstetrical complications

### 11.3.2 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Implications of thrombophilic predisposition on management during pregnancy and the post-partum period

Different heparin regimen and their respective indications

## 11.4 Thrombocytopenia

### 11.4.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Differential diagnosis of thrombocytopenia in pregnancy

### 11.4.2 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Risk of bleeding associated with various levels of thrombocytopenia

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Treatment of ITP in pregnancy
<b>Demonstrates understanding of the:</b> Risk of fetal thrombocytopenia associated with maternal ITP
<b>Demonstrates effective collaboration with:</b> Obstetrics and Anaesthesia to plan mode of delivery and regional anesthesia and analgesic choices
<b>11.5 Bleeding disorders</b>
11.5.1 CONCEPTS: <b>Demonstrates applied knowledge of:</b> When investigate with a personal or familial bleeding history
Impact of pregnancy on VWD
11.5.2 MANAGEMENT: <b>Demonstrates applied knowledge of the:</b> Management of VWD in pregnancy and the peripartum period
Indications for transfusion therapy
Management of consumptive coagulopathies
<b>Accurate counsels on the:</b> Risks associated with various blood products
<b>11.6 Hemoglobinopathies</b>
11.6.1 CONCEPTS: <b>Demonstrates applied knowledge of the:</b> Complications associated with sickle cell anemia in pregnancy
Differential diagnosis of a low MCV
<b>Demonstrates appreciation of the:</b> Importance of offering families with hemoglobinopathies a consultation with medical genetics
11.6.2 EVALUATION: <b>Demonstrates understanding of the:</b> Preconception evaluation of the patient with an hemoglobinopathy
11.6.3 MANAGEMENT: <b>Demonstrates understanding of the:</b> Management of sickle cell patients in pregnancy
Acute care of the pregnant patient with a sickle cell crisis or acute chest syndrome
<b>Demonstrates appreciation of the:</b> Importance of multidisciplinary care for patients with sickle cell anemia

**12. RESPIROLOGY****12.1 General principles**

## 12.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of acute shortness of breath in pregnancy, labour and the post-partum period

Appropriate evaluation of respiratory symptoms in pregnancy

Increased prevalence of obstructive sleep apnea in pregnancy

**Demonstrates appreciation of the:**

Impact of physiological changes on exercise tolerance

**12.2 Asthma**

## 12.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Factors which increase risk of asthmatic exacerbation

Impact of asthmatic exacerbation on pregnancy outcome

## 12.2.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Adequate control of asthma in pregnancy and breastfeeding

Management of other frequent causes of respiratory complaints in pregnancy such as allergic and gestational rhinitis

**Promotes health by educating on the:**

Importance of developing a self-management plan

Importance of compliance and of early self-referral for persistent asthmatic symptoms

**12.3 Cystic fibrosis**

## 12.3.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of disease severity on adverse maternal outcomes

**Demonstrates understanding of the:**

Importance of genetic counseling

## 12.3.2 EVALUATION:

**Demonstrates applied knowledge of the:**

Importance of optimal, stable pulmonary function prior to conception

## 12.3.3 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Importance of multidisciplinary care including close follow-up of maternal nutrition and weight gain

Importance of early screening for gestational diabetes

**13. NEPHROLOGY****13.1 Physiological changes**

## 13.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of physiologic changes in morphology

Normal proteinuria, albuminuria and serum creatinine in pregnancy (Table I)

Risk factors for nephrolithiasis and pyelonephritis

**13.2 Acute renal failure**

## 13.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of acute renal failure (ARF) in pregnancy

## 13.2.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Evaluation and management of ARF in pregnancy

Importance of avoiding nephrotoxic medications and considering drug adjustments

## 13.2.3 COMPLICATIONS:

**Demonstrates applied knowledge of the:**

Increased risk of acute tubular necrosis in the context of hypovolemia, preeclampsia and bleeding

**13.3 Chronic renal failure**

## 13.3.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of renal dysfunction on maternal and fetal outcomes

Impact of pregnancy on renal dysfunction

Role of prenatal creatinine clearance in preconception counseling

Risks associated with ACE inhibitors and ARBs in pregnancy

**Demonstrates appreciation of the:**

Importance of prenatal counseling for women with chronic renal failure (CRF)

Modifications to hemodialysis regimens in pregnancy

Role of genetic counseling in inherited renal disorders

## 13.3.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Impact of renal disease on target for BP control

Adequate follow-up of renal function in pregnancy

## 13.3.3 COMPLICATIONS:

**Demonstrates applied knowledge of the:**

Factors associated with a risk of progression to end stage renal failure

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**14. TRANSPLANT MEDICINE****14.1 General principles**

## 14.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Maternal and fetal risks associated with anti-rejection medications and pregnancy

Ideal time delay between transplant and pregnancy

Importance of reviewing vaccination history

## 14.1.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Investigations prior to conception and during pregnancy

Importance of early recognition of rejection

Management of infectious complications such as CMV reactivation

**15. GASTROENTEROLOGY****15.1 Hyperemesis gravidarum**

## 15.1.1 EVALUATION:

**Demonstrates applied knowledge of the:**

Differential diagnosis of nausea in pregnancy

Biochemical anomalies associated with HG

Risk factors for severe HG

**Demonstrates appreciation of the:**

Psychosocial consequences of HG

## 15.1.2 MANAGEMENT:

**Demonstrates understanding of the:**

Indications for hospitalization

Therapeutic approaches including risk and benefits of hyperalimentation

**Demonstrates appreciation of the:**

Value of a multidisciplinary approach with experts in high-risk pregnancy, pharmacy, psychology, social work, and nutrition

## 15.1.3 COMPLICATIONS

**Demonstrates applied knowledge of the:**

Maternal and fetal complications associated with severe HG

**15.2 Dyspepsia**

## 15.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Effects of pregnancy on gastrointestinal physiology

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Differential diagnosis of dyspepsia in pregnancy
<b>Demonstrates appreciation of the:</b>
Impact of dyspepsia during the pregnancy
15.2.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Risk and benefit profile of available non pharmacological and pharmacological treatment modalities
Indications and risks of gastroscopy in pregnancy
<b>15.3 Hepatitis and liver dysfunction in pregnancy</b>
15.3.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Differential diagnosis of abnormal liver enzymes and liver function tests in pregnancy
Impact of pregnancy on prevalence of cholestasis, cholelithiasis, and cholecystitis
<b>Demonstrates understanding of the:</b>
Impact of obstetric cholestasis on maternal and fetal pregnancy outcomes
Morbidity and mortality of acute fatty liver of pregnancy (AFLP)
Association of AFLP with DI and cross-over with preeclampsia and HELLP syndrome
15.3.2 EVALUATION:
<b>Demonstrates applied knowledge of the:</b>
Evaluation of abnormal liver enzymes and liver function tests in pregnancy
<b>Demonstrates understanding of the:</b>
Characteristic presentation of AFLP
15.3.3 MANAGEMENT:
<b>Demonstrates applied knowledge of:</b>
Therapeutic approaches to obstetric cholestasis (OC)
<b>Demonstrates understanding of the:</b>
Role of fetal surveillance in OC and optimal timing for delivery
Management of viral hepatitis in pregnancy
Management of AFLP
Role of LCHAD testing for counseling on risk of recurrence
15.3.4 COMPLICATIONS:
<b>Demonstrates understanding of the:</b>
Maternal and fetal complications associated with maternal hepatitis, cholestasis or hepatic dysfunction
Risk factors associated with fulminant hepatitis in pregnancy
Magnitude of perinatal transmission associated with the different viral hepatitis
Role of active and passive immunization to decrease vertical transmission of hepatitis B
Risk of severe hepatic failure in AFLP and indications for hepatic transplant

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## 15.4 Cirrhosis

### 15.4.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Impact of pregnancy on liver function and portal hypertension

Impact of chronic liver disease on pregnancy

### 15.4.2 EVALUATION:

#### **Demonstrates applied knowledge of the:**

Contribution from upper endoscopy in antenatal counseling

### 15.4.3 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Indications for beta-blocker prophylaxis against variceal hemorrhage

## 15.5 Inflammatory bowel disease

### 15.5.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Importance of stabilizing disease prior to conception

Usual course during pregnancy and the postpartum period

Maternal and fetal complications of IBD exacerbation during pregnancy

#### **Demonstrates appreciation of:**

Importance of prenatal counseling of patients with IBD

### 15.5.2 EVALUATION:

#### **Demonstrates applied knowledge of the:**

Importance to evaluate the presence of extra-intestinal manifestations of IBD

Risk and benefits of endoscopy in pregnancy

### 15.5.3 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Therapeutic approaches to IBD during pregnancy and the post-partum period

Appropriate assessment and management of patients with symptoms of exacerbation

#### **Demonstrates appreciation of the:**

Importance of nutritional counseling

### 15.5.4 COMPLICATIONS

#### **Demonstrates applied knowledge of the:**

Management of complications during pregnancy

Potential for malabsorption of fat soluble vitamins if distal ileal resection

**16. NEUROLOGY****16.1 Headaches**

## 16.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of headache in pregnancy

Natural history of headaches in pregnancy and the post-partum period

Prevalence of post-epidural headaches

**Demonstrates appreciation of the:**

Impact of headaches on quality of life in pregnancy

## 16.1.2 EVALUATION:

**Demonstrates applied knowledge of the:**

Evaluation of headache in pregnancy

Indications for imaging

## 16.1.3 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Non pharmacological management of benign chronic headaches

Safety profile of analgesics and other pharmacologic agents in pregnancy

Management of post-epidural headaches

**16.2 Seizures**

## 16.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of seizures in pregnancy

Factors which modify the risk of seizures in women with epilepsy

Importance of preconception counseling

Impact of antiepileptic drugs on folic acid metabolism

Factors which increase the teratogenic potential of anticonvulsivants

**Demonstrates understanding of the:**

Increased risk of epilepsy in children born to mothers or fathers with epilepsy

**Accurately counsels patients on the:**

Impact of seizures and medications on maternal and fetal pregnancy outcomes

## 16.2.2 MANAGEMENT:

**Demonstrates applied knowledge in:**

Pharmacological and non pharmacological approaches to decrease risk of seizures

Approaches to drug monitoring

Management of acute seizures in pregnancy

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<b>Demonstrates understanding of the:</b> Importance of counseling women regarding the transmission of antiepileptic medications in breast milk, contraception, and safe approaches when caring for neonate
16.2.3 COMPLICATIONS: <b>Demonstrates applied knowledge of the:</b> Increased risk of drug toxicity in first months postpartum
<b>16.3 Cerebrovascular disease</b> 16.3.1 CONCEPTS: <b>Demonstrates applied knowledge of the:</b> Risk factors for stroke in pregnancy Differential diagnosis of hemorrhagic and ischemic stroke in pregnancy Clinical presentations of hypertensive encephalopathy and reversible posterior leukoencephalopathy syndrome
16.3.2 EVALUATION: <b>Demonstrates applied knowledge of the:</b> Diagnostic evaluation of cerebrovascular symptoms in pregnancy
16.3.3 MANAGEMENT: <b>Demonstrates applied knowledge of the:</b> Approach to patient with a history of prior stroke Approach to patient with stroke in pregnancy and the post-partum period
<b>16.4 Nerve compression syndromes</b> 16.4.1 CONCEPTS: <b>Demonstrates applied knowledge of the:</b> Risk factors for nerve compression and entrapment syndromes in pregnancy Time course for symptom resolution in the post-partum period Increased prevalence of Bell's palsy in pregnancy Impact of pregnancy on outcome of Bell's palsy
16.4.2 EVALUATION: <b>Demonstrates applied knowledge of the:</b> Typical presentation of carpal tunnel syndrome (CTS), sciatica and meralgia paraesthetica
16.4.3 MANAGEMENT: <b>Demonstrates applied knowledge of the:</b> Available therapeutic modalities to diminish CTS and sciatica symptoms in pregnancy Indications for treatment of Bell's palsy and available medications in pregnancy
16.4.4 COMPLICATIONS: <b>Demonstrates applied knowledge of the:</b> Possible association of Bell's palsy with pre-eclampsia

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## 16.5 Myasthenia gravis

### 16.5.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Factors associated with the highest risk for MG exacerbation

#### **Demonstrates an understanding of the:**

Impact of MG on fetus development and risk of neonatal MG

Impact of MG on second stage of labour and the importance of planned multidisciplinary care

### 16.5.2 EVALUATION:

#### **Demonstrates applied knowledge of the:**

Baseline evaluation of pregnant patients with MG

### 16.5.3 MANAGEMENT:

#### **Demonstrates applied knowledge of the:**

Necessity to treat infections promptly

Possible for dose adjustment of acetylcholinesterase inhibitors in pregnancy

### 16.5.4 COMPLICATIONS:

#### **Demonstrates applied knowledge of the:**

Initial symptoms associated with a myasthenic crisis

Relative contraindication for use of MGSO<sub>4</sub> in this patient population

First line therapy for antihypertensive treatment in pregnant patients with MG

## 16.6 Multiple sclerosis

### 16.6.1 CONCEPTS:

#### **Demonstrates applied knowledge of the:**

Impact of pregnancy on MS

Impact of MS on pregnancy

Factors which may increase risk of relapse in the post-partum period

### 16.6.2 MANAGEMENT:

#### **Demonstrates understanding of the:**

Management of acute attacks in pregnancy

## 17. INFECTIOUS DISEASES

### 17.1 Infections in general

#### 17.1.1 CONCEPTS:

#### **Demonstrates understanding of the:**

Pathogens associated with an increased risk of obstetric complications (TORCH)

Pathogens associated with an increased risk of maternal morbidity and mortality

Most common causes of sepsis in pregnancy

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17.2.1 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Evaluation and management of the febrile pregnant woman
Management of various antibiotics and antivirals in pregnancy
<b>17.2 Urinary tract infections</b>
17.2.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Factors which increase the risk of urinary tract infections in pregnancy
Predominant causative organisms
17.2.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Most commonly used antibiotic regimens for lower and upper urinary tract infections
Indications for prophylactic regimens
Importance of cultures post treatment to confirm resolution
17.2.3 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Complication associated with untreated asymptomatic bacteriuria
Maternal complications associated with pyelonephritis
<b>17.3 Respiratory infections</b>
17.3.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Differential diagnosis of cough in pregnancy
Importance of measuring oxygen saturation in woman with suspected pneumonia
Morbidity and mortality associated with viral pneumonias in pregnancy
17.3.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Evaluation and management of respiratory infections in pregnancy
17.3.3 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Impact of pregnancy on the risk of a complicated pneumonia

**17.4 Tuberculosis**

## 17.4.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of pregnancy on risk of latent TB reactivation and course of active disease

## 17.4.2 EVALUATION:

**Demonstrates applied knowledge of the:**

Indications for testing of latent tuberculosis in pregnancy

## 17.4.3 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Approach to patient with positive tuberculin skin test in pregnancy

Agents to avoid when treating active tuberculosis

**17.5 Human immunodeficiency virus**

## 17.5.1 CONCEPTS:

**Demonstrates understanding of the:**

Risk of vertical transmission to fetus during pregnancy, delivery, and the postpartum period

Impact of HAART on the risk of vertical transmission

Safety profile and principal side-effects of antiretrovirals

Importance of interdisciplinary management with auxiliary care (social work, dietician, pharmacist)

**Provides accurate and sensitive counseling on the:**

Risk of HIV transmission during breastfeeding

**17.6 Immunizations**

## 17.6.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Guidelines for immunization prior to pregnancy, in pregnancy, and in the post-partum period

Importance of addressing vaccination gaps

Effectiveness of immunization in pregnancy

Types of vaccines and safety profile in pregnancy

**18. IMMUNOLOGIC DISORDERS****18.1 Systemic lupus erythematosus**

## 18.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Impact of SLE on adverse maternal and fetal outcomes

Impact of pregnancy of disease markers

Factors which increase the risk of adverse pregnancy outcomes

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<b>Demonstrates appreciation of the:</b> Importance of prenatal counseling on factors which decrease risk of flare-up during pregnancy
18.1.2 EVALUATION: <b>Demonstrates applied knowledge of the:</b> Baseline assessment of function and disease markers Importance of regular clinical and laboratory follow-up Evaluation of proteinuria and renal dysfunction in these women
18.1.3 MANAGEMENT: <b>Demonstrates applied knowledge of the:</b> Therapeutic options for disease control Impact of early treatment of exacerbations Risk of exacerbation when discontinuing antimalarials
18.1.4 COMPLICATIONS: <b>Demonstrates applied knowledge of the:</b> Manifestations of other complications of SLE in pregnancy <b>Demonstrates understanding of the:</b> Fetal surveillance associated with the presence of anti-SSA and anti-SSB antibodies
<b>18.2 Antiphospholipid syndrome</b> 18.2.1 CONCEPTS: <b>Demonstrates applied knowledge of the:</b> Diagnostic criteria for APLS Impact of APLS on adverse maternal and fetal outcomes Association with other autoimmune disorders
18.2.2 EVALUATION <b>Demonstrates applied knowledge of the:</b> Impact of inter laboratory variations on diagnosis Indications for testing and follow-up
18.2.3 MANAGEMENT <b>Demonstrates applied knowledge of the:</b> Therapeutic approaches in pregnancy <b>Demonstrates understanding of the:</b> Clinical features of catastrophic antiphospholipid syndrome <b>Provides accurate and relevant counseling on the:</b> Possibility of developing non-obstetrical manifestations in the future
<b>18.3 Rheumatoid arthritis</b>

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## 18.3.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of symmetrical and asymmetrical arthritis in pregnancy and the postpartum period

Impact of pregnancy on RA disease activity

Safety profile of RA medications in pregnancy and lactation

**Provides accurate counseling on the:**

Risk of post-partum exacerbation

## 18.3.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Therapeutic approaches in pregnancy and the postpartum period

Available data regarding biologic agents

## 19. NEOPLASTIC DISORDERS

### 19.2 General principles

## 19.2.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Most common types of pregnancy-associated cancers

Impact of pregnancy on the interpretation of cytological specimens

Risk of transplacental metastases

Importance of pre-conception counseling including cardiac evaluation in patients with history of thoracic radiation or anthracyclin therapy

## 19.2.2 MANAGEMENT:

**Demonstrates applied knowledge of the:**

Spectrum of therapeutic options in pregnancy and impact on mother and fetus

Impact of delaying delivery after chemotherapy for fetal bone marrow recovery

## 20. DERMATOLOGY

### 20.1 Dermatoses related to pregnancy

## 20.1.1 CONCEPTS:

**Demonstrates applied knowledge of the:**

Differential diagnosis of pruritus in pregnancy

Differential diagnosis of skin lesions in pregnancy

Usual presentation of PUPPP

**Demonstrates appreciation of the:**

Impact of pruritus on quality of sleep and quality of life

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20.1.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
Therapeutic modalities for the relief of pruritus
Evaluation and management of bullous lesions in pregnancy
20.1.3 COMPLICATIONS:
<b>Demonstrates applied knowledge of the:</b>
Risk of neonatal complications in herpes gestationis
Risk of recurrence of herpes gestationis in future pregnancies or when taking oral contraceptive agents
<b>21. Psychiatric illness</b>
<b>21.1 Chronic psychiatric conditions</b>
21.1.1 CONCEPTS:
<b>Demonstrates understanding of the:</b>
Importance of preconception counseling in women with a history of chronic psychiatric conditions
<b>Demonstrates accurate and empathetic counseling on:</b>
The effect of pregnancy on pre-existing psychiatric illness
The risk benefits of psychiatric medication during pregnancy
<b>Demonstrates appreciation of:</b>
The role of multidisciplinary care with specialists with an expertise in mood disorders
21.1.2 MANAGEMENT:
<b>Demonstrates applied knowledge of the:</b>
How and when to screen for sexual, psychological, and physical abuse
When to contact local psychiatric services
<b>21.2 Acute psychiatric conditions</b>
21.2.1 CONCEPTS:
<b>Demonstrates applied knowledge of the:</b>
Differential diagnosis of psychosis in pregnancy
Risk factors for development of postnatal depression and puerperal psychosis
21.2.2 MANAGEMENT:
<b>Demonstrates understanding of the:</b>
Assessment and treatment of the pregnant patient with psychiatric symptoms
Importance of evaluating for medical or substance abuse comorbidities
Importance of involving psychiatric specialists and family in care of patient

21.2.3 COMPLICATIONS: <b>Demonstrates appreciation of the:</b> Importance of assessing actual suicidal and homicidal risk
<b>21.3 Substance abuse disorders</b>
21.3.1 CONCEPTS: <b>Demonstrates understanding of the:</b> Importance of addressing the possibility of substance abuse objectively and openly with patients Impact of smoking on the pregnancy and fetus Legal implications of substance abuse
21.3.2 MANAGEMENT: <b>Demonstrates competence and empathy in:</b> Discussing safety of different smoking cessation techniques in pregnancy Counseling women about the impact of substance abuse on the pregnancy Importance of referral to a substance abuse disorder clinic <b>Demonstrates applied knowledge of the:</b> Management of acute intoxication and withdrawal in pregnancy Importance of screening for HIV and hepatitis C when relevant Importance of multi-disciplinary care including anaesthesia and neonatology
21.3.3 COMPLICATIONS: <b>Demonstrations applied knowledge in the:</b> Evaluation of symptoms of withdrawal or intoxication
<b>SECTION 3: TABLES</b>

TABLE I: Impact of pregnancy on physical examination, normal laboratory values, and radiological findings

DISCIPLINE	NORMAL FINDINGS IN PREGNANCY	COMMENTS
Physical exam	Decrease in BP by 12 <sup>th</sup> week gestation with return to normal by term	Mean BP decreases by 10-15 mm Hg
	Increase in heart rate by 10-20 beats/min with full brisk bounding pulses	An increase of 10-20%
	Decrease in systemic vascular resistance	Decreased by 25-30%
	Midsystolic ejection flow murmur	Increased volume in outflow tracts
	Two physiologic continuous functional murmurs (mammary and suprasternal hum)	
	Jugular venous distension	Increased

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		intravascular volume
	Lower extremity edema	Increased intravascular volume, IVC compression, decreased oncotic pressure +/- changes in capillary permeability
	Increased respiratory rate from increased minute ventilation	Related to increased drive, basal metabolic rate, and oxygen consumption
	Pulmonary bibasilar rales that open on deep inspiration	Occasionally in late pregnancy
	No significant change in pulmonary artery pressure or pulmonary capillary wedge pressure	
<b>Haematology</b>	Hemoglobin: 100-130 g/L	Physiologic anemia
	Hematocrit	Decreased because plasma volume expansion is greater than increased erythrocyte mass
	Leucocyte count: 10-15 X 10 <sup>9</sup> /L	Increased
	Platelet count: 115-150 X 10 <sup>9</sup> /L in 10% pregnancies	Nadir near term
<b>Coagulation</b>	INR	Unchanged
	PTT	Unchanged
	Fibrinogen: superior to 2.0 g/L	Increased plasminogen activator inhibitors
	D-dimers: less than 300 ug/L	Increased
	vWF factor: group O: 0.40-1.75 U/mL non group O: 0.70-2.10 u/mL	Increased
	Factor VIII: 0.6-1.95 U/L	Other coagulation factors (V, VII, X) also increased by 20-100% by term)
	Protein C: 0.70-1.20 U/mL (antigen)	Usually unchanged
	Protein S: 0.57-1.20 U/mL (antigen)	Decreased
	Antithrombin III: 0.80-1.25 U/mL	Unchanged
	Homocysteine: less than 10 umol/L	Decreased
<b>Renal</b>	Creatinine: 35-44 mmol/L	Decreased

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	Urea	Decreased
	Sodium: 133-135 meq/L	5 meq/L decrease
	Potassium	Unchanged
	Bicarbonate: 18-22meq/L	Decreased
	pH: 7.40-7.45	Respiratory alkalosis
	Uric acid	Decreased
	Plasma osmolality: 270 mosmol/kg	
	24 hour urine protein: up to 300mg	2 fold increase
	Creatinine clearance: 120-160ml/min	2 fold increase by T2
	Renin/angiotensin level	20-40% increase
<b>Hepatic</b>	AST	Unchanged
	ALT	Unchanged
	Total bilirubin	Unchanged
	GGT	Lower in second and third trimester
	Alkaline phosphatase: increased	From placental origin
	Albumine: 30-32mg/L	10-20% decrease in oncotic pressure
<b>Endocrine</b>	TSH: 0.03-2.5 in T1; 0.03-3.0 in T2; 0.03-3.5 in T3	Values may vary according to laboratory assay
	Free T4: levels may be decreased in second half of pregnancy depending on assay used (analog method less reliable than equilibrium dialysis method)	Difficult to measure reliably in setting of elevated TBG
	T3	Unchanged
	Prolactin	Increased up to 10 times normal
	GH	Increased from placental production
	ACTH	Increased from placental production of CRH
	Cortisol	Increased
	Aldosterone	4-6 fold increase by T3
	Angiotensin II	Increased
	ADH	Decreased from increased circulating vasopressinase
	Catecholamines	No change

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<b>Metabolic</b>	Fasting glucose: mean of 4.2	Decreased from active placental transport
	Triglycerides: 2.37 mmol/L	3 fold increase
	Total cholesterol: 6.5 mmol/L	1.5 fold increase
	LDL: 3.8 mmol/L	1.5 fold increase
	HDL: 1.7 mmol/L	1.2 fold increase
	VLDL: 0.65 mmol/L	2.5 fold increase
<b>ABG and pulmonary function tests</b>	PaO <sub>2</sub> increased to 100-105 Hg at sea level	Probably from increased cardiac output; can decrease in supine position
	Increased alveolar-arterial gradient to 20	In late stages of pregnancy
	Mild respiratory alkalosis with decreased PaCO <sub>2</sub> to 28-32 mm Hg	From increased minute ventilation
	HCO <sub>3</sub> decreased to 20-21	Compensatory increase in renal excretion
	pH: 7.40-7.45	Compensated respiratory alkalosis
	Lung volume subdivisions show an increase in tidal volume and a decrease in expiratory reserve volume and residual volume	Decreased FRC with little change in inspiratory capacity
	Decreased lung compliance	From decreased chest wall compliance
	Spirometry is largely unchanged	
<b>CXR</b>	Increased pulmonary vascular markings	Common
	Cardiac silhouette suggestive of cardiomegaly	From heart rotation and hypervolemia
	Straightened left upper cardiac border with more horizontal heart position	
	Small pleural effusion	In post-partum period in particular
<b>EKG</b>	15-20 degree left shift of axis	From elevation of diaphragm
	Periods of SVT and ESV	Occasional
	Q wave in lead III; minor ST-segment depression; T inversion in inferior and lateral leads	From changes in chest dimensions and

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		diaphragm position
<b>Cardiac ultrasound</b>	Physiologic multivalvular regurgitation	Predominantly right-sided
	Chamber enlargement (5-15% increase in chamber size)	Resulting from a 30-50% increase in blood volume
	Small asymptomatic pericardial effusion	Occasionally found in T3; resolve by 6 weeks postpartum
	Increase in cardiac output of 30-60% (5-7 L/min/m <sup>2</sup> )	Combined increase in preload, heart rate and stroke volume

TABLE II: Mean Radiation Exposure to fetus associated with common imaging procedures. Adapted with permission from Table 8-2: Robert L. Barbieri, MD, Medical Care of the Pregnant Patient, 2nd edition. Rosene-Montella K, Keely EJ, Lee RV, Barbour LA, eds. Philadelphia: American College of Physicians; 2007

Procedure	Mean radiation exposure to fetus (mGy)	Comments
Head CT	<0.01	Test of choice for SAH, subdural, epidural or intraparenchymal hemorrhage
Spine CT	<0.01	
Chest CT	0.06	
Abdominal CT	8	
Chest X-ray	<0.01	
Sinus X-ray	<1	
Lumbar spine	1.7	
Abdominal X-ray	1.4	
Mammography	<1 per breast	Less sensitive in pregnancy
Cerebral angiography	Depends on length on fluoroscopy	
Pulmonary angiography	Brachial approach : <0.5 Femoral approach : 2-3	
Cardiac catheterization	5	Ioxaglate as IV contrast reassuring risk profile in animal models
Cerebral MRI	None	Long-term data not yet available; ideal for PRES, cerebral vein thrombosis, pituitary, AVM
Other MRI	None	
Ultrasound	None	
Perfusion-ventilation scan	V: 0.1-0.3 Q: 0.4-0.6	
Cardiac radionuclide imaging	≤8	
IVP	Can be limited to 1.7 Otherwise 2.9-6.8	Concern about iodine toxicity to developing fetal thyroid
Radioactive uptake scanning of the thyroid	Not indicated in pregnancy	Discard milk for 24-48 hours

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